Computer algebra independent integration tests

2-Exponentials/2.3-Exponential-functions

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Contents

Chapter 1

Introduction

This report gives the result of running the computer algebra independent integration problems. The listing of the problems are maintained by and can be downloaded from `https://rulebasedintegration.org`

The number of integrals in this report is [774]. This is test number [55].

1.1 Listing of CAS systems tested

The following systems were tested at this time.

1. Mathematica 12.3 (64 bit) on windows 10.
2. Rubi 4.16.1 in Mathematica 12.1 on windows 10.
3. Maple 2021.1 (64 bit) on windows 10.
4. Maxima 5.44 on Linux. (via sagemath 9.3)
5. Fricas 1.3.7 on Linux (via sagemath 9.3)
6. Giac/Xcas 1.7 on Linux. (via sagemath 9.3)
7. Sympy 1.8 under Python 3.8.8 using Anaconda distribution on Ubuntu.
8. Mupad using Matlab 2021a with Symbolic Math Toolbox Version 8.7 under windows 10 (64 bit)

Maxima, Fricas and Giac/Xcas were called from inside SageMath. This was done using SageMath integrate command by changing the name of the algorithm to use the different CAS systems.

Sympy was called directly using Python.

1.2 Results

Important note: A number of problems in this test suite have no antiderivative in closed form. This means the antiderivative of these integrals can not be expressed in terms of elementary, special functions or `Hypergeometric2F1` functions. `RootSum` and `RootOf` are not allowed.

If a CAS returns the above integral unevaluated within the time limit, then the result is counted as passed and assigned an A grade.

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

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

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

System	solved	Failed
Rubi	% 98.97 (766)	% 1.03 (8)
Mathematica	% 97.03 (751)	% 2.97 (23)
Maple	% 80.23 (621)	% 19.77 (153)
Maxima	% 64.99 (503)	% 35.01 (271)
Fricas	% 89.66 (694)	% 10.34 (80)
Sympy	% 43.28 (335)	% 56.72 (439)
Giac	% 47.80 (370)	% 52.20 (404)
Mupad	% 74.94 (580)	% 25.06 (194)

Table 1.1: Percentage solved for each CAS

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

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

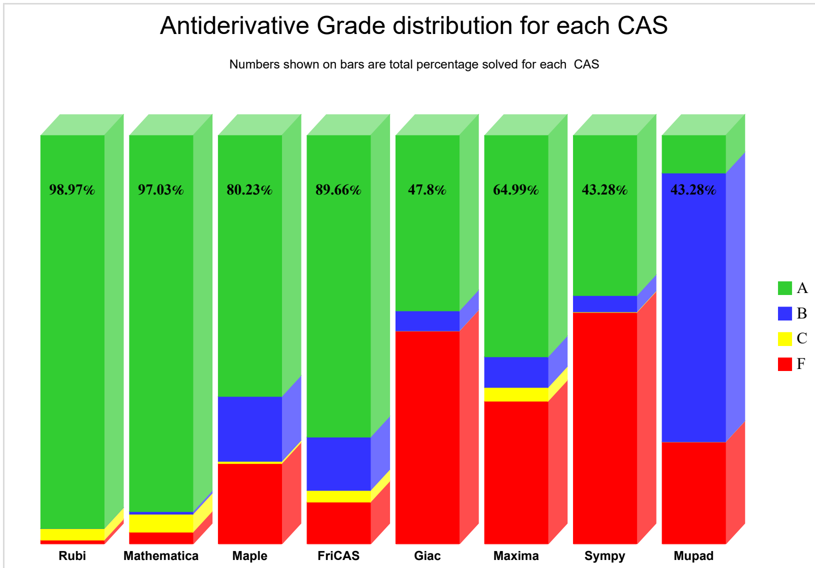
Table 1.2: Description of grading applied to integration result

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

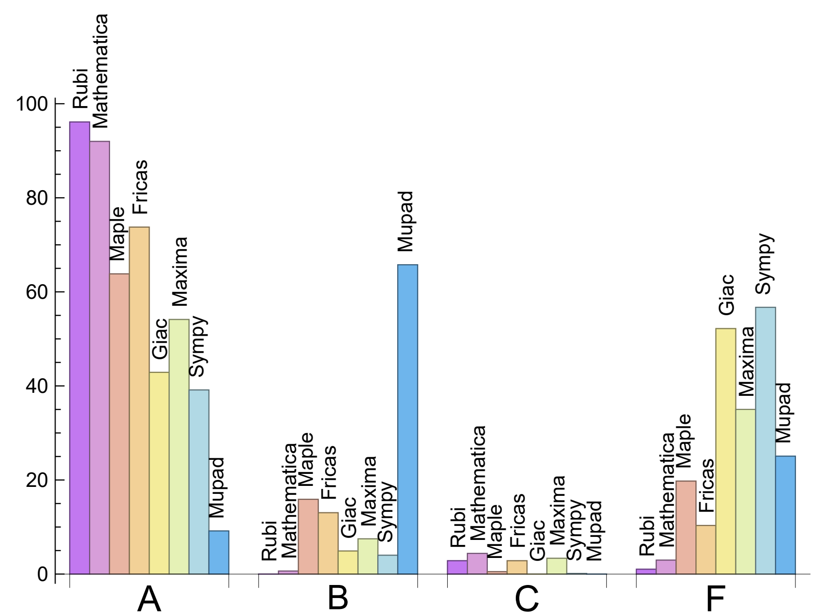
System	% A grade	% B grade	% C grade	% F grade
Rubi	96.12	0.00	2.84	1.03
Mathematica	91.99	0.65	4.39	2.97
Maple	63.82	15.89	0.52	19.77
Maxima	54.13	7.49	3.36	35.01
Fricas	73.77	13.05	2.84	10.34
Sympy	39.15	4.01	0.13	56.72
Giac	42.89	4.91	0.00	52.20
Mupad	9.17	65.76	0.00	25.06

Table 1.3: Antiderivative Grade distribution of each CAS

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



The figure below compares the CAS systems for each grade level.



The following table shows the distribution of the different types of failure for each CAS. There are 3 types of reasons why it can fail. The first is when CAS returns back the input within the time limit, which means it could not solve it. This the typical normal failure **F** .

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

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

System	Number failed	Percentage normal failure	Percentage timeout failure	Percentage exception failure
Rubi	8	100.00 %	0.00 %	0.00 %
Mathematica	23	100.00 %	0.00 %	0.00 %
Maple	153	95.42 %	1.96 %	2.61 %
Maxima	271	91.51 %	0.37 %	8.12 %
Fricas	80	73.75 %	1.25 %	25.00 %
Sympy	439	70.39 %	29.38 %	0.23 %
Giac	404	98.02 %	0.99 %	0.99 %
Mupad	194	100.00 %	0.00 %	0.00 %

Table 1.4: Time and leaf size performance for each CAS

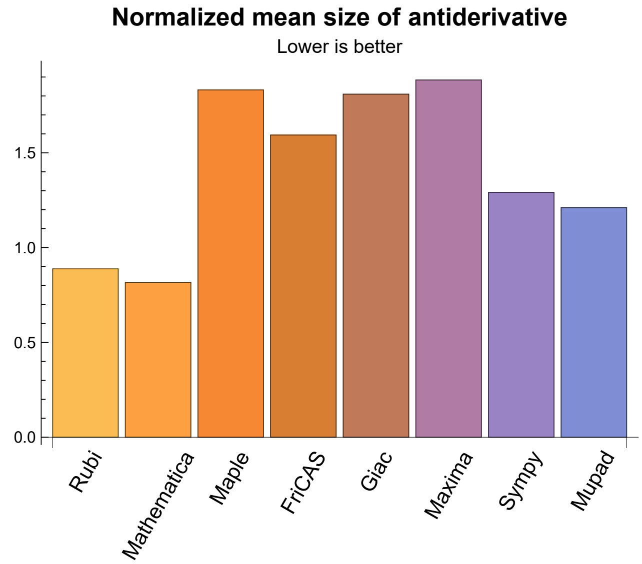
1.3 Performance

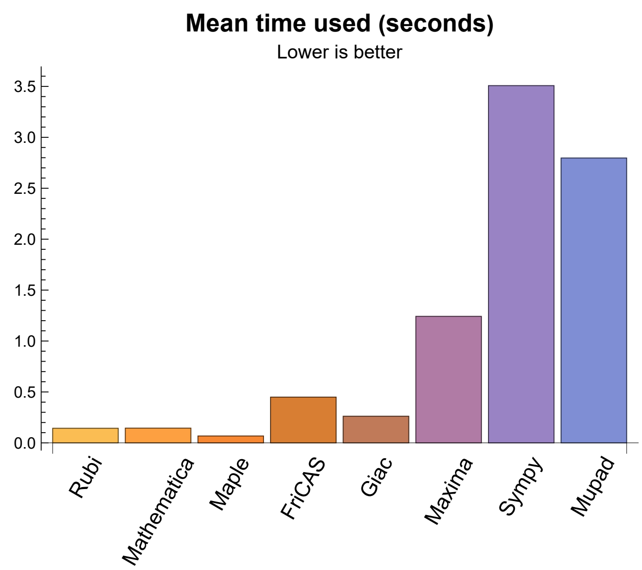
The table below summarizes the performance of each CAS system in terms of CPU time and leaf size of results.

System	Mean time (sec)	Mean size	Normalized mean	Median size	Normalized median
Rubi	0.14	68.28	0.89	41.50	1.00
Mathematica	0.14	60.94	0.82	36.00	0.94
Maple	0.07	137.72	1.83	49.00	1.00
Maxima	1.24	126.42	1.88	24.00	0.83
Fricas	0.45	117.00	1.59	55.00	1.00
Sympy	3.51	72.54	1.29	24.00	0.88
Giac	0.26	104.69	1.81	23.50	0.86
Mupad	2.80	66.44	1.21	37.50	0.91

Table 1.5: Time and leaf size performance for each CAS

The following are bar charts for the normalized leafsize and time used columns from the above table.





1.4 list of integrals that has no closed form antiderivative

{199, 200, 201, 205, 206, 207, 213, 214, 229, 230, 231, 237, 238, 239, 240, 241, 243, 244, 245, 246, 251, 252, 253, 388, 389, 390, 395, 396, 413, 414, 415, 420, 421, 430, 431, 436, 437, 442, 443, 447, 448, 449, 543, 548, 549, 550, 555, 556, 576, 577, 594, 599, 600, 601, 609, 614, 615, 616, 747, 748, 749, 751, 754, 758, 759, 760, 761, 762, 763, 764, 765}

1.5 list of integrals solved by CAS but has no known antiderivative

Rubi {}

Mathematica {}

Maple {}

Maxima {}

Fricas {}

Sympy {}

Giac {}

Mupad {}

1.6 list of integrals solved by CAS but failed verification

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

Rubi {}

Mathematica {66}

Maple Verification phase not implemented yet.

Maxima Verification phase not implemented yet.

Fricas Verification phase not implemented yet.

Sympy Verification phase not implemented yet.

Giac Verification phase not implemented yet.

Mupad Verification phase not implemented yet.

1.7 Timing

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

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

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

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

1.8 Verification

A verification phase was applied on the result of integration for Rubi and Mathematica. Future version of this report will implement verification for the other CAS systems. For the integrals whose result was not run through a verification phase, it is assumed that the antiderivative produced was correct.

Verification phase has 3 minutes time out. An integral whose result was not verified could still be correct. Further investigation is needed on those integrals which failed verifications. Such integrals are marked in the summary table below and also in each integral separate section so they are easy to identify and locate.

1.9 Important notes about some of the results

1.9.1 Important note about Maxima results

Since these integrals are run in a batch mode, using an automated script, and by using sagemath (SageMath uses Maxima), then any integral where Maxima needs an interactive response from the user to answer a question during evaluation of the integral in order to complete the integration, will fail and is counted as failed.

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

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

Such integrals can be indentified by looking at the output of the integration in each section for Maxima. The exception message will indicate of the error is due to the interactive question being asked or not.

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

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

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

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

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

1.9.2 Important note about FriCAS and Giac/XCAS results

There are Few integrals which failed due to SageMath not able to translate the result back to SageMath syntax and not because these CAS system were not able to do the integrations.

These will fail With error `Exception raised: NotImplementedError`

The number of such cases seems to be very small. About 1 or 2 percent of all integrals.

Hopefully the next version of SageMath will have complete translation of FriCAS and XCAS syntax and I will re-run all the tests again when this happens.

1.9.3 Important note about finding leaf size of antiderivative

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

The other CAS systems (SageMath and Sympy) do not have special buildin function for this purpose at this time. Therefore the leaf size for Fricas and Sympy and Giac antiderivatives is determined using the following function, thanks to user `slelievre` at `https://`

ask.sagemath.org/question/57123/could-we-have-a-leaf_count-function-in-base-sagemath/

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

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

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

  except Exception as ee:
         leafCount =1
```

1.9.4 Important note about Mupad results

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

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

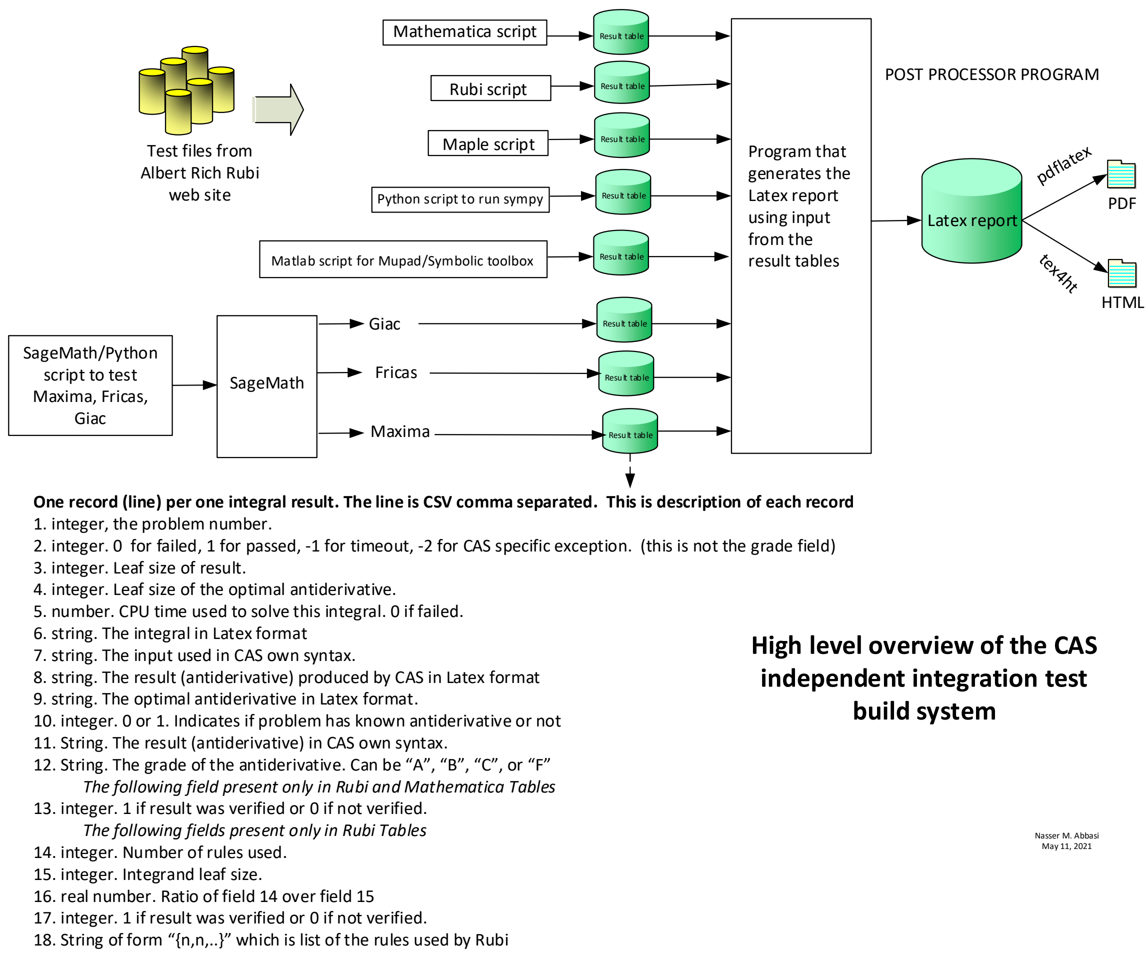
The following is an example of using Matlab's symbolic toolbox (Mupad) to solve an integral

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

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

1.10 Design of the test system

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



Chapter 2

detailed summary tables of results

2.1 List of integrals sorted by grade for each CAS

2.1.1 Rubi

A grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 693, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774 }

B grade: { }

C grade: { 70, 71, 96, 97, 126, 127, 139, 140, 165, 166, 255, 256, 281, 282, 312, 313, 325, 326, 351, 352, 368, 369 }

F grade: { 595, 596, 597, 610, 611, 612, 692, 694 }

2.1.2 Mathematica

A grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 401, 402, 403, 404, 405, 406, 407, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 525, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 543, 547, 548, 549, 550, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 569, 570, 571, 574, 575, 576, 577, 579, 580, 581, 582, 583, 584, 585, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 632, 633, 634, 635, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774 }

B grade: { 572, 573, 578, 631, 636 }

C grade: { 70, 71, 96, 97, 126, 127, 139, 140, 165, 166, 183, 184, 255, 256, 281, 282, 312, 313, 325, 326, 351, 352, 368, 369, 370, 371, 372, 462, 463, 464, 465, 466, 663, 728 }

F grade: { 16, 17, 399, 400, 408, 423, 424, 425, 524, 526, 541, 542, 544, 545, 546, 551, 552, 553, 567, 568, 586, 587, 602 }

2.1.3 Maple

A grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13, 14, 15, 16, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 34, 36, 38, 39, 40, 41, 42, 44, 47, 48, 51, 52, 54, 55, 58, 59, 60, 61, 62, 63, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 96, 97, 98, 99, 100, 101, 114, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 161, 162, 163, 164, 165, 166, 179, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 205, 206, 207, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 237, 238, 239, 240, 241, 243, 244, 245, 246, 251, 252, 253, 258, 259, 260, 261, 262, 263, 264, 273, 274, 275, 276, 277, 278, 279, 285, 286, 305, 306, 307, 308, 309, 310, 311, 319, 320, 321, 331, 332, 333, 334, 335, 336, 337, 338, 339, 347, 364, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 380, 381, 386, 387, 388, 389, 390, 395, 396, 397, 398, 399, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 420, 421, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 469, 473, 474, 475, 476, 477, 478, 479, 480, 487, 488, 493, 494, 495, 496, 497, 498, 499, 500, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 520, 523, 525, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 543, 547, 548, 549, 550, 555, 556, 563, 564, 565, 569, 570, 571, 576, 577, 594, 599, 600, 601, 609, 614, 615, 616, 617, 618, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 637, 638, 639, 640, 641, 642, 643, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 666, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766 }

B grade: { 12, 33, 35, 37, 43, 69, 80, 81, 95, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 115, 116, 117, 128, 129, 130, 154, 155, 156, 157, 158, 159, 160, 167, 168, 169, 170, 171, 172, 173, 242, 255, 256, 257, 265, 266, 267, 268, 269, 270, 271, 272, 281, 282, 283, 284, 302, 303, 304, 312, 313, 315, 316, 317, 318, 322, 323, 324, 325, 326, 327, 328, 329, 330, 348, 349, 350, 351, 352, 378, 379, 382, 383, 384, 385, 400, 401, 402, 422, 423, 424, 425, 444, 465, 466, 467, 468, 470, 471, 472, 481, 482, 483, 484, 485, 486, 521, 522, 524, 527, 528, 540, 541, 554, 574, 575, 578, 636, 644, 665, 692, 704 }

C grade: { 566, 567, 568, 767 }

F grade: { 17, 45, 46, 49, 50, 53, 56, 57, 64, 65, 66, 67, 68, 174, 175, 176, 177, 178, 180, 181, 182, 202, 203, 204, 208, 209, 210, 211, 212, 232, 233, 234, 235, 236, 247, 248, 249, 250, 254, 280, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 314, 340, 341, 342, 343, 344, 345, 346, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 365, 366, 367, 391, 392, 393, 394, 416, 417, 418, 419, 489, 490, 491, 492, 501, 502, 503, 504, 517, 518, 519, 526, 539, 542, 544, 545, 546, 551, 552, 553, 557, 558, 559, 560, 561, 562, 572, 573, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 595, 596, 597, 598, 602, 603, 604, 605, 606, 607, 608, 610, 611, 612, 613, 619, 667, 726, 768, 769, 770, 771, 772, 773, 774 }

2.1.4 Maxima

A grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 18, 19, 22, 23, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 40, 41, 42, 43, 47, 51, 54, 58, 59, 60, 61, 62, 65, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 108, 109, 110, 111, 112, 113, 114, 115, 118, 119, 120, 121, 122, 128, 131, 132, 133, 134, 135, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 157, 158, 159, 160, 161, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 198, 199, 200, 201, 205, 206, 207, 213, 214, 215, 229, 230, 231, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 251, 252, 253, 260, 273, 286, 299, 300, 308, 321, 322, 347, 368, 369, 370, 371, 372, 373, 387, 388, 389, 390, 395, 396, 413, 414, 415, 420, 421, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 447, 448, 449, 452, 458, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 485, 486, 488, 490, 492, 493, 494, 495, 496, 497, 498, 499, 500, 502, 504, 505, 506, 507, 508, 510, 511, 515, 516, 520, 523, 525, 529, 530, 531, 532, 533, 534, 535, 536, 543, 547, 548, 549, 550, 555, 556, 563, 564, 566, 567, 568, 571, 576, 577, 594, 599, 600, 601, 609, 614, 615, 616, 617, 618, 623, 636, 637, 639, 640, 641, 642, 643, 645, 646, 647, 648, 649, 650, 651, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 719, 721, 722, 723, 724, 725, 727, 728, 730, 732, 733, 734, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 774 }

B grade: { 20, 21, 24, 25, 39, 80, 81, 106, 107, 116, 117, 129, 130, 155, 156, 197, 267, 268, 269, 270, 271, 272, 281, 282, 283, 284, 285, 323, 324, 325, 326, 348, 349, 350, 351, 352, 382, 383, 384, 385, 386, 444, 445, 446, 451, 457, 483, 484, 487, 554, 638, 644, 652, 665, 704, 718, 720, 731 }

C grade: { 123, 124, 125, 126, 127, 136, 137, 138, 139, 140, 162, 163, 164, 165, 166, 255, 256, 257, 258, 259, 450, 456, 620, 621, 622, 735 }

F grade: { 17, 44, 45, 46, 48, 49, 50, 52, 53, 55, 56, 57, 63, 64, 66, 67, 68, 202, 203, 204, 208, 209, 210, 211, 212, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 232, 233, 234, 235, 236, 247, 248, 249, 250, 254, 261, 262, 263, 264, 265, 266, 274, 275, 276, 277, 278, 279, 280, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 301, 302, 303, 304, 305, 306, 307, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 374, 375, 376, 377, 378, 379, 380, 381, 391, 392, 393, 394, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 416, 417, 418, 419, 422, 423, 424, 425, 453, 454, 455, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 489, 491, 501, 503, 509, 512, 513, 514, 517, 518, 519, 521, 522, 524, 526, 527, 528, 537, 538, 539, 540, 541, 542, 544, 545, 546, 551, 552, 553, 557, 558, 559, 560, 561, 562, 565, 569, 570, 572, 573, 574, 575, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 595, 596, 597, 598, 602, 603, 604, 605, 606, 607, 608, 610, 611, 612, 613, 619, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 726, 729, 771, 772, 773 }

2.1.5 FriCAS

A grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 21, 22, 23, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 40, 43, 44, 47, 51, 54, 55, 58, 59, 60, 62, 65, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 108, 109, 110, 111, 112, 113, 114, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 179, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 251, 252, 253, 254, 257, 258, 259, 260, 261, 267, 268, 270, 271, 272, 273, 274, 275, 280, 284, 285, 286, 294, 295, 299, 300, 304, 305, 306, 307, 308, 309, 310, 311, 317, 318, 319, 320, 322, 329, 330, 331, 332, 333, 334, 338, 339, 356, 357, 364, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 403, 404, 405, 406, 407, 409, 410, 411, 412, 413, 414, 415, 416, 417, 420, 421, 422, 423, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 520, 521, 522, 523, 524, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 540, 541, 547, 548, 549, 554, 555, 556, 557, 558, 559, 560, 563, 564, 565, 566, 567, 568, 569, 570, 571, 574, 575, 576, 577, 578, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 637, 640, 641, 642, 643, 645, 646, 647, 649, 650, 651, 653, 654, 655, 656, 658, 659, 660, 661, 662, 663, 664, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 682, 683, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 705, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 721, 722, 723, 724, 725, 726, 727, 729, 730, 731, 733, 734, 735, 737, 738, 739, 740, 741, 742, 743, 757, 758, 760, 761, 762, 763, 764, 765, 766, 773 }

B grade: { 20, 24, 39, 48, 52, 63, 80, 81, 106, 107, 116, 117, 129, 130, 155, 156, 216, 217, 236, 255, 256, 262, 263, 264, 265, 266, 269, 276, 277, 278, 279, 281, 282, 283, 287, 288, 289, 290, 291, 292, 293, 296, 297, 298, 302, 303, 312, 313, 315, 316, 321, 323, 324, 325, 326, 327, 328, 335, 336, 337, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 358, 378, 379, 399, 400, 401, 402, 408, 418, 419, 424, 425, 636, 638, 639, 644, 648, 652, 657, 665, 681, 684, 704, 706, 720, 728 }

C grade: { 41, 42, 45, 46, 49, 50, 53, 56, 57, 61, 64, 515, 516, 517, 518, 519, 525, 526, 539, 542, 572, 573 }

F grade: { 66, 67, 68, 115, 128, 154, 174, 175, 176, 177, 178, 180, 181, 182, 193, 194, 247, 248, 249, 250, 301, 314, 340, 359, 360, 361, 362, 363, 365, 366, 367, 543, 544, 545, 546, 550, 551, 552, 553, 561, 562, 579, 580, 581, 582, 583, 584, 585, 627, 628, 629, 630, 631, 632, 633, 634, 635, 732, 736, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 759, 767, 768, 769, 770, 771, 772, 774 }

2.1.6 Sympy

A grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14, 18, 19, 21, 22, 23, 25, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 43, 47, 51, 54, 58, 59, 62, 70, 71, 72, 73, 74, 75, 96, 97, 98, 99, 100, 101, 114, 122, 123, 124, 125, 126, 127, 135, 136, 137, 138, 139, 140, 161, 162, 163, 164, 165, 166, 185, 194, 199, 200, 201, 205, 206, 207, 213, 215, 229, 230, 231, 237, 238, 239, 240, 241, 243, 244, 245, 246, 251, 252, 253, 255, 256, 257, 258, 259, 260, 281, 282, 283, 284, 285, 286, 299, 308, 309, 310, 311, 321, 322, 347, 388, 389, 390, 395, 396, 413, 414, 420, 430, 431, 435, 436, 437, 442, 443, 447, 448, 449, 450, 452, 456, 458, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 497, 498, 499, 500, 505, 506, 507, 508, 509, 520, 521, 522, 527, 528, 529, 530, 532, 533, 535, 536, 537, 540, 548, 549, 550, 555, 563, 564, 565, 569, 571, 575, 576, 589, 590, 597, 598, 599, 614, 617, 618, 620, 621, 622, 623, 624, 625, 629, 630, 632, 633, 636, 639, 640, 641, 642, 644, 645, 646, 647, 648, 650, 651, 654, 655, 656, 657, 658, 663, 664, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 682, 683, 685, 686, 687, 688, 690, 691, 692, 693, 694, 695, 696, 697, 702, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 719, 721, 722, 723, 724, 725, 727, 729, 730, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 747, 748, 749, 751, 752, 754, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766 }

B grade: { 20, 24, 38, 39, 312, 313, 323, 324, 325, 326, 348, 349, 350, 351, 352, 547, 554, 631, 637, 638, 649, 652, 653, 662, 665, 666, 703, 704, 718, 720, 728 }

C grade: { 769 }

F grade: { 13, 15, 16, 17, 26, 40, 41, 42, 44, 45, 46, 48, 49, 50, 52, 53, 55, 56, 57, 60, 61, 63, 64, 65, 66, 67, 68, 69, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 115, 116, 117, 118, 119, 120, 121, 128, 129, 130, 131, 132, 133, 134, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 186, 187, 188, 189, 190, 191, 192, 193, 195, 196, 197, 198, 202, 203, 204, 208, 209, 210, 211, 212, 214, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 232, 233, 234, 235, 236, 242, 247, 248, 249, 250, 254, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 300, 301, 302, 303, 304, 305, 306, 307, 314, 315, 316, 317, 318, 319, 320, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 391, 392, 393, 394, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 415, 416, 417, 418, 419, 421, 422, 423, 424, 425, 426, 427, 428, 429, 432, 433, 434, 438, 439, 440, 441, 444, 445, 446, 451, 453, 454, 455, 457, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 493, 494, 495, 496, 501, 502, 503, 504, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 523, 524, 525, 526, 531, 534, 538, 539, 541, 542, 543, 544, 545, 546, 551, 552, 553, 556, 557, 558, 559, 560, 561, 562, 566, 567, 568, 570, 572, 573, 574, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 591, 592, 593, 594, 595, 596, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 615, 616, 619, 626, 627, 628, 634, 635, 643, 659, 660, 661, 681, 684, 689, 698, 699, 700, 701, 705, 726, 731, 744, 745, 746, 750, 753, 755, 756, 767, 768, 770, 771, 772, 773, 774 }

2.1.7 Giac

A grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 43, 47, 51, 54, 58, 62, 65, 70, 71, 72, 73, 75, 82, 83, 84, 85, 86, 87, 88, 97, 98, 99, 101, 114, 122, 135, 161, 185, 191, 194, 195, 196, 197, 198, 199, 200, 201, 205, 206, 207, 213, 214, 215, 229, 230, 231, 237, 238, 239, 240, 241, 243, 244, 245, 246, 251, 252, 253, 255, 256, 257, 258, 260, 267, 268, 269, 270, 271, 272, 273, 286, 308, 373, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 395, 396, 403, 404, 405, 413, 414, 415, 420, 421, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 451, 452, 457, 458, 474, 476, 478, 480, 482, 484, 486, 488, 490, 492, 494, 496, 498, 500, 502, 504, 505, 506, 507, 508, 509, 521, 522, 527, 528, 529, 530, 532, 535, 536, 537, 540, 543, 547, 548, 549, 550, 575, 576, 577, 586, 590, 594, 598, 599, 600, 601, 605, 609, 613, 614, 615, 616, 617, 618, 621, 622, 623, 627, 628, 629, 630, 631, 636, 637, 640, 641, 642, 643, 645, 646, 647, 648, 649, 650, 651, 653, 654, 655, 656, 658, 659, 660, 661, 662, 663, 664, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 705, 707, 708, 709, 710, 711, 712, 713, 714, 715, 717, 718, 719, 721, 722, 723, 727, 728, 730, 731, 732, 733, 735, 737, 738, 739, 740, 741, 742, 743, 744, 747, 748, 749, 751, 752, 754, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766 }

B grade: { 39, 74, 100, 259, 283, 284, 285, 299, 300, 321, 323, 347, 401, 402, 406, 407, 408, 450, 456, 554, 563, 564, 565, 569, 570, 571, 620, 638, 639, 644, 652, 657, 665, 704, 706, 720, 729, 736 }

C grade: { }

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2.1.8 Mupad

A grade: { 199, 200, 201, 205, 206, 207, 213, 214, 229, 230, 231, 237, 238, 239, 240, 241, 243, 244, 245, 246, 251, 252, 253, 388, 389, 390, 395, 396, 413, 414, 415, 420, 421, 430, 431, 436, 437, 442, 443, 447, 448, 449, 543, 548, 549, 550, 555, 556, 576, 577, 594, 599, 600, 601, 609, 614, 615, 616, 747, 748, 749, 751, 754, 758, 759, 760, 761, 762, 763, 764, 765 }

B grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 43, 47, 51, 54, 58, 59, 62, 65, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 180, 181, 182, 185, 194, 195, 196, 197, 198, 215, 218, 219, 220, 228, 236, 242, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 365, 366, 367, 373, 380, 381, 382, 383, 384, 385, 386, 387, 403, 404, 405, 412, 419, 426, 427, 428, 429, 432, 433, 434, 435, 438, 439, 440, 441, 444, 445, 446, 450, 451, 452, 454, 456, 457, 458, 460, 473, 474, 475, 476, 478, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 505, 506, 507, 508, 509, 520, 521, 522, 527, 528, 529, 530, 532, 533, 535, 536, 537, 540, 547, 554, 563, 564, 565, 566, 567, 568, 569, 570, 571, 575, 581, 591, 606, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 726, 727, 728, 729, 730, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 750, 752, 753, 755, 756, 757, 769, 770, 771, 772, 774 }

C grade: { }

F grade: { 17, 40, 41, 42, 44, 45, 46, 48, 49, 50, 52, 53, 55, 56, 57, 60, 61, 63, 64, 66, 67, 68, 110, 111, 177, 178, 179, 183, 184, 186, 187, 188, 189, 190, 191, 192, 193, 202, 203, 204, 208, 209, 210, 211, 212, 216, 217, 221, 222, 223, 224, 225, 226, 227, 232, 233, 234, 235, 247, 248, 249, 250, 294, 295, 362, 363, 364, 368, 369, 370, 371, 372, 374, 375, 376, 377, 378, 379, 391, 392, 393, 394, 397, 398, 399, 400, 401, 402, 406, 407, 408, 409, 410, 411, 416, 417, 418, 422, 423, 424, 425, 453, 455, 459, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 477, 479, 501, 502, 503, 504, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 523, 524, 525, 526, 531, 534, 538, 539, 541, 542, 544, 545, 546, 551, 552, 553, 557, 558, 559, 560, 561, 562, 572, 573, 574, 578, 579, 580, 582, 583, 584, 585, 586, 587, 588, 589, 590, 592, 593, 595, 596, 597, 598, 602, 603, 604, 605, 607, 608, 610, 611, 612, 613, 636, 667, 705, 725, 731, 766, 767, 768, 773 }

2.2 Detailed conclusion table per each integral for all CAS systems

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

In this table,the column **normalized size** is defined as $\frac{\text{antiderivative leaf size}}{\text{optimal antiderivative leaf size}}$

Problem 1	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	10	9	9	8	9	9
normalized size	1	1.00	1.00	0.83	0.75	0.75	0.67	0.75	0.75
time (sec)	N/A	0.017	0.007	0.004	0.427	0.392	0.087	0.239	0.053

Problem 2	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	12	11	11	8	12	11
normalized size	1	1.00	1.00	1.00	0.92	0.92	0.67	1.00	0.92
time (sec)	N/A	0.020	0.006	0.003	0.424	0.389	0.111	0.354	0.057

Problem 3	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	24	23	22	22	19	23	22
normalized size	1	1.00	1.00	0.96	0.92	0.92	0.79	0.96	0.92
time (sec)	N/A	0.069	0.013	0.010	0.435	0.413	0.161	0.258	0.122

Problem 4	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	19	18	18	14	19	18
normalized size	1	1.00	1.00	1.00	0.95	0.95	0.74	1.00	0.95
time (sec)	N/A	0.036	0.007	0.003	0.432	0.403	0.128	0.344	0.049

Problem 5	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	19	20	19	22	56	19	19
normalized size	1	1.00	0.95	1.00	0.95	1.10	2.80	0.95	0.95
time (sec)	N/A	0.020	0.021	0.003	0.432	0.421	0.917	0.320	3.500

Problem 6	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	31	31	30	36	114	38	44
normalized size	1	1.00	0.97	0.97	0.94	1.12	3.56	1.19	1.38
time (sec)	N/A	0.070	0.036	0.011	0.437	0.429	14.330	0.389	3.547

Problem 7	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	26	27	26	33	107	26	26
normalized size	1	1.00	0.96	1.00	0.96	1.22	3.96	0.96	0.96
time (sec)	N/A	0.035	0.025	0.003	0.430	0.425	18.737	0.343	3.477

Problem 8	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	17	16	16	12	17	16
normalized size	1	1.00	1.00	1.06	1.00	1.00	0.75	1.06	1.00
time (sec)	N/A	0.021	0.006	0.003	0.432	0.420	0.124	0.291	3.442

Problem 9	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	28	33	28	28	24	30	28
normalized size	1	1.00	1.00	1.18	1.00	1.00	0.86	1.07	1.00
time (sec)	N/A	0.071	0.009	0.026	0.434	0.411	0.386	0.315	3.578

Problem 10	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	23	23	23	24	23	23	17	24	23
normalized size	1	1.00	1.00	1.04	1.00	1.00	0.74	1.04	1.00
time (sec)	N/A	0.036	0.006	0.003	0.434	0.417	0.139	0.412	0.002

Problem 11	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	24	25	24	28	82	24	24
normalized size	1	1.00	1.00	1.04	1.00	1.17	3.42	1.00	1.00
time (sec)	N/A	0.023	0.024	0.004	0.430	0.433	1.263	0.432	3.480

Problem 12	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	36	36	35	81	36	50	141	36	55
normalized size	1	1.00	0.97	2.25	1.00	1.39	3.92	1.00	1.53
time (sec)	N/A	0.073	0.044	0.043	0.439	0.428	145.675	0.440	3.532

Problem 13	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	30	32	31	39	0	31	52
normalized size	1	1.00	0.97	1.03	1.00	1.26	0.00	1.00	1.68
time (sec)	N/A	0.035	0.031	0.003	0.436	0.432	0.000	0.439	3.428

Problem 14	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	25	25	24	25	24	29	80	24	24
normalized size	1	1.00	0.96	1.00	0.96	1.16	3.20	0.96	0.96
time (sec)	N/A	0.037	0.070	0.002	0.438	0.432	2.381	0.457	3.510

Problem 15	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	37	37	36	52	24	29	0	30	24
normalized size	1	1.00	0.97	1.41	0.65	0.78	0.00	0.81	0.65
time (sec)	N/A	0.059	0.044	0.026	0.443	0.432	0.000	0.413	3.436

Problem 16	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	A	A	A	F(-1)	A	B
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	41	41	0	42	41	53	0	43	74
normalized size	1	1.00	0.00	1.02	1.00	1.29	0.00	1.05	1.80
time (sec)	N/A	0.065	0.311	0.014	0.441	0.430	0.000	0.501	3.514

Problem 17	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	A	F(-1)	A	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	0	0	0	88	0	156	-1
normalized size	1	1.00	0.00	0.00	0.00	1.10	0.00	1.95	-0.01
time (sec)	N/A	0.135	0.320	0.741	0.000	0.447	0.000	1.932	0.000

Problem 18	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	22	21	20	19	20	21	20
normalized size	1	1.00	1.00	0.95	0.91	0.86	0.91	0.95	0.91
time (sec)	N/A	0.032	0.017	0.011	0.437	0.430	0.129	0.394	3.571

Problem 19	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	24	26	28	31	24	26	27
normalized size	1	1.00	0.89	0.96	1.04	1.15	0.89	0.96	1.00
time (sec)	N/A	0.034	0.025	0.016	0.438	0.420	0.134	0.368	3.612

Problem 20	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	B	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	21	29	61	35	37	20	29
normalized size	1	1.00	1.00	1.38	2.90	1.67	1.76	0.95	1.38
time (sec)	N/A	0.023	0.010	0.016	0.478	0.395	0.133	0.396	3.560

Problem 21	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	24	29	85	47	51	20	53
normalized size	1	1.00	0.71	0.85	2.50	1.38	1.50	0.59	1.56
time (sec)	N/A	0.036	0.023	0.016	0.460	0.419	0.164	0.380	3.597

Problem 22	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	30	26	25	24	29	26	24
normalized size	1	1.00	0.97	0.84	0.81	0.77	0.94	0.84	0.77
time (sec)	N/A	0.034	0.016	0.013	0.439	0.405	0.141	0.244	0.068

Problem 23	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	37	37	31	32	34	38	32	32	34
normalized size	1	1.00	0.84	0.86	0.92	1.03	0.86	0.86	0.92
time (sec)	N/A	0.038	0.025	0.018	0.436	0.393	0.139	0.365	3.549

Problem 24	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	B	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	23	23	23	33	67	39	41	24	31
normalized size	1	1.00	1.00	1.43	2.91	1.70	1.78	1.04	1.35
time (sec)	N/A	0.027	0.009	0.020	0.463	0.407	0.135	0.300	3.565

Problem 25	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	28	33	91	51	54	24	55
normalized size	1	1.00	0.74	0.87	2.39	1.34	1.42	0.63	1.45
time (sec)	N/A	0.037	0.019	0.020	0.677	0.434	0.166	0.306	3.601

Problem 26	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	42	42	31	27	32	25	0	32	26
normalized size	1	1.00	0.74	0.64	0.76	0.60	0.00	0.76	0.62
time (sec)	N/A	0.048	0.020	0.025	0.628	0.415	0.000	0.275	3.495

Problem 27	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	24	15	21	15	15	15
normalized size	1	1.00	1.00	1.50	0.94	1.31	0.94	0.94	0.94
time (sec)	N/A	0.019	0.009	0.011	0.691	0.391	0.109	0.411	0.075

Problem 28	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	31	39	30	34	39	30	30
normalized size	1	1.00	0.97	1.22	0.94	1.06	1.22	0.94	0.94
time (sec)	N/A	0.034	0.019	0.009	0.681	0.409	0.150	0.318	0.093

Problem 29	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	52	52	48	57	47	48	73	47	44
normalized size	1	1.00	0.92	1.10	0.90	0.92	1.40	0.90	0.85
time (sec)	N/A	0.042	0.027	0.010	0.440	0.411	0.185	0.327	3.520

Problem 30	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	34	47	32	39	34	38	38
normalized size	1	1.00	0.85	1.18	0.80	0.98	0.85	0.95	0.95
time (sec)	N/A	0.044	0.039	0.013	0.435	0.432	0.163	0.319	3.566

Problem 31	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	61	61	49	67	57	84	61	59	86
normalized size	1	1.00	0.80	1.10	0.93	1.38	1.00	0.97	1.41
time (sec)	N/A	0.057	0.114	0.014	0.440	0.433	0.186	0.247	3.666

Problem 32	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	83	83	69	86	85	140	95	76	104
normalized size	1	1.00	0.83	1.04	1.02	1.69	1.14	0.92	1.25
time (sec)	N/A	0.068	0.139	0.012	0.633	0.430	0.221	0.398	0.192

Problem 33	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	50	50	50	91	45	179	51	48	64
normalized size	1	1.00	1.00	1.82	0.90	3.58	1.02	0.96	1.28
time (sec)	N/A	0.078	0.026	0.076	1.005	0.429	0.873	0.304	3.848

Problem 34	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	47	32	32	42	37	37
normalized size	1	1.00	1.00	1.38	0.94	0.94	1.24	1.09	1.09
time (sec)	N/A	0.081	0.019	0.029	0.435	0.418	0.773	0.326	3.634

Problem 35	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	88	88	67	171	76	166	110	77	66
normalized size	1	1.00	0.76	1.94	0.86	1.89	1.25	0.88	0.75
time (sec)	N/A	0.068	0.070	0.097	0.999	0.438	1.352	0.360	3.548

Problem 36	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	61	61	48	76	65	53	92	66	47
normalized size	1	1.00	0.79	1.25	1.07	0.87	1.51	1.08	0.77
time (sec)	N/A	0.060	0.046	0.038	0.450	0.425	1.191	0.285	3.543

Problem 37	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	127	127	86	212	97	211	185	122	102
normalized size	1	1.00	0.68	1.67	0.76	1.66	1.46	0.96	0.80
time (sec)	N/A	0.080	0.068	0.096	0.971	0.446	1.673	0.315	3.556

Problem 38	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	4	4	4	4	3	3	15	3	3
normalized size	1	1.00	1.00	1.00	0.75	0.75	3.75	0.75	0.75
time (sec)	N/A	0.017	0.003	0.012	0.972	0.475	0.111	0.318	3.475

Problem 39	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	4	4	4	4	15	15	15	16	15
normalized size	1	1.00	1.00	1.00	3.75	3.75	3.75	4.00	3.75
time (sec)	N/A	0.019	0.004	0.011	0.441	0.436	0.107	0.331	0.133

Problem 40	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	45	34	31	31	0	0	-1
normalized size	1	1.00	1.67	1.26	1.15	1.15	0.00	0.00	-0.04
time (sec)	N/A	0.058	0.035	0.017	0.451	0.439	0.000	0.000	0.000

Problem 41	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	C	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	60	51	48	48	0	0	-1
normalized size	1	1.00	1.50	1.28	1.20	1.20	0.00	0.00	-0.02
time (sec)	N/A	0.100	0.037	0.015	0.450	0.437	0.000	0.000	0.000

Problem 42	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	C	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	69	69	89	74	71	71	0	0	-1
normalized size	1	1.00	1.29	1.07	1.03	1.03	0.00	0.00	-0.01
time (sec)	N/A	0.121	0.047	0.018	0.475	0.447	0.000	0.000	0.000

Problem 43	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	30	53	21	86	24	21	21
normalized size	1	1.00	1.00	1.77	0.70	2.87	0.80	0.70	0.70
time (sec)	N/A	0.029	0.009	0.045	1.011	0.451	0.182	0.350	3.500

Problem 44	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	110	110	108	134	0	112	0	0	-1
normalized size	1	1.00	0.98	1.22	0.00	1.02	0.00	0.00	-0.01
time (sec)	N/A	0.106	0.069	0.059	0.000	0.453	0.000	0.000	0.000

Problem 45	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	C	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	184	184	168	0	0	176	0	0	-1
normalized size	1	1.00	0.91	0.00	0.00	0.96	0.00	0.00	-0.01
time (sec)	N/A	0.179	0.054	0.053	0.000	0.423	0.000	0.000	0.000

Problem 46	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	C	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	268	268	224	0	0	239	0	0	-1
normalized size	1	1.00	0.84	0.00	0.00	0.89	0.00	0.00	-0.00
time (sec)	N/A	0.230	0.054	0.057	0.000	0.459	0.000	0.000	0.000

Problem 47	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	53	82	49	164	53	49	49
normalized size	1	1.00	0.90	1.39	0.83	2.78	0.90	0.83	0.83
time (sec)	N/A	0.039	0.059	0.054	0.970	0.436	0.233	0.300	3.498

Problem 48	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	172	172	271	195	0	311	0	0	-1
normalized size	1	1.00	1.58	1.13	0.00	1.81	0.00	0.00	-0.01
time (sec)	N/A	0.158	0.151	0.073	0.000	0.437	0.000	0.000	0.000

Problem 49	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	C	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	333	333	477	0	0	388	0	0	-1
normalized size	1	1.00	1.43	0.00	0.00	1.17	0.00	0.00	-0.00
time (sec)	N/A	0.365	0.125	0.188	0.000	0.429	0.000	0.000	0.000

Problem 50	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	C	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	501	501	434	0	0	549	0	0	-1
normalized size	1	1.00	0.87	0.00	0.00	1.10	0.00	0.00	-0.00
time (sec)	N/A	0.514	0.268	0.182	0.000	0.442	0.000	0.000	0.000

Problem 51	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	84	84	68	94	76	258	85	61	79
normalized size	1	1.00	0.81	1.12	0.90	3.07	1.01	0.73	0.94
time (sec)	N/A	0.051	0.051	0.065	0.983	0.433	0.351	0.404	3.570

Problem 52	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	223	223	184	223	0	494	0	0	-1
normalized size	1	1.00	0.83	1.00	0.00	2.22	0.00	0.00	-0.00
time (sec)	N/A	0.217	0.315	0.088	0.000	0.429	0.000	0.000	0.000

Problem 53	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	C	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	420	420	353	0	0	786	0	0	-1
normalized size	1	1.00	0.84	0.00	0.00	1.87	0.00	0.00	-0.00
time (sec)	N/A	0.582	0.504	0.206	0.000	0.453	0.000	0.000	0.000

Problem 54	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	30	22	24	86	24	21	21
normalized size	1	1.00	1.00	0.73	0.80	2.87	0.80	0.70	0.70
time (sec)	N/A	0.021	0.008	0.007	0.970	0.413	0.185	0.290	3.510

Problem 55	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	110	110	108	134	0	112	0	0	-1
normalized size	1	1.00	0.98	1.22	0.00	1.02	0.00	0.00	-0.01
time (sec)	N/A	0.095	0.064	0.058	0.000	0.421	0.000	0.000	0.000

Problem 56	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	C	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	184	184	168	0	0	176	0	0	-1
normalized size	1	1.00	0.91	0.00	0.00	0.96	0.00	0.00	-0.01
time (sec)	N/A	0.167	0.050	0.051	0.000	0.415	0.000	0.000	0.000

Problem 57	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	C	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	268	268	224	0	0	239	0	0	-1
normalized size	1	1.00	0.84	0.00	0.00	0.89	0.00	0.00	-0.00
time (sec)	N/A	0.220	0.054	0.053	0.000	0.430	0.000	0.000	0.000

Problem 58	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	23	21	23	21	24	20	20
normalized size	1	1.00	1.05	0.95	1.05	0.95	1.09	0.91	0.91
time (sec)	N/A	0.020	0.020	0.003	0.433	0.410	0.122	0.344	3.610

Problem 59	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	63	63	48	56	54	61	53	0	51
normalized size	1	1.00	0.76	0.89	0.86	0.97	0.84	0.00	0.81
time (sec)	N/A	0.078	0.060	0.032	0.502	0.425	0.186	0.000	3.610

Problem 60	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	98	98	90	91	83	159	0	0	-1
normalized size	1	1.00	0.92	0.93	0.85	1.62	0.00	0.00	-0.01
time (sec)	N/A	0.169	0.065	0.048	0.484	0.422	0.000	0.000	0.000

Problem 61	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	C	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	128	128	124	119	107	241	0	0	-1
normalized size	1	1.00	0.97	0.93	0.84	1.88	0.00	0.00	-0.01
time (sec)	N/A	0.225	0.085	0.054	0.498	0.428	0.000	0.000	0.000

Problem 62	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	87	87	70	78	90	261	85	66	113
normalized size	1	1.00	0.80	0.90	1.03	3.00	0.98	0.76	1.30
time (sec)	N/A	0.046	0.054	0.012	0.970	0.442	0.279	0.310	3.643

Problem 63	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	196	196	209	209	0	352	0	0	-1
normalized size	1	1.00	1.07	1.07	0.00	1.80	0.00	0.00	-0.01
time (sec)	N/A	0.503	0.220	0.082	0.000	0.417	0.000	0.000	0.000

Problem 64	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	C	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	316	316	254	0	0	674	0	0	-1
normalized size	1	1.00	0.80	0.00	0.00	2.13	0.00	0.00	-0.00
time (sec)	N/A	1.163	0.519	0.171	0.000	0.438	0.000	0.000	0.000

Problem 65	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	95	95	93	0	90	135	0	131	130
normalized size	1	1.00	0.98	0.00	0.95	1.42	0.00	1.38	1.37
time (sec)	N/A	0.181	0.066	0.052	0.490	0.427	0.000	0.461	0.105

Problem 66	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	106	106	92	0	0	0	0	0	-1
normalized size	1	1.00	0.87	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.093	0.047	0.118	0.000	0.422	0.000	0.000	0.000

Problem 67	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	75	75	75	0	0	0	0	0	-1
normalized size	1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.135	0.166	0.046	0.000	0.404	0.000	0.000	0.000

Problem 68	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	85	85	84	0	0	0	0	0	-1
normalized size	1	1.00	0.99	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.132	0.150	0.066	0.000	0.415	0.000	0.000	0.000

Problem 69	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	46	140	38	40	0	0	49
normalized size	1	1.00	1.00	3.04	0.83	0.87	0.00	0.00	1.07
time (sec)	N/A	0.024	0.012	0.055	0.650	0.420	0.000	0.000	3.628

Problem 70	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	C	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	78	24	24	76	92	75	95	79	76
normalized size	1	0.31	0.31	0.97	1.18	0.96	1.22	1.01	0.97
time (sec)	N/A	0.025	0.003	0.010	0.447	0.417	0.163	0.325	3.559

Problem 71	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	C	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	65	24	24	64	77	63	82	67	63
normalized size	1	0.37	0.37	0.98	1.18	0.97	1.26	1.03	0.97
time (sec)	N/A	0.024	0.003	0.010	0.442	0.404	0.151	0.398	3.539

Problem 72	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	86	86	53	52	62	51	68	55	52
normalized size	1	1.00	0.62	0.60	0.72	0.59	0.79	0.64	0.60
time (sec)	N/A	0.093	0.012	0.009	0.454	0.412	0.142	0.394	3.497

Problem 73	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	62	62	41	40	47	39	54	43	39
normalized size	1	1.00	0.66	0.65	0.76	0.63	0.87	0.69	0.63
time (sec)	N/A	0.063	0.009	0.009	0.441	0.408	0.131	0.405	3.509

Problem 74	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	29	28	32	27	41	690	27
normalized size	1	1.00	0.66	0.64	0.73	0.61	0.93	15.68	0.61
time (sec)	N/A	0.038	0.007	0.008	0.455	0.427	0.120	0.524	3.459

Problem 75	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	20	19	18	18	24	18	18
normalized size	1	1.00	1.00	0.95	0.90	0.90	1.20	0.90	0.90
time (sec)	N/A	0.013	0.002	0.006	0.449	0.419	0.105	0.395	3.298

Problem 76	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	16	13	13	0	0	13
normalized size	1	1.00	1.00	1.07	0.87	0.87	0.00	0.00	0.87
time (sec)	N/A	0.021	0.002	0.027	0.623	0.401	0.000	0.000	3.181

Problem 77	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	32	35	18	35	0	0	32
normalized size	1	1.00	0.91	1.00	0.51	1.00	0.00	0.00	0.91
time (sec)	N/A	0.045	0.010	0.037	0.638	0.407	0.000	0.000	3.427

Problem 78	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	58	58	48	57	22	48	0	0	57
normalized size	1	1.00	0.83	0.98	0.38	0.83	0.00	0.00	0.98
time (sec)	N/A	0.066	0.019	0.045	0.622	0.398	0.000	0.000	3.533

Problem 79	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	81	81	59	79	22	59	0	0	69
normalized size	1	1.00	0.73	0.98	0.27	0.73	0.00	0.00	0.85
time (sec)	N/A	0.091	0.024	0.053	0.647	0.416	0.000	0.000	3.543

Problem 80	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	24	101	22	71	0	0	90
normalized size	1	1.00	1.00	4.21	0.92	2.96	0.00	0.00	3.75
time (sec)	N/A	0.022	0.003	0.066	0.623	0.410	0.000	0.000	3.565

Problem 81	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	24	123	22	83	0	0	102
normalized size	1	1.00	1.00	5.12	0.92	3.46	0.00	0.00	4.25
time (sec)	N/A	0.023	0.003	0.087	0.926	0.410	0.000	0.000	3.511

Problem 82	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	164	127	113	0	116	154
normalized size	1	1.00	1.00	4.82	3.74	3.32	0.00	3.41	4.53
time (sec)	N/A	0.023	0.006	0.147	0.762	0.413	0.000	0.313	3.625

Problem 83	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	142	112	101	0	104	139
normalized size	1	1.00	1.00	4.18	3.29	2.97	0.00	3.06	4.09
time (sec)	N/A	0.023	0.006	0.079	0.752	0.420	0.000	0.331	3.575

Problem 84	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	128	128	95	120	97	89	0	92	116
normalized size	1	1.00	0.74	0.94	0.76	0.70	0.00	0.72	0.91
time (sec)	N/A	0.142	0.043	0.062	0.672	0.418	0.000	0.346	3.546

Problem 85	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	105	105	83	98	82	77	0	80	98
normalized size	1	1.00	0.79	0.93	0.78	0.73	0.00	0.76	0.93
time (sec)	N/A	0.088	0.035	0.051	0.628	0.420	0.000	0.348	3.519

Problem 86	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	71	76	67	65	0	68	75
normalized size	1	1.00	0.87	0.93	0.82	0.79	0.00	0.83	0.91
time (sec)	N/A	0.059	0.027	0.046	0.629	0.419	0.000	0.401	3.543

Problem 87	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	59	54	53	49	0	57	54
normalized size	1	1.00	1.00	0.92	0.90	0.83	0.00	0.97	0.92
time (sec)	N/A	0.034	0.023	0.043	0.782	0.413	0.000	0.273	3.612

Problem 88	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	37	37	37	26	25	32	0	26	26
normalized size	1	1.00	1.00	0.70	0.68	0.86	0.00	0.70	0.70
time (sec)	N/A	0.007	0.005	0.037	0.921	0.417	0.000	0.277	3.551

Problem 89	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	49	44	28	40	0	0	44
normalized size	1	1.00	1.00	0.90	0.57	0.82	0.00	0.00	0.90
time (sec)	N/A	0.031	0.015	0.043	1.269	0.405	0.000	0.000	3.468

Problem 90	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	73	73	62	67	28	57	0	0	70
normalized size	1	1.00	0.85	0.92	0.38	0.78	0.00	0.00	0.96
time (sec)	N/A	0.055	0.044	0.050	1.145	0.411	0.000	0.000	3.562

Problem 91	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	96	96	77	89	28	73	0	0	109
normalized size	1	1.00	0.80	0.93	0.29	0.76	0.00	0.00	1.14
time (sec)	N/A	0.081	0.036	0.056	1.345	0.414	0.000	0.000	3.558

Problem 92	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	119	119	89	111	28	85	0	0	131
normalized size	1	1.00	0.75	0.93	0.24	0.71	0.00	0.00	1.10
time (sec)	N/A	0.108	0.043	0.066	1.295	0.413	0.000	0.000	3.486

Problem 93	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	133	28	97	0	0	153
normalized size	1	1.00	1.00	3.91	0.82	2.85	0.00	0.00	4.50
time (sec)	N/A	0.021	0.006	0.079	1.264	0.414	0.000	0.000	3.513

Problem 94	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	155	28	109	0	0	175
normalized size	1	1.00	1.00	4.56	0.82	3.21	0.00	0.00	5.15
time (sec)	N/A	0.021	0.006	0.113	1.367	0.477	0.000	0.000	3.631

Problem 95	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	46	140	38	40	0	0	56
normalized size	1	1.00	1.00	3.04	0.83	0.87	0.00	0.00	1.22
time (sec)	N/A	0.021	0.012	0.056	1.320	0.449	0.000	0.000	3.392

Problem 96	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	C	A	A	A	A	F(-2)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	78	24	24	76	92	75	95	0	76
normalized size	1	0.31	0.31	0.97	1.18	0.96	1.22	0.00	0.97
time (sec)	N/A	0.022	0.003	0.013	0.929	0.433	0.174	0.000	3.662

Problem 97	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	C	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	65	24	24	64	77	63	82	105	63
normalized size	1	0.37	0.37	0.98	1.18	0.97	1.26	1.62	0.97
time (sec)	N/A	0.023	0.003	0.013	0.926	0.424	0.155	0.285	3.539

Problem 98	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	84	84	53	52	62	51	68	83	51
normalized size	1	1.00	0.63	0.62	0.74	0.61	0.81	0.99	0.61
time (sec)	N/A	0.095	0.011	0.011	0.979	0.426	0.147	0.193	3.457

Problem 99	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	67	67	41	40	47	39	54	61	39
normalized size	1	1.00	0.61	0.60	0.70	0.58	0.81	0.91	0.58
time (sec)	N/A	0.070	0.009	0.009	0.954	0.419	0.136	0.222	3.474

Problem 100	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	29	28	32	27	41	690	27
normalized size	1	1.00	0.66	0.64	0.73	0.61	0.93	15.68	0.61
time (sec)	N/A	0.044	0.007	0.007	0.908	0.450	0.121	0.281	3.246

Problem 101	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	20	19	18	18	24	18	18
normalized size	1	1.00	1.00	0.95	0.90	0.90	1.20	0.90	0.90
time (sec)	N/A	0.022	0.003	0.005	0.925	0.442	0.111	0.213	3.469

Problem 102	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	41	13	13	0	0	13
normalized size	1	1.00	1.00	2.73	0.87	0.87	0.00	0.00	0.87
time (sec)	N/A	0.021	0.002	0.037	1.317	0.414	0.000	0.000	3.239

Problem 103	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	32	97	18	35	0	0	32
normalized size	1	1.00	0.91	2.77	0.51	1.00	0.00	0.00	0.91
time (sec)	N/A	0.042	0.010	0.049	1.363	0.412	0.000	0.000	3.527

Problem 104	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	58	58	48	141	22	48	0	0	57
normalized size	1	1.00	0.83	2.43	0.38	0.83	0.00	0.00	0.98
time (sec)	N/A	0.066	0.019	0.057	1.194	0.407	0.000	0.000	3.319

Problem 105	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	81	81	59	177	22	59	0	0	69
normalized size	1	1.00	0.73	2.19	0.27	0.73	0.00	0.00	0.85
time (sec)	N/A	0.090	0.024	0.063	1.178	0.398	0.000	0.000	3.527

Problem 106	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	24	213	22	71	0	0	90
normalized size	1	1.00	1.00	8.88	0.92	2.96	0.00	0.00	3.75
time (sec)	N/A	0.021	0.002	0.075	1.142	0.401	0.000	0.000	3.576

Problem 107	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	24	249	22	83	0	0	102
normalized size	1	1.00	1.00	10.38	0.92	3.46	0.00	0.00	4.25
time (sec)	N/A	0.021	0.003	0.086	1.294	0.398	0.000	0.000	3.470

Problem 108	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	106	28	49	0	0	71
normalized size	1	1.00	1.00	3.12	0.82	1.44	0.00	0.00	2.09
time (sec)	N/A	0.023	0.006	0.042	1.274	0.427	0.000	0.000	3.561

Problem 109	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	109	28	47	0	0	75
normalized size	1	1.00	1.00	3.21	0.82	1.38	0.00	0.00	2.21
time (sec)	N/A	0.022	0.006	0.043	1.329	0.436	0.000	0.000	3.185

Problem 110	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	75	28	29	0	0	-1
normalized size	1	1.00	1.00	2.21	0.82	0.85	0.00	0.00	-0.03
time (sec)	N/A	0.013	0.005	0.034	1.270	0.417	0.000	0.000	0.000

Problem 111	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	32	78	26	29	0	0	-1
normalized size	1	1.00	1.00	2.44	0.81	0.91	0.00	0.00	-0.03
time (sec)	N/A	0.004	0.004	0.032	1.251	0.423	0.000	0.000	0.000

Problem 112	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	100	28	38	0	0	63
normalized size	1	1.00	1.00	2.94	0.82	1.12	0.00	0.00	1.85
time (sec)	N/A	0.022	0.004	0.040	1.293	0.439	0.000	0.000	3.475

Problem 113	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	102	28	41	0	0	70
normalized size	1	1.00	1.00	3.00	0.82	1.21	0.00	0.00	2.06
time (sec)	N/A	0.021	0.004	0.045	1.654	0.448	0.000	0.000	3.584

Problem 114	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	11	11	11	9	8	8	7	8	8
normalized size	1	1.00	1.00	0.82	0.73	0.73	0.64	0.73	0.73
time (sec)	N/A	0.014	0.002	0.004	1.093	0.397	0.090	0.210	0.043

Problem 115	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	35	136	35	0	0	0	52
normalized size	1	1.00	1.00	3.89	1.00	0.00	0.00	0.00	1.49
time (sec)	N/A	0.018	0.008	0.059	1.612	0.405	0.000	0.000	3.505

Problem 116	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	22	121	22	80	0	0	99
normalized size	1	1.00	1.00	5.50	1.00	3.64	0.00	0.00	4.50
time (sec)	N/A	0.019	0.002	0.112	1.517	0.422	0.000	0.000	3.692

Problem 117	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	21	99	21	68	0	0	87
normalized size	1	1.00	1.00	4.71	1.00	3.24	0.00	0.00	4.14
time (sec)	N/A	0.020	0.002	0.092	1.627	0.412	0.000	0.000	3.626

Problem 118	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	79	79	53	77	22	56	0	0	66
normalized size	1	1.00	0.67	0.97	0.28	0.71	0.00	0.00	0.84
time (sec)	N/A	0.059	0.025	0.088	1.969	0.413	0.000	0.000	3.600

Problem 119	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	56	40	55	21	43	0	0	54
normalized size	1	1.00	0.71	0.98	0.38	0.77	0.00	0.00	0.96
time (sec)	N/A	0.035	0.019	0.086	1.621	0.415	0.000	0.000	3.640

Problem 120	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	28	31	18	30	0	0	27
normalized size	1	1.00	1.00	1.11	0.64	1.07	0.00	0.00	0.96
time (sec)	N/A	0.022	0.007	0.084	1.585	0.420	0.000	0.000	3.600

Problem 121	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	15	13	13	0	0	13
normalized size	1	1.00	1.00	1.15	1.00	1.00	0.00	0.00	1.00
time (sec)	N/A	0.018	0.002	0.083	1.590	0.405	0.000	0.000	3.489

Problem 122	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	19	18	20	20	20	18
normalized size	1	1.00	1.00	1.06	1.00	1.11	1.11	1.11	1.00
time (sec)	N/A	0.018	0.003	0.003	1.061	0.414	0.116	0.182	3.516

Problem 123	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	C	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	39	27	49	21	31	22	0	27
normalized size	1	1.00	0.69	1.26	0.54	0.79	0.56	0.00	0.69
time (sec)	N/A	0.036	0.006	0.023	1.293	0.398	0.125	0.000	3.547

Problem 124	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	C	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	61	61	41	73	22	43	39	0	45
normalized size	1	1.00	0.67	1.20	0.36	0.70	0.64	0.00	0.74
time (sec)	N/A	0.060	0.008	0.025	1.259	0.407	0.136	0.000	3.554

Problem 125	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	C	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	53	96	21	55	53	0	57
normalized size	1	1.00	0.65	1.17	0.26	0.67	0.65	0.00	0.70
time (sec)	N/A	0.082	0.010	0.026	1.295	0.421	0.145	0.000	3.545

Problem 126	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	C	A	C	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	65	22	22	119	22	67	66	0	69
normalized size	1	0.34	0.34	1.83	0.34	1.03	1.02	0.00	1.06
time (sec)	N/A	0.018	0.003	0.029	1.240	0.422	0.156	0.000	3.598

Problem 127	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	C	A	C	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	77	21	21	142	21	79	80	0	81
normalized size	1	0.27	0.27	1.84	0.27	1.03	1.04	0.00	1.05
time (sec)	N/A	0.019	0.003	0.029	1.288	0.411	0.169	0.000	3.649

Problem 128	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	46	169	38	0	0	0	54
normalized size	1	1.00	1.00	3.67	0.83	0.00	0.00	0.00	1.17
time (sec)	N/A	0.024	0.011	0.058	1.372	0.449	0.000	0.000	3.506

Problem 129	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	24	123	22	84	0	0	102
normalized size	1	1.00	1.00	5.12	0.92	3.50	0.00	0.00	4.25
time (sec)	N/A	0.025	0.003	0.085	1.323	0.422	0.000	0.000	3.791

Problem 130	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	24	101	22	72	0	0	90
normalized size	1	1.00	1.00	4.21	0.92	3.00	0.00	0.00	3.75
time (sec)	N/A	0.025	0.003	0.067	1.352	0.421	0.000	0.000	3.766

Problem 131	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	81	81	57	79	22	60	0	0	69
normalized size	1	1.00	0.70	0.98	0.27	0.74	0.00	0.00	0.85
time (sec)	N/A	0.089	0.021	0.056	1.483	0.423	0.000	0.000	3.738

Problem 132	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	58	58	44	57	22	47	0	0	57
normalized size	1	1.00	0.76	0.98	0.38	0.81	0.00	0.00	0.98
time (sec)	N/A	0.063	0.015	0.051	1.209	0.415	0.000	0.000	3.650

Problem 133	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	32	35	18	35	0	0	33
normalized size	1	1.00	0.91	1.00	0.51	1.00	0.00	0.00	0.94
time (sec)	N/A	0.036	0.005	0.045	1.217	0.427	0.000	0.000	3.572

Problem 134	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	16	13	13	0	0	13
normalized size	1	1.00	1.00	1.07	0.87	0.87	0.00	0.00	0.87
time (sec)	N/A	0.023	0.002	0.043	1.255	0.425	0.000	0.000	3.504

Problem 135	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	20	19	18	22	29	22	18
normalized size	1	1.00	1.00	0.95	0.90	1.10	1.45	1.10	0.90
time (sec)	N/A	0.021	0.004	0.003	1.008	0.412	0.118	0.186	3.446

Problem 136	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	C	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	32	52	22	34	29	0	36
normalized size	1	1.00	0.73	1.18	0.50	0.77	0.66	0.00	0.82
time (sec)	N/A	0.045	0.008	0.023	1.295	0.417	0.133	0.000	3.444

Problem 137	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	C	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	62	62	45	74	22	47	44	0	47
normalized size	1	1.00	0.73	1.19	0.35	0.76	0.71	0.00	0.76
time (sec)	N/A	0.069	0.009	0.028	1.297	0.420	0.145	0.000	3.552

Problem 138	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	C	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	86	86	58	98	22	60	58	0	60
normalized size	1	1.00	0.67	1.14	0.26	0.70	0.67	0.00	0.70
time (sec)	N/A	0.096	0.011	0.032	1.277	0.403	0.151	0.000	3.631

Problem 139	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	C	A	C	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	69	24	24	121	22	71	71	0	72
normalized size	1	0.35	0.35	1.75	0.32	1.03	1.03	0.00	1.04
time (sec)	N/A	0.022	0.003	0.034	1.272	0.425	0.162	0.000	3.601

Problem 140	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	C	A	C	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	24	24	144	22	84	85	0	84
normalized size	1	0.29	0.29	1.76	0.27	1.02	1.04	0.00	1.02
time (sec)	N/A	0.024	0.003	0.039	1.279	0.421	0.184	0.000	3.613

Problem 141	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	155	28	110	0	0	173
normalized size	1	1.00	1.00	4.56	0.82	3.24	0.00	0.00	5.09
time (sec)	N/A	0.024	0.004	0.131	1.219	0.419	0.000	0.000	3.660

Problem 142	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	133	28	98	0	0	151
normalized size	1	1.00	1.00	3.91	0.82	2.88	0.00	0.00	4.44
time (sec)	N/A	0.024	0.004	0.081	1.340	0.416	0.000	0.000	3.656

Problem 143	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	119	119	86	111	28	86	0	0	129
normalized size	1	1.00	0.72	0.93	0.24	0.72	0.00	0.00	1.08
time (sec)	N/A	0.125	0.037	0.067	1.305	0.425	0.000	0.000	3.661

Problem 144	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	96	96	74	89	28	74	0	0	107
normalized size	1	1.00	0.77	0.93	0.29	0.77	0.00	0.00	1.11
time (sec)	N/A	0.088	0.032	0.060	1.242	0.432	0.000	0.000	3.613

Problem 145	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	73	73	60	67	28	56	0	0	71
normalized size	1	1.00	0.82	0.92	0.38	0.77	0.00	0.00	0.97
time (sec)	N/A	0.061	0.025	0.055	1.275	0.431	0.000	0.000	3.607

Problem 146	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	49	44	26	42	0	0	44
normalized size	1	1.00	1.00	0.90	0.53	0.86	0.00	0.00	0.90
time (sec)	N/A	0.034	0.011	0.049	1.246	0.412	0.000	0.000	3.598

Problem 147	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	39	39	28	34	34	0	0	28
normalized size	1	1.00	1.00	0.72	0.87	0.87	0.00	0.00	0.72
time (sec)	N/A	0.027	0.006	0.049	1.300	0.432	0.000	0.000	3.522

Problem 148	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	63	63	63	58	28	58	0	0	58
normalized size	1	1.00	1.00	0.92	0.44	0.92	0.00	0.00	0.92
time (sec)	N/A	0.053	0.019	0.056	1.491	0.416	0.000	0.000	3.563

Problem 149	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	86	86	74	80	28	76	0	0	79
normalized size	1	1.00	0.86	0.93	0.33	0.88	0.00	0.00	0.92
time (sec)	N/A	0.079	0.052	0.064	1.275	0.421	0.000	0.000	3.594

Problem 150	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	109	109	86	102	28	88	0	0	102
normalized size	1	1.00	0.79	0.94	0.26	0.81	0.00	0.00	0.94
time (sec)	N/A	0.112	0.055	0.073	1.274	0.406	0.000	0.000	3.662

Problem 151	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	132	132	100	124	28	100	0	0	121
normalized size	1	1.00	0.76	0.94	0.21	0.76	0.00	0.00	0.92
time (sec)	N/A	0.160	0.088	0.087	1.311	0.438	0.000	0.000	3.691

Problem 152	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	146	28	112	0	0	142
normalized size	1	1.00	1.00	4.29	0.82	3.29	0.00	0.00	4.18
time (sec)	N/A	0.026	0.005	0.116	1.283	0.439	0.000	0.000	3.705

Problem 153	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	168	28	124	0	0	159
normalized size	1	1.00	1.00	4.94	0.82	3.65	0.00	0.00	4.68
time (sec)	N/A	0.024	0.006	0.151	1.224	0.417	0.000	0.000	3.714

Problem 154	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	46	169	38	0	0	0	54
normalized size	1	1.00	1.00	3.67	0.83	0.00	0.00	0.00	1.17
time (sec)	N/A	0.025	0.011	0.058	1.295	0.424	0.000	0.000	3.468

Problem 155	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	24	249	22	84	0	0	102
normalized size	1	1.00	1.00	10.38	0.92	3.50	0.00	0.00	4.25
time (sec)	N/A	0.028	0.003	0.088	1.626	0.444	0.000	0.000	3.827

Problem 156	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	24	213	22	72	0	0	90
normalized size	1	1.00	1.00	8.88	0.92	3.00	0.00	0.00	3.75
time (sec)	N/A	0.033	0.003	0.079	1.285	0.433	0.000	0.000	3.778

Problem 157	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	81	81	57	177	22	60	0	0	69
normalized size	1	1.00	0.70	2.19	0.27	0.74	0.00	0.00	0.85
time (sec)	N/A	0.115	0.021	0.074	1.267	0.451	0.000	0.000	3.701

Problem 158	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	58	58	44	141	22	47	0	0	57
normalized size	1	1.00	0.76	2.43	0.38	0.81	0.00	0.00	0.98
time (sec)	N/A	0.076	0.015	0.068	1.348	0.460	0.000	0.000	3.655

Problem 159	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	32	97	18	35	0	0	33
normalized size	1	1.00	0.91	2.77	0.51	1.00	0.00	0.00	0.94
time (sec)	N/A	0.048	0.006	0.064	1.246	0.452	0.000	0.000	3.666

Problem 160	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	41	13	13	0	0	13
normalized size	1	1.00	1.00	2.73	0.87	0.87	0.00	0.00	0.87
time (sec)	N/A	0.022	0.002	0.055	1.285	0.430	0.000	0.000	3.591

Problem 161	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	20	19	18	22	29	22	18
normalized size	1	1.00	1.00	0.95	0.90	1.10	1.45	1.10	0.90
time (sec)	N/A	0.022	0.004	0.002	0.927	0.422	0.118	0.210	3.442

Problem 162	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	C	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	32	52	22	34	29	0	36
normalized size	1	1.00	0.73	1.18	0.50	0.77	0.66	0.00	0.82
time (sec)	N/A	0.046	0.007	0.028	1.288	0.418	0.131	0.000	3.494

Problem 163	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	C	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	67	67	45	75	22	47	44	0	48
normalized size	1	1.00	0.67	1.12	0.33	0.70	0.66	0.00	0.72
time (sec)	N/A	0.070	0.009	0.033	1.310	0.413	0.143	0.000	3.541

Problem 164	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	C	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	83	83	58	97	22	60	58	0	60
normalized size	1	1.00	0.70	1.17	0.27	0.72	0.70	0.00	0.72
time (sec)	N/A	0.094	0.010	0.041	1.279	0.424	0.158	0.000	3.537

Problem 165	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	C	A	C	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	69	24	24	121	22	71	71	0	72
normalized size	1	0.35	0.35	1.75	0.32	1.03	1.03	0.00	1.04
time (sec)	N/A	0.023	0.003	0.044	1.388	0.420	0.168	0.000	3.516

Problem 166	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	C	A	C	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	24	24	84	22	84	85	0	84
normalized size	1	0.29	0.29	1.02	0.27	1.02	1.04	0.00	1.02
time (sec)	N/A	0.023	0.003	0.031	1.127	0.413	0.180	0.000	3.592

Problem 167	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	120	28	55	0	0	88
normalized size	1	1.00	1.00	3.53	0.82	1.62	0.00	0.00	2.59
time (sec)	N/A	0.025	0.004	0.060	1.330	0.432	0.000	0.000	3.573

Problem 168	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	115	28	51	0	0	80
normalized size	1	1.00	1.00	3.38	0.82	1.50	0.00	0.00	2.35
time (sec)	N/A	0.025	0.004	0.059	1.281	0.438	0.000	0.000	3.588

Problem 169	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	105	28	41	0	0	70
normalized size	1	1.00	1.00	3.09	0.82	1.21	0.00	0.00	2.06
time (sec)	N/A	0.014	0.004	0.055	1.303	0.426	0.000	0.000	3.572

Problem 170	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	32	98	26	38	0	0	48
normalized size	1	1.00	1.00	3.06	0.81	1.19	0.00	0.00	1.50
time (sec)	N/A	0.005	0.003	0.051	1.239	0.431	0.000	0.000	3.587

Problem 171	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	82	28	29	0	0	46
normalized size	1	1.00	1.00	2.41	0.82	0.85	0.00	0.00	1.35
time (sec)	N/A	0.024	0.006	0.056	1.383	0.420	0.000	0.000	3.582

Problem 172	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	78	28	29	0	0	33
normalized size	1	1.00	1.00	2.29	0.82	0.85	0.00	0.00	0.97
time (sec)	N/A	0.022	0.005	0.055	1.400	0.427	0.000	0.000	3.562

Problem 173	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	112	28	53	0	0	77
normalized size	1	1.00	1.00	3.29	0.82	1.56	0.00	0.00	2.26
time (sec)	N/A	0.023	0.005	0.065	1.043	0.428	0.000	0.000	3.536

Problem 174	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	F	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	46	0	47	0	0	0	79
normalized size	1	1.00	1.00	0.00	1.02	0.00	0.00	0.00	1.72
time (sec)	N/A	0.026	0.013	0.077	1.166	0.410	0.000	0.000	3.763

Problem 175	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	39	39	0	41	0	0	0	54
normalized size	1	1.00	1.00	0.00	1.05	0.00	0.00	0.00	1.38
time (sec)	N/A	0.025	0.007	0.039	1.051	0.417	0.000	0.000	3.608

Problem 176	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	39	39	0	41	0	0	0	54
normalized size	1	1.00	1.00	0.00	1.05	0.00	0.00	0.00	1.38
time (sec)	N/A	0.025	0.006	0.064	0.955	0.419	0.000	0.000	3.506

Problem 177	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	39	39	0	41	0	0	0	-1
normalized size	1	1.00	1.00	0.00	1.05	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.015	0.006	0.059	1.076	0.417	0.000	0.000	0.000

Problem 178	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	35	0	35	0	0	0	-1
normalized size	1	1.00	1.00	0.00	1.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.004	0.005	0.050	1.088	0.417	0.000	0.000	0.000

Problem 179	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	19	15	15	0	0	-1
normalized size	1	1.00	1.00	1.27	1.00	1.00	0.00	0.00	-0.07
time (sec)	N/A	0.023	0.003	0.210	0.941	0.411	0.000	0.000	0.000

Problem 180	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	37	37	37	0	37	0	0	0	52
normalized size	1	1.00	1.00	0.00	1.00	0.00	0.00	0.00	1.41
time (sec)	N/A	0.024	0.004	0.065	1.233	0.424	0.000	0.000	3.531

Problem 181	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	39	39	0	39	0	0	0	48
normalized size	1	1.00	1.00	0.00	1.00	0.00	0.00	0.00	1.23
time (sec)	N/A	0.025	0.004	0.036	1.163	0.403	0.000	0.000	3.518

Problem 182	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	39	39	0	39	0	0	0	52
normalized size	1	1.00	1.00	0.00	1.00	0.00	0.00	0.00	1.33
time (sec)	N/A	0.024	0.004	0.035	1.138	0.398	0.000	0.000	3.478

Problem 183	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	71	71	24	44	51	47	0	0	-1
normalized size	1	1.00	0.34	0.62	0.72	0.66	0.00	0.00	-0.01
time (sec)	N/A	0.076	0.004	0.020	0.693	0.406	0.000	0.000	0.000

Problem 184	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	45	45	25	56	34	33	0	0	-1
normalized size	1	1.00	0.56	1.24	0.76	0.73	0.00	0.00	-0.02
time (sec)	N/A	0.048	0.006	0.053	0.783	0.423	0.000	0.000	0.000

Problem 185	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	20	25	20	24	39	20	20
normalized size	1	1.00	1.00	1.25	1.00	1.20	1.95	1.00	1.00
time (sec)	N/A	0.023	0.005	0.037	0.658	0.416	67.277	0.224	3.504

Problem 186	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	19	15	15	0	0	-1
normalized size	1	1.00	1.00	1.27	1.00	1.00	0.00	0.00	-0.07
time (sec)	N/A	0.023	0.003	0.032	0.899	0.411	0.000	0.000	0.000

Problem 187	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	20	43	20	43	0	0	-1
normalized size	1	1.00	0.53	1.13	0.53	1.13	0.00	0.00	-0.03
time (sec)	N/A	0.049	0.004	0.115	1.029	0.409	0.000	0.000	0.000

Problem 188	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	71	71	25	70	25	61	0	0	-1
normalized size	1	1.00	0.35	0.99	0.35	0.86	0.00	0.00	-0.01
time (sec)	N/A	0.075	0.004	0.127	1.014	0.414	0.000	0.000	0.000

Problem 189	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	104	104	39	96	33	82	0	0	-1
normalized size	1	1.00	0.38	0.92	0.32	0.79	0.00	0.00	-0.01
time (sec)	N/A	0.110	0.011	0.108	1.213	0.439	0.000	0.000	0.000

Problem 190	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	74	74	39	67	33	64	0	0	-1
normalized size	1	1.00	0.53	0.91	0.45	0.86	0.00	0.00	-0.01
time (sec)	N/A	0.065	0.009	0.088	1.075	0.433	0.000	0.000	0.000

Problem 191	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-1)	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	43	32	38	42	0	33	-1
normalized size	1	1.00	1.00	0.74	0.88	0.98	0.00	0.77	-0.02
time (sec)	N/A	0.036	0.009	0.104	0.938	0.419	0.000	0.275	0.000

Problem 192	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	66	66	39	59	35	83	0	0	-1
normalized size	1	1.00	0.59	0.89	0.53	1.26	0.00	0.00	-0.02
time (sec)	N/A	0.065	0.007	0.118	0.975	0.419	0.000	0.000	0.000

Problem 193	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	96	96	39	88	35	0	0	0	-1
normalized size	1	1.00	0.41	0.92	0.36	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.096	0.008	0.102	1.038	0.449	0.000	0.000	0.000

Problem 194	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F(-2)	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	11	10	9	0	10	10	9
normalized size	1	1.00	0.69	0.62	0.56	0.00	0.62	0.62	0.56
time (sec)	N/A	0.008	0.005	0.004	0.518	0.000	0.090	0.211	0.029

Problem 195	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	203	203	96	249	264	113	0	136	171
normalized size	1	1.00	0.47	1.23	1.30	0.56	0.00	0.67	0.84
time (sec)	N/A	0.229	0.110	0.092	1.703	0.424	0.000	0.259	3.558

Problem 196	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	140	140	83	168	218	95	0	107	121
normalized size	1	1.00	0.59	1.20	1.56	0.68	0.00	0.76	0.86
time (sec)	N/A	0.129	0.069	0.057	1.316	0.423	0.000	0.251	3.612

Problem 197	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	63	80	131	72	0	77	66
normalized size	1	1.00	0.93	1.18	1.93	1.06	0.00	1.13	0.97
time (sec)	N/A	0.058	0.030	0.053	1.266	0.448	0.000	0.250	3.482

Problem 198	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	41	41	41	41	40	45	0	33	45
normalized size	1	1.00	1.00	1.00	0.98	1.10	0.00	0.80	1.10
time (sec)	N/A	0.008	0.004	0.048	0.595	0.424	0.000	0.204	0.044

Problem 199	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	18	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.06
time (sec)	N/A	0.026	0.122	0.035	0.000	0.429	0.000	0.000	0.000

Problem 200	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	78	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.058	0.320	0.043	0.000	0.423	0.000	0.000	0.000

Problem 201	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	137	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.097	0.428	0.049	0.000	0.423	0.000	0.000	0.000

Problem 202	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	120	120	111	0	0	155	0	0	-1
normalized size	1	1.00	0.92	0.00	0.00	1.29	0.00	0.00	-0.01
time (sec)	N/A	0.089	0.204	0.043	0.000	0.464	0.000	0.000	0.000

Problem 203	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	92	92	86	0	0	114	0	0	-1
normalized size	1	1.00	0.93	0.00	0.00	1.24	0.00	0.00	-0.01
time (sec)	N/A	0.049	0.053	0.039	0.000	0.439	0.000	0.000	0.000

Problem 204	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	44	0	0	60	0	0	-1
normalized size	1	1.00	1.00	0.00	0.00	1.36	0.00	0.00	-0.02
time (sec)	N/A	0.006	0.010	0.035	0.000	0.421	0.000	0.000	0.000

Problem 205	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	18	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.06
time (sec)	N/A	0.017	0.302	0.036	0.000	0.418	0.000	0.000	0.000

Problem 206	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	133	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.302	1.108	0.045	0.000	0.427	0.000	0.000	0.000

Problem 207	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	263	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.449	1.478	0.047	0.000	0.442	0.000	0.000	0.000

Problem 208	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	183	183	164	0	0	158	0	0	-1
normalized size	1	1.00	0.90	0.00	0.00	0.86	0.00	0.00	-0.01
time (sec)	N/A	0.183	0.179	0.047	0.000	0.468	0.000	0.000	0.000

Problem 209	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	138	138	138	0	0	141	0	0	-1
normalized size	1	1.00	1.00	0.00	0.00	1.02	0.00	0.00	-0.01
time (sec)	N/A	0.149	0.142	0.038	0.000	0.422	0.000	0.000	0.000

Problem 210	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	99	99	89	0	0	124	0	0	-1
normalized size	1	1.00	0.90	0.00	0.00	1.25	0.00	0.00	-0.01
time (sec)	N/A	0.121	0.083	0.037	0.000	0.459	0.000	0.000	0.000

Problem 211	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	74	0	0	89	0	0	-1
normalized size	1	1.00	0.92	0.00	0.00	1.11	0.00	0.00	-0.01
time (sec)	N/A	0.068	0.032	0.032	0.000	0.429	0.000	0.000	0.000

Problem 212	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	38	0	0	44	0	0	-1
normalized size	1	1.00	1.00	0.00	0.00	1.16	0.00	0.00	-0.03
time (sec)	N/A	0.009	0.006	0.031	0.000	0.432	0.000	0.000	0.000

Problem 213	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	36	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.093	0.245	0.029	0.000	0.405	0.000	0.000	0.000

Problem 214	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	36	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.092	0.190	0.046	0.000	0.416	0.000	0.000	0.000

Problem 215	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	26	29	19	19	34	19	19
normalized size	1	1.00	0.65	0.72	0.48	0.48	0.85	0.48	0.48
time (sec)	N/A	0.012	0.012	0.009	0.735	0.414	0.208	0.209	0.094

Problem 216	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	291	291	241	517	0	243	0	0	-1
normalized size	1	1.00	0.83	1.78	0.00	0.84	0.00	0.00	-0.00
time (sec)	N/A	0.288	0.202	0.131	0.000	0.432	0.000	0.000	0.000

Problem 217	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	269	269	179	359	0	171	0	0	-1
normalized size	1	1.00	0.67	1.33	0.00	0.64	0.00	0.00	-0.00
time (sec)	N/A	0.254	0.200	0.122	0.000	0.423	0.000	0.000	0.000

Problem 218	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	229	229	128	227	0	114	0	0	209
normalized size	1	1.00	0.56	0.99	0.00	0.50	0.00	0.00	0.91
time (sec)	N/A	0.223	0.127	0.116	0.000	0.454	0.000	0.000	3.927

Problem 219	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	120	120	82	126	0	71	0	0	136
normalized size	1	1.00	0.68	1.05	0.00	0.59	0.00	0.00	1.13
time (sec)	N/A	0.116	0.069	0.111	0.000	0.425	0.000	0.000	3.647

Problem 220	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	41	41	41	52	0	40	0	0	50
normalized size	1	1.00	1.00	1.27	0.00	0.98	0.00	0.00	1.22
time (sec)	N/A	0.029	0.016	0.099	0.000	0.425	0.000	0.000	3.549

Problem 221	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	41	41	41	47	0	41	0	0	-1
normalized size	1	1.00	1.00	1.15	0.00	1.00	0.00	0.00	-0.02
time (sec)	N/A	0.131	0.035	0.142	0.000	0.427	0.000	0.000	0.000

Problem 222	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	68	80	0	60	0	0	-1
normalized size	1	1.00	1.00	1.18	0.00	0.88	0.00	0.00	-0.01
time (sec)	N/A	0.397	0.110	0.121	0.000	0.450	0.000	0.000	0.000

Problem 223	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	166	166	115	226	0	110	0	0	-1
normalized size	1	1.00	0.69	1.36	0.00	0.66	0.00	0.00	-0.01
time (sec)	N/A	0.718	0.194	0.127	0.000	0.437	0.000	0.000	0.000

Problem 224	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	415	415	195	343	0	201	0	0	-1
normalized size	1	1.00	0.47	0.83	0.00	0.48	0.00	0.00	-0.00
time (sec)	N/A	0.435	0.222	0.114	0.000	0.451	0.000	0.000	0.000

Problem 225	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	291	291	148	228	0	156	0	0	-1
normalized size	1	1.00	0.51	0.78	0.00	0.54	0.00	0.00	-0.00
time (sec)	N/A	0.304	0.150	0.079	0.000	0.474	0.000	0.000	0.000

Problem 226	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	206	206	131	175	0	128	0	0	-1
normalized size	1	1.00	0.64	0.85	0.00	0.62	0.00	0.00	-0.00
time (sec)	N/A	0.215	0.115	0.073	0.000	0.439	0.000	0.000	0.000

Problem 227	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	111	111	89	93	0	107	0	0	-1
normalized size	1	1.00	0.80	0.84	0.00	0.96	0.00	0.00	-0.01
time (sec)	N/A	0.119	0.054	0.066	0.000	0.424	0.000	0.000	0.000

Problem 228	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	62	62	62	65	0	68	0	0	53
normalized size	1	1.00	1.00	1.05	0.00	1.10	0.00	0.00	0.85
time (sec)	N/A	0.039	0.021	0.058	0.000	0.447	0.000	0.000	3.640

Problem 229	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	18	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.06
time (sec)	N/A	0.018	0.072	0.063	0.000	0.425	0.000	0.000	0.000

Problem 230	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	18	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.06
time (sec)	N/A	0.043	0.235	0.081	0.000	0.434	0.000	0.000	0.000

Problem 231	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	18	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.06
time (sec)	N/A	0.038	0.293	0.099	0.000	0.409	0.000	0.000	0.000

Problem 232	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	239	239	219	0	0	248	0	0	-1
normalized size	1	1.00	0.92	0.00	0.00	1.04	0.00	0.00	-0.00
time (sec)	N/A	0.201	0.193	0.076	0.000	0.427	0.000	0.000	0.000

Problem 233	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	184	184	167	0	0	221	0	0	-1
normalized size	1	1.00	0.91	0.00	0.00	1.20	0.00	0.00	-0.01
time (sec)	N/A	0.149	0.372	0.070	0.000	0.452	0.000	0.000	0.000

Problem 234	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	142	142	127	0	0	194	0	0	-1
normalized size	1	1.00	0.89	0.00	0.00	1.37	0.00	0.00	-0.01
time (sec)	N/A	0.118	0.067	0.066	0.000	0.469	0.000	0.000	0.000

Problem 235	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	92	92	86	0	0	154	0	0	-1
normalized size	1	1.00	0.93	0.00	0.00	1.67	0.00	0.00	-0.01
time (sec)	N/A	0.052	0.069	0.061	0.000	0.442	0.000	0.000	0.000

Problem 236	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	44	0	0	94	0	0	68
normalized size	1	1.00	1.00	0.00	0.00	2.14	0.00	0.00	1.55
time (sec)	N/A	0.005	0.008	0.049	0.000	0.494	0.000	0.000	3.970

Problem 237	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	18	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.06
time (sec)	N/A	0.018	0.062	0.059	0.000	0.447	0.000	0.000	0.000

Problem 238	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	18	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.06
time (sec)	N/A	0.043	0.292	0.071	0.000	0.450	0.000	0.000	0.000

Problem 239	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	18	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.06
time (sec)	N/A	0.038	0.037	0.089	0.000	0.413	0.000	0.000	0.000

Problem 240	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	18	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.06
time (sec)	N/A	0.047	0.246	0.062	0.000	0.427	0.000	0.000	0.000

Problem 241	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.056	0.148	0.055	0.000	0.429	0.000	0.000	0.000

Problem 242	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	41	41	36	117	36	39	0	0	41
normalized size	1	1.00	0.88	2.85	0.88	0.95	0.00	0.00	1.00
time (sec)	N/A	0.022	0.015	0.053	1.339	0.447	0.000	0.000	3.504

Problem 243	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	18	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.06
time (sec)	N/A	0.039	0.046	0.060	0.000	0.446	0.000	0.000	0.000

Problem 244	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	18	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.06
time (sec)	N/A	0.042	0.088	0.065	0.000	0.433	0.000	0.000	0.000

Problem 245	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	18	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.06
time (sec)	N/A	0.043	0.080	0.070	0.000	0.433	0.000	0.000	0.000

Problem 246	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	18	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.06
time (sec)	N/A	0.052	0.054	0.038	0.000	0.449	0.000	0.000	0.000

Problem 247	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	207	207	183	0	0	0	0	0	-1
normalized size	1	1.00	0.88	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.157	0.160	0.028	0.000	0.447	0.000	0.000	0.000

Problem 248	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	154	154	136	0	0	0	0	0	-1
normalized size	1	1.00	0.88	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.108	0.083	0.063	0.000	0.462	0.000	0.000	0.000

Problem 249	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	99	99	91	0	0	0	0	0	-1
normalized size	1	1.00	0.92	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.058	0.038	0.053	0.000	0.437	0.000	0.000	0.000

Problem 250	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	47	0	0	0	0	0	-1
normalized size	1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.006	0.007	0.040	0.000	0.432	0.000	0.000	0.000

Problem 251	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	18	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.06
time (sec)	N/A	0.022	0.042	0.038	0.000	0.435	0.000	0.000	0.000

Problem 252	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	18	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.06
time (sec)	N/A	0.046	0.034	0.063	0.000	0.410	0.000	0.000	0.000

Problem 253	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	18	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.06
time (sec)	N/A	0.045	0.036	0.026	0.000	0.429	0.000	0.000	0.000

Problem 254	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	61	61	61	0	0	59	0	0	75
normalized size	1	1.00	1.00	0.00	0.00	0.97	0.00	0.00	1.23
time (sec)	N/A	0.065	0.038	0.095	0.000	0.422	0.000	0.000	3.805

Problem 255	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	C	B	C	B	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	105	31	31	579	5261	468	796	145	553
normalized size	1	0.30	0.30	5.51	50.10	4.46	7.58	1.38	5.27
time (sec)	N/A	0.073	0.009	0.020	15.454	0.470	0.552	0.339	4.149

Problem 256	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	C	B	C	B	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	88	31	31	396	3727	324	558	124	391
normalized size	1	0.35	0.35	4.50	42.35	3.68	6.34	1.41	4.44
time (sec)	N/A	0.069	0.009	0.016	14.671	0.431	0.434	0.363	3.937

Problem 257	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	C	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	126	126	72	249	2452	208	366	103	253
normalized size	1	1.00	0.57	1.98	19.46	1.65	2.90	0.82	2.01
time (sec)	N/A	0.256	0.043	0.012	10.236	0.405	0.335	0.313	3.825

Problem 258	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	C	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	91	91	56	138	1438	120	214	82	142
normalized size	1	1.00	0.62	1.52	15.80	1.32	2.35	0.90	1.56
time (sec)	N/A	0.176	0.033	0.010	6.917	0.428	0.257	0.295	3.661

Problem 259	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	C	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	62	62	40	63	683	60	100	1186	67
normalized size	1	1.00	0.65	1.02	11.02	0.97	1.61	19.13	1.08
time (sec)	N/A	0.105	0.022	0.009	4.150	0.445	0.192	0.350	3.546

Problem 260	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	27	36	25	35	36	35	25
normalized size	1	1.00	1.00	1.33	0.93	1.30	1.33	1.30	0.93
time (sec)	N/A	0.036	0.006	0.007	1.194	0.426	0.144	0.192	3.521

Problem 261	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	22	23	0	32	0	0	20
normalized size	1	1.00	1.00	1.05	0.00	1.45	0.00	0.00	0.91
time (sec)	N/A	0.068	0.006	0.044	0.000	0.522	0.000	0.000	3.678

Problem 262	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	53	53	47	53	0	100	0	0	51
normalized size	1	1.00	0.89	1.00	0.00	1.89	0.00	0.00	0.96
time (sec)	N/A	0.132	0.039	0.056	0.000	0.430	0.000	0.000	4.682

Problem 263	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	87	87	64	86	0	183	0	0	76
normalized size	1	1.00	0.74	0.99	0.00	2.10	0.00	0.00	0.87
time (sec)	N/A	0.198	0.074	0.070	0.000	0.421	0.000	0.000	5.757

Problem 264	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	121	121	79	119	0	292	0	0	104
normalized size	1	1.00	0.65	0.98	0.00	2.41	0.00	0.00	0.86
time (sec)	N/A	0.258	0.089	0.089	0.000	0.430	0.000	0.000	3.817

Problem 265	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	31	152	0	430	0	0	120
normalized size	1	1.00	1.00	4.90	0.00	13.87	0.00	0.00	3.87
time (sec)	N/A	0.063	0.007	0.124	0.000	0.425	0.000	0.000	3.814

Problem 266	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	31	185	0	596	0	0	136
normalized size	1	1.00	1.00	5.97	0.00	19.23	0.00	0.00	4.39
time (sec)	N/A	0.064	0.007	0.169	0.000	0.458	0.000	0.000	3.905

Problem 267	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	49	1896	6135	617	0	195	209
normalized size	1	1.00	1.00	38.69	125.20	12.59	0.00	3.98	4.27
time (sec)	N/A	0.066	0.027	0.506	22.535	0.436	0.000	0.369	4.024

Problem 268	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	49	1359	4471	456	0	174	730
normalized size	1	1.00	1.00	27.73	91.24	9.31	0.00	3.55	14.90
time (sec)	N/A	0.067	0.025	0.250	16.750	0.526	0.000	0.350	4.130

Problem 269	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	179	179	153	914	3066	323	0	153	533
normalized size	1	1.00	0.85	5.11	17.13	1.80	0.00	0.85	2.98
time (sec)	N/A	0.331	0.380	0.162	12.510	0.621	0.000	0.307	3.911

Problem 270	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	145	145	126	561	1922	218	0	132	378
normalized size	1	1.00	0.87	3.87	13.26	1.50	0.00	0.91	2.61
time (sec)	N/A	0.230	0.148	0.113	8.451	0.652	0.000	0.308	3.772

Problem 271	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	111	111	90	300	1037	141	0	111	243
normalized size	1	1.00	0.81	2.70	9.34	1.27	0.00	1.00	2.19
time (sec)	N/A	0.154	0.096	0.088	5.272	0.676	0.000	0.292	3.596

Problem 272	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	77	77	77	131	413	88	0	91	130
normalized size	1	1.00	1.00	1.70	5.36	1.14	0.00	1.18	1.69
time (sec)	N/A	0.082	0.046	0.073	3.673	0.665	0.000	0.272	3.588

Problem 273	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	44	58	58	48	0	36	48
normalized size	1	1.00	1.00	1.32	1.32	1.09	0.00	0.82	1.09
time (sec)	N/A	0.011	0.006	0.053	0.964	0.444	0.000	0.198	0.040

Problem 274	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	67	67	63	62	0	83	0	0	86
normalized size	1	1.00	0.94	0.93	0.00	1.24	0.00	0.00	1.28
time (sec)	N/A	0.079	0.046	0.079	0.000	0.426	0.000	0.000	4.055

Problem 275	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	102	102	81	96	0	163	0	0	201
normalized size	1	1.00	0.79	0.94	0.00	1.60	0.00	0.00	1.97
time (sec)	N/A	0.145	0.103	0.078	0.000	0.435	0.000	0.000	5.027

Problem 276	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	136	136	97	129	0	288	0	0	168
normalized size	1	1.00	0.71	0.95	0.00	2.12	0.00	0.00	1.24
time (sec)	N/A	0.219	0.120	0.090	0.000	0.440	0.000	0.000	4.868

Problem 277	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	170	170	112	162	0	429	0	0	201
normalized size	1	1.00	0.66	0.95	0.00	2.52	0.00	0.00	1.18
time (sec)	N/A	0.286	0.146	0.122	0.000	0.436	0.000	0.000	4.128

Problem 278	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	49	195	0	598	0	0	234
normalized size	1	1.00	1.00	3.98	0.00	12.20	0.00	0.00	4.78
time (sec)	N/A	0.061	0.031	0.155	0.000	0.473	0.000	0.000	4.086

Problem 279	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	49	228	0	795	0	0	267
normalized size	1	1.00	1.00	4.65	0.00	16.22	0.00	0.00	5.45
time (sec)	N/A	0.062	0.031	0.219	0.000	0.453	0.000	0.000	4.153

Problem 280	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	61	61	61	0	0	71	0	0	75
normalized size	1	1.00	1.00	0.00	0.00	1.16	0.00	0.00	1.23
time (sec)	N/A	0.061	0.042	0.098	0.000	0.455	0.000	0.000	3.678

Problem 281	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	C	B	B	B	A	F(-2)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	105	31	31	857	1268	688	1171	0	685
normalized size	1	0.30	0.30	8.16	12.08	6.55	11.15	0.00	6.52
time (sec)	N/A	0.067	0.011	0.022	2.363	0.441	0.793	0.000	4.370

Problem 282	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	C	B	B	B	A	F(-2)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	88	31	31	584	874	474	823	0	487
normalized size	1	0.35	0.35	6.64	9.93	5.39	9.35	0.00	5.53
time (sec)	N/A	0.067	0.010	0.020	2.289	0.453	0.609	0.000	4.078

Problem 283	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	124	124	75	365	555	302	537	1320	323
normalized size	1	1.00	0.60	2.94	4.48	2.44	4.33	10.65	2.60
time (sec)	N/A	0.284	0.064	0.014	2.245	0.427	0.459	0.509	3.871

Problem 284	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	96	96	56	200	308	172	306	705	196
normalized size	1	1.00	0.58	2.08	3.21	1.79	3.19	7.34	2.04
time (sec)	N/A	0.209	0.042	0.013	2.127	0.427	0.335	0.452	3.663

Problem 285	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	62	62	40	89	133	84	144	891	95
normalized size	1	1.00	0.65	1.44	2.15	1.35	2.32	14.37	1.53
time (sec)	N/A	0.138	0.026	0.010	2.092	0.436	0.239	0.389	3.627

Problem 286	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	27	48	25	47	46	47	25
normalized size	1	1.00	1.00	1.78	0.93	1.74	1.70	1.74	0.93
time (sec)	N/A	0.067	0.008	0.009	0.883	0.423	0.177	0.235	3.533

Problem 287	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	22	0	0	44	0	0	20
normalized size	1	1.00	1.00	0.00	0.00	2.00	0.00	0.00	0.91
time (sec)	N/A	0.066	0.007	0.093	0.000	0.428	0.000	0.000	3.580

Problem 288	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	53	53	47	0	0	147	0	0	51
normalized size	1	1.00	0.89	0.00	0.00	2.77	0.00	0.00	0.96
time (sec)	N/A	0.125	0.031	0.094	0.000	0.457	0.000	0.000	3.921

Problem 289	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	87	87	64	0	0	269	0	0	76
normalized size	1	1.00	0.74	0.00	0.00	3.09	0.00	0.00	0.87
time (sec)	N/A	0.193	0.076	0.100	0.000	0.444	0.000	0.000	4.884

Problem 290	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	121	121	80	0	0	431	0	0	104
normalized size	1	1.00	0.66	0.00	0.00	3.56	0.00	0.00	0.86
time (sec)	N/A	0.260	0.100	0.135	0.000	0.425	0.000	0.000	3.871

Problem 291	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	31	0	0	636	0	0	120
normalized size	1	1.00	1.00	0.00	0.00	20.52	0.00	0.00	3.87
time (sec)	N/A	0.061	0.008	0.178	0.000	0.482	0.000	0.000	4.033

Problem 292	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	31	0	0	883	0	0	136
normalized size	1	1.00	1.00	0.00	0.00	28.48	0.00	0.00	4.39
time (sec)	N/A	0.062	0.008	0.239	0.000	0.447	0.000	0.000	4.303

Problem 293	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	49	0	0	118	0	0	112
normalized size	1	1.00	1.00	0.00	0.00	2.41	0.00	0.00	2.29
time (sec)	N/A	0.064	0.026	0.088	0.000	0.444	0.000	0.000	3.918

Problem 294	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	49	0	0	63	0	0	-1
normalized size	1	1.00	1.00	0.00	0.00	1.29	0.00	0.00	-0.02
time (sec)	N/A	0.041	0.023	0.057	0.000	0.433	0.000	0.000	0.000

Problem 295	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	47	0	0	63	0	0	-1
normalized size	1	1.00	1.00	0.00	0.00	1.34	0.00	0.00	-0.02
time (sec)	N/A	0.007	0.017	0.036	0.000	0.451	0.000	0.000	0.000

Problem 296	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	49	0	0	110	0	0	74
normalized size	1	1.00	1.00	0.00	0.00	2.24	0.00	0.00	1.51
time (sec)	N/A	0.064	0.016	0.096	0.000	0.437	0.000	0.000	3.730

Problem 297	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F(-1)	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	49	0	0	135	0	0	87
normalized size	1	1.00	1.00	0.00	0.00	2.76	0.00	0.00	1.78
time (sec)	N/A	0.063	0.016	0.092	0.000	0.426	0.000	0.000	3.829

Problem 298	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	49	0	0	226	0	0	130
normalized size	1	1.00	1.00	0.00	0.00	4.61	0.00	0.00	2.65
time (sec)	N/A	0.063	0.024	0.095	0.000	0.445	0.000	0.000	4.466

Problem 299	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	64	64	42	0	43	42	76	774	38
normalized size	1	1.00	0.66	0.00	0.67	0.66	1.19	12.09	0.59
time (sec)	N/A	0.032	0.034	0.007	0.637	0.411	0.720	0.399	3.596

Problem 300	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	100	100	60	0	62	58	0	1336	54
normalized size	1	1.00	0.60	0.00	0.62	0.58	0.00	13.36	0.54
time (sec)	N/A	0.064	0.043	0.006	0.587	0.419	0.000	0.493	3.577

Problem 301	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	50	50	50	0	0	0	0	0	73
normalized size	1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	1.46
time (sec)	N/A	0.044	0.019	0.100	0.000	0.432	0.000	0.000	3.668

Problem 302	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	29	29	29	534	0	244	0	0	181
normalized size	1	1.00	1.00	18.41	0.00	8.41	0.00	0.00	6.24
time (sec)	N/A	0.045	0.007	0.141	0.000	0.431	0.000	0.000	3.672

Problem 303	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	28	368	0	175	0	0	148
normalized size	1	1.00	1.00	13.14	0.00	6.25	0.00	0.00	5.29
time (sec)	N/A	0.044	0.006	0.134	0.000	0.433	0.000	0.000	3.705

Problem 304	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	119	119	76	234	0	120	0	0	89
normalized size	1	1.00	0.64	1.97	0.00	1.01	0.00	0.00	0.75
time (sec)	N/A	0.133	0.071	0.131	0.000	0.427	0.000	0.000	3.880

Problem 305	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	85	85	58	133	0	77	0	0	82
normalized size	1	1.00	0.68	1.56	0.00	0.91	0.00	0.00	0.96
time (sec)	N/A	0.080	0.047	0.127	0.000	0.470	0.000	0.000	6.115

Problem 306	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	42	61	0	51	0	0	47
normalized size	1	1.00	0.91	1.33	0.00	1.11	0.00	0.00	1.02
time (sec)	N/A	0.052	0.025	0.125	0.000	0.417	0.000	0.000	4.401

Problem 307	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	20	22	0	20	0	0	20
normalized size	1	1.00	1.00	1.10	0.00	1.00	0.00	0.00	1.00
time (sec)	N/A	0.044	0.005	0.122	0.000	0.420	0.000	0.000	3.757

Problem 308	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	25	25	25	26	25	31	34	31	25
normalized size	1	1.00	1.00	1.04	1.00	1.24	1.36	1.24	1.00
time (sec)	N/A	0.042	0.007	0.005	0.900	0.406	0.243	0.248	5.042

Problem 309	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	57	57	41	106	0	51	44	0	41
normalized size	1	1.00	0.72	1.86	0.00	0.89	0.77	0.00	0.72
time (sec)	N/A	0.085	0.018	0.033	0.000	0.420	0.222	0.000	6.233

Problem 310	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	90	90	60	169	0	95	102	0	104
normalized size	1	1.00	0.67	1.88	0.00	1.06	1.13	0.00	1.16
time (sec)	N/A	0.133	0.025	0.043	0.000	0.399	0.263	0.000	5.622

Problem 311	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	122	122	76	243	0	150	177	0	161
normalized size	1	1.00	0.62	1.99	0.00	1.23	1.45	0.00	1.32
time (sec)	N/A	0.185	0.035	0.052	0.000	0.400	0.306	0.000	3.801

Problem 312	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	C	B	F	B	B	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	92	29	29	329	0	219	272	0	231
normalized size	1	0.32	0.32	3.58	0.00	2.38	2.96	0.00	2.51
time (sec)	N/A	0.049	0.006	0.061	0.000	0.410	0.354	0.000	3.880

Problem 313	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	C	B	F	B	B	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	108	28	28	427	0	302	388	0	315
normalized size	1	0.26	0.26	3.95	0.00	2.80	3.59	0.00	2.92
time (sec)	N/A	0.053	0.006	0.081	0.000	0.433	0.404	0.000	3.942

Problem 314	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	61	61	61	0	0	0	0	0	73
normalized size	1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	1.20
time (sec)	N/A	0.054	0.035	0.110	0.000	0.430	0.000	0.000	3.758

Problem 315	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	31	961	0	465	0	0	136
normalized size	1	1.00	1.00	31.00	0.00	15.00	0.00	0.00	4.39
time (sec)	N/A	0.052	0.008	0.130	0.000	0.421	0.000	0.000	3.955

Problem 316	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	31	646	0	331	0	0	120
normalized size	1	1.00	1.00	20.84	0.00	10.68	0.00	0.00	3.87
time (sec)	N/A	0.051	0.008	0.097	0.000	0.441	0.000	0.000	3.845

Problem 317	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	121	121	96	395	0	225	0	0	92
normalized size	1	1.00	0.79	3.26	0.00	1.86	0.00	0.00	0.76
time (sec)	N/A	0.186	0.171	0.080	0.000	0.450	0.000	0.000	3.777

Problem 318	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	87	87	71	208	0	145	0	0	76
normalized size	1	1.00	0.82	2.39	0.00	1.67	0.00	0.00	0.87
time (sec)	N/A	0.124	0.044	0.069	0.000	0.461	0.000	0.000	3.700

Problem 319	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	53	53	47	86	0	96	0	0	51
normalized size	1	1.00	0.89	1.62	0.00	1.81	0.00	0.00	0.96
time (sec)	N/A	0.071	0.024	0.061	0.000	0.438	0.000	0.000	5.449

Problem 320	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	22	23	0	31	0	0	20
normalized size	1	1.00	1.00	1.05	0.00	1.41	0.00	0.00	0.91
time (sec)	N/A	0.045	0.006	0.056	0.000	0.421	0.000	0.000	3.699

Problem 321	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	27	26	25	54	54	54	37
normalized size	1	1.00	1.00	0.96	0.93	2.00	2.00	2.00	1.37
time (sec)	N/A	0.043	0.009	0.004	0.885	0.396	0.337	0.261	3.542

Problem 322	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	62	62	47	185	101	100	82	0	97
normalized size	1	1.00	0.76	2.98	1.63	1.61	1.32	0.00	1.56
time (sec)	N/A	0.087	0.025	0.054	0.982	0.407	0.306	0.000	3.715

Problem 323	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	91	91	64	301	208	180	189	1656	183
normalized size	1	1.00	0.70	3.31	2.29	1.98	2.08	18.20	2.01
time (sec)	N/A	0.137	0.034	0.084	1.010	0.408	0.388	0.558	3.957

Problem 324	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	B	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	126	126	81	444	349	287	333	0	292
normalized size	1	1.00	0.64	3.52	2.77	2.28	2.64	0.00	2.32
time (sec)	N/A	0.191	0.045	0.119	1.082	0.420	0.476	0.000	4.249

Problem 325	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	C	B	B	B	B	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	96	31	31	609	526	420	518	0	427
normalized size	1	0.32	0.32	6.34	5.48	4.38	5.40	0.00	4.45
time (sec)	N/A	0.045	0.007	0.160	1.136	0.415	0.597	0.000	4.573

Problem 326	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	C	B	B	B	B	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	113	31	31	797	740	583	745	0	583
normalized size	1	0.27	0.27	7.05	6.55	5.16	6.59	0.00	5.16
time (sec)	N/A	0.046	0.007	0.214	1.189	0.442	0.832	0.000	4.987

Problem 327	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	49	1173	0	561	0	0	265
normalized size	1	1.00	1.00	23.94	0.00	11.45	0.00	0.00	5.41
time (sec)	N/A	0.048	0.029	0.180	0.000	0.431	0.000	0.000	4.345

Problem 328	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	49	826	0	413	0	0	232
normalized size	1	1.00	1.00	16.86	0.00	8.43	0.00	0.00	4.73
time (sec)	N/A	0.049	0.027	0.116	0.000	0.414	0.000	0.000	4.171

Problem 329	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	170	170	113	543	0	293	0	0	199
normalized size	1	1.00	0.66	3.19	0.00	1.72	0.00	0.00	1.17
time (sec)	N/A	0.234	0.130	0.095	0.000	0.408	0.000	0.000	4.408

Problem 330	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	136	136	97	324	0	201	0	0	166
normalized size	1	1.00	0.71	2.38	0.00	1.48	0.00	0.00	1.22
time (sec)	N/A	0.168	0.100	0.083	0.000	0.410	0.000	0.000	4.014

Problem 331	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	102	102	79	169	0	130	0	0	97
normalized size	1	1.00	0.77	1.66	0.00	1.27	0.00	0.00	0.95
time (sec)	N/A	0.116	0.079	0.070	0.000	0.417	0.000	0.000	4.003

Problem 332	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	67	67	63	74	0	91	0	0	62
normalized size	1	1.00	0.94	1.10	0.00	1.36	0.00	0.00	0.93
time (sec)	N/A	0.064	0.035	0.061	0.000	0.410	0.000	0.000	4.769

Problem 333	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	46	35	0	45	0	0	35
normalized size	1	1.00	1.00	0.76	0.00	0.98	0.00	0.00	0.76
time (sec)	N/A	0.054	0.009	0.064	0.000	0.412	0.000	0.000	3.504

Problem 334	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	81	81	81	76	0	117	0	0	76
normalized size	1	1.00	1.00	0.94	0.00	1.44	0.00	0.00	0.94
time (sec)	N/A	0.102	0.049	0.085	0.000	0.429	0.000	0.000	3.984

Problem 335	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	115	115	95	109	0	199	0	0	105
normalized size	1	1.00	0.83	0.95	0.00	1.73	0.00	0.00	0.91
time (sec)	N/A	0.151	0.096	0.117	0.000	0.433	0.000	0.000	3.899

Problem 336	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	149	149	111	142	0	305	0	0	142
normalized size	1	1.00	0.74	0.95	0.00	2.05	0.00	0.00	0.95
time (sec)	N/A	0.208	0.131	0.153	0.000	0.431	0.000	0.000	4.373

Problem 337	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	183	183	127	175	0	439	0	0	160
normalized size	1	1.00	0.69	0.96	0.00	2.40	0.00	0.00	0.87
time (sec)	N/A	0.265	0.159	0.198	0.000	0.445	0.000	0.000	4.623

Problem 338	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	49	208	0	601	0	0	189
normalized size	1	1.00	1.00	4.24	0.00	12.27	0.00	0.00	3.86
time (sec)	N/A	0.045	0.039	0.272	0.000	0.485	0.000	0.000	4.918

Problem 339	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	49	241	0	791	0	0	217
normalized size	1	1.00	1.00	4.92	0.00	16.14	0.00	0.00	4.43
time (sec)	N/A	0.045	0.026	0.360	0.000	0.500	0.000	0.000	5.078

Problem 340	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	61	61	61	0	0	0	0	0	73
normalized size	1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	1.20
time (sec)	N/A	0.045	0.040	0.121	0.000	0.417	0.000	0.000	3.724

Problem 341	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	31	0	0	686	0	0	136
normalized size	1	1.00	1.00	0.00	0.00	22.13	0.00	0.00	4.39
time (sec)	N/A	0.046	0.010	0.189	0.000	0.453	0.000	0.000	4.017

Problem 342	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	31	0	0	487	0	0	120
normalized size	1	1.00	1.00	0.00	0.00	15.71	0.00	0.00	3.87
time (sec)	N/A	0.046	0.010	0.159	0.000	0.445	0.000	0.000	3.829

Problem 343	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	121	121	96	0	0	330	0	0	92
normalized size	1	1.00	0.79	0.00	0.00	2.73	0.00	0.00	0.76
time (sec)	N/A	0.191	0.210	0.139	0.000	0.434	0.000	0.000	3.873

Problem 344	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	87	87	71	0	0	213	0	0	76
normalized size	1	1.00	0.82	0.00	0.00	2.45	0.00	0.00	0.87
time (sec)	N/A	0.139	0.062	0.122	0.000	0.428	0.000	0.000	3.594

Problem 345	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	53	53	47	0	0	141	0	0	51
normalized size	1	1.00	0.89	0.00	0.00	2.66	0.00	0.00	0.96
time (sec)	N/A	0.091	0.045	0.109	0.000	0.421	0.000	0.000	3.724

Problem 346	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	22	0	0	42	0	0	20
normalized size	1	1.00	1.00	0.00	0.00	1.91	0.00	0.00	0.91
time (sec)	N/A	0.044	0.007	0.099	0.000	0.426	0.000	0.000	3.721

Problem 347	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	27	26	25	77	66	77	48
normalized size	1	1.00	1.00	0.96	0.93	2.85	2.44	2.85	1.78
time (sec)	N/A	0.043	0.012	0.004	0.612	0.423	0.398	0.475	3.636

Problem 348	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	B	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	62	62	47	261	144	148	114	0	136
normalized size	1	1.00	0.76	4.21	2.32	2.39	1.84	0.00	2.19
time (sec)	N/A	0.087	0.030	0.087	0.653	0.415	0.360	0.000	3.887

Problem 349	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	B	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	96	96	64	434	300	265	270	0	263
normalized size	1	1.00	0.67	4.52	3.12	2.76	2.81	0.00	2.74
time (sec)	N/A	0.135	0.045	0.140	0.888	0.408	0.490	0.000	4.083

Problem 350	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	B	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	123	123	73	641	507	423	484	0	422
normalized size	1	1.00	0.59	5.21	4.12	3.44	3.93	0.00	3.43
time (sec)	N/A	0.186	0.049	0.209	0.740	0.507	0.652	0.000	4.585

Problem 351	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	C	B	B	B	B	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	96	31	31	889	770	621	760	0	620
normalized size	1	0.32	0.32	9.26	8.02	6.47	7.92	0.00	6.46
time (sec)	N/A	0.044	0.009	0.314	1.157	0.561	1.086	0.000	5.155

Problem 352	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	C	B	B	B	B	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	113	31	31	733	1085	863	1096	0	854
normalized size	1	0.27	0.27	6.49	9.60	7.64	9.70	0.00	7.56
time (sec)	N/A	0.045	0.009	0.042	1.336	0.580	3.443	0.000	5.772

Problem 353	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	49	0	0	178	0	0	128
normalized size	1	1.00	1.00	0.00	0.00	3.63	0.00	0.00	2.61
time (sec)	N/A	0.048	0.033	0.111	0.000	0.524	0.000	0.000	3.924

Problem 354	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	49	0	0	142	0	0	107
normalized size	1	1.00	1.00	0.00	0.00	2.90	0.00	0.00	2.18
time (sec)	N/A	0.027	0.030	0.093	0.000	0.472	0.000	0.000	4.993

Problem 355	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	47	0	0	129	0	0	71
normalized size	1	1.00	1.00	0.00	0.00	2.74	0.00	0.00	1.51
time (sec)	N/A	0.007	0.013	0.061	0.000	0.434	0.000	0.000	3.935

Problem 356	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	49	0	0	59	0	0	58
normalized size	1	1.00	1.00	0.00	0.00	1.20	0.00	0.00	1.18
time (sec)	N/A	0.046	0.031	0.103	0.000	0.456	0.000	0.000	3.554

Problem 357	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	49	0	0	58	0	0	48
normalized size	1	1.00	1.00	0.00	0.00	1.18	0.00	0.00	0.98
time (sec)	N/A	0.044	0.029	0.097	0.000	0.445	0.000	0.000	3.778

Problem 358	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	49	0	0	155	0	0	114
normalized size	1	1.00	1.00	0.00	0.00	3.16	0.00	0.00	2.33
time (sec)	N/A	0.044	0.037	0.113	0.000	0.437	0.000	0.000	4.134

Problem 359	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	61	61	61	0	0	0	0	0	93
normalized size	1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	1.52
time (sec)	N/A	0.034	0.022	0.098	0.000	0.414	0.000	0.000	3.984

Problem 360	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	54	54	54	0	0	0	0	0	73
normalized size	1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	1.35
time (sec)	N/A	0.036	0.016	0.090	0.000	0.409	0.000	0.000	3.857

Problem 361	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	54	54	54	0	0	0	0	0	73
normalized size	1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	1.35
time (sec)	N/A	0.036	0.016	0.095	0.000	0.406	0.000	0.000	3.897

Problem 362	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	54	54	54	0	0	0	0	0	-1
normalized size	1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.021	0.013	0.077	0.000	0.417	0.000	0.000	0.000

Problem 363	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	50	50	50	0	0	0	0	0	-1
normalized size	1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.007	0.009	0.045	0.000	0.417	0.000	0.000	0.000

Problem 364	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	22	26	0	22	0	0	-1
normalized size	1	1.00	1.00	1.18	0.00	1.00	0.00	0.00	-0.05
time (sec)	N/A	0.035	0.005	0.345	0.000	0.425	0.000	0.000	0.000

Problem 365	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	52	52	52	0	0	0	0	0	71
normalized size	1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	1.37
time (sec)	N/A	0.035	0.013	0.100	0.000	0.416	0.000	0.000	3.703

Problem 366	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	54	54	54	0	0	0	0	0	67
normalized size	1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	1.24
time (sec)	N/A	0.035	0.011	0.098	0.000	0.408	0.000	0.000	3.716

Problem 367	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	54	54	54	0	0	0	0	0	71
normalized size	1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	1.31
time (sec)	N/A	0.037	0.010	0.099	0.000	0.408	0.000	0.000	3.619

Problem 368	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	C	A	A	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	114	32	32	113	129	116	0	0	-1
normalized size	1	0.28	0.28	0.99	1.13	1.02	0.00	0.00	-0.01
time (sec)	N/A	0.038	0.007	0.024	1.046	0.433	0.000	0.000	0.000

Problem 369	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	C	A	A	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	94	31	31	95	108	98	0	0	-1
normalized size	1	0.33	0.33	1.01	1.15	1.04	0.00	0.00	-0.01
time (sec)	N/A	0.040	0.007	0.026	1.019	0.411	0.000	0.000	0.000

Problem 370	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	137	137	32	77	87	80	0	0	-1
normalized size	1	1.00	0.23	0.56	0.64	0.58	0.00	0.00	-0.01
time (sec)	N/A	0.168	0.007	0.024	1.023	0.421	0.000	0.000	0.000

Problem 371	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	100	100	31	59	66	62	0	0	-1
normalized size	1	1.00	0.31	0.59	0.66	0.62	0.00	0.00	-0.01
time (sec)	N/A	0.120	0.007	0.023	1.022	0.433	0.000	0.000	0.000

Problem 372	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	63	63	32	74	45	44	0	0	-1
normalized size	1	1.00	0.51	1.17	0.71	0.70	0.00	0.00	-0.02
time (sec)	N/A	0.074	0.007	0.074	1.007	0.452	0.000	0.000	0.000

Problem 373	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	27	32	27	31	0	27	27
normalized size	1	1.00	1.00	1.19	1.00	1.15	0.00	1.00	1.00
time (sec)	N/A	0.037	0.008	0.053	0.903	0.429	0.000	0.301	3.680

Problem 374	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	22	26	0	22	0	0	-1
normalized size	1	1.00	1.00	1.18	0.00	1.00	0.00	0.00	-0.05
time (sec)	N/A	0.036	0.002	0.048	0.000	0.435	0.000	0.000	0.000

Problem 375	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	56	27	61	0	62	0	0	-1
normalized size	1	1.00	0.48	1.09	0.00	1.11	0.00	0.00	-0.02
time (sec)	N/A	0.073	0.007	0.148	0.000	0.417	0.000	0.000	0.000

Problem 376	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	100	100	32	99	0	84	0	0	-1
normalized size	1	1.00	0.32	0.99	0.00	0.84	0.00	0.00	-0.01
time (sec)	N/A	0.114	0.007	0.171	0.000	0.431	0.000	0.000	0.000

Problem 377	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	139	139	31	137	0	101	0	0	-1
normalized size	1	1.00	0.22	0.99	0.00	0.73	0.00	0.00	-0.01
time (sec)	N/A	0.164	0.007	0.118	0.000	0.411	0.000	0.000	0.000

Problem 378	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	B	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	32	175	0	119	0	0	-1
normalized size	1	1.00	1.00	5.47	0.00	3.72	0.00	0.00	-0.03
time (sec)	N/A	0.043	0.007	0.121	0.000	0.418	0.000	0.000	0.000

Problem 379	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	B	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	31	213	0	137	0	0	-1
normalized size	1	1.00	1.00	6.87	0.00	4.42	0.00	0.00	-0.03
time (sec)	N/A	0.039	0.007	0.123	0.000	0.416	0.000	0.000	0.000

Problem 380	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	47	36	0	50	0	37	39
normalized size	1	1.00	1.00	0.77	0.00	1.06	0.00	0.79	0.83
time (sec)	N/A	0.065	0.012	0.166	0.000	0.433	0.000	0.467	3.947

Problem 381	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	47	34	0	47	0	35	35
normalized size	1	1.00	1.00	0.72	0.00	1.00	0.00	0.74	0.74
time (sec)	N/A	0.048	0.008	0.155	0.000	0.475	0.000	0.461	4.044

Problem 382	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	518	518	412	1657	1456	531	0	942	716
normalized size	1	1.00	0.80	3.20	2.81	1.03	0.00	1.82	1.38
time (sec)	N/A	0.943	0.624	0.117	5.377	0.474	0.000	0.503	4.112

Problem 383	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	389	389	220	1063	1052	364	0	644	517
normalized size	1	1.00	0.57	2.73	2.70	0.94	0.00	1.66	1.33
time (sec)	N/A	0.654	0.451	0.100	4.308	0.438	0.000	0.629	3.682

Problem 384	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	258	258	148	617	695	208	0	426	313
normalized size	1	1.00	0.57	2.39	2.69	0.81	0.00	1.65	1.21
time (sec)	N/A	0.436	0.259	0.087	3.275	0.484	0.000	0.482	3.757

Problem 385	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	170	170	105	324	422	135	0	258	194
normalized size	1	1.00	0.62	1.91	2.48	0.79	0.00	1.52	1.14
time (sec)	N/A	0.314	0.226	0.079	2.439	0.439	0.000	0.537	3.818

Problem 386	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	81	81	74	132	195	85	0	127	96
normalized size	1	1.00	0.91	1.63	2.41	1.05	0.00	1.57	1.19
time (sec)	N/A	0.147	0.070	0.066	1.762	0.462	0.000	0.456	3.626

Problem 387	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	44	58	58	48	0	36	48
normalized size	1	1.00	1.00	1.32	1.32	1.09	0.00	0.82	1.09
time (sec)	N/A	0.012	0.006	0.019	0.975	0.467	0.000	0.422	3.402

Problem 388	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.069	0.292	0.102	0.000	0.427	0.000	0.000	0.000

Problem 389	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	109	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.156	0.777	0.101	0.000	0.440	0.000	0.000	0.000

Problem 390	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	200	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.314	1.160	0.097	0.000	0.442	0.000	0.000	0.000

Problem 391	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	177	177	167	0	0	239	0	0	-1
normalized size	1	1.00	0.94	0.00	0.00	1.35	0.00	0.00	-0.01
time (sec)	N/A	0.156	0.202	0.095	0.000	0.447	0.000	0.000	0.000

Problem 392	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	126	126	117	0	0	175	0	0	-1
normalized size	1	1.00	0.93	0.00	0.00	1.39	0.00	0.00	-0.01
time (sec)	N/A	0.107	0.085	0.095	0.000	0.441	0.000	0.000	0.000

Problem 393	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	92	92	86	0	0	110	0	0	-1
normalized size	1	1.00	0.93	0.00	0.00	1.20	0.00	0.00	-0.01
time (sec)	N/A	0.060	0.063	0.052	0.000	0.427	0.000	0.000	0.000

Problem 394	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	40	0	0	52	0	0	-1
normalized size	1	1.00	1.00	0.00	0.00	1.30	0.00	0.00	-0.02
time (sec)	N/A	0.005	0.006	0.031	0.000	0.432	0.000	0.000	0.000

Problem 395	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	22	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.05
time (sec)	N/A	0.023	0.389	0.101	0.000	0.441	0.000	0.000	0.000

Problem 396	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	153	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.350	2.062	0.102	0.000	0.411	0.000	0.000	0.000

Problem 397	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	71	71	66	106	0	89	0	0	-1
normalized size	1	1.00	0.93	1.49	0.00	1.25	0.00	0.00	-0.01
time (sec)	N/A	0.405	0.132	0.196	0.000	0.430	0.000	0.000	0.000

Problem 398	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	116	116	116	191	0	179	0	0	-1
normalized size	1	1.00	1.00	1.65	0.00	1.54	0.00	0.00	-0.01
time (sec)	N/A	1.011	0.328	0.168	0.000	0.444	0.000	0.000	0.000

Problem 399	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	A	F	B	F(-1)	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	267	267	0	506	0	555	0	0	-1
normalized size	1	1.00	0.00	1.90	0.00	2.08	0.00	0.00	-0.00
time (sec)	N/A	1.914	0.824	0.189	0.000	0.470	0.000	0.000	0.000

Problem 400	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	B	F	B	F(-1)	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	460	460	0	922	0	1376	0	0	-1
normalized size	1	1.00	0.00	2.00	0.00	2.99	0.00	0.00	-0.00
time (sec)	N/A	3.751	0.628	0.225	0.000	0.489	0.000	0.000	0.000

Problem 401	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	B	F	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	346	346	468	1146	0	638	0	1427	-1
normalized size	1	1.00	1.35	3.31	0.00	1.84	0.00	4.12	-0.00
time (sec)	N/A	0.362	0.501	0.023	0.000	0.449	0.000	0.754	0.000

Problem 402	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	B	F	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	320	320	292	682	0	377	0	830	-1
normalized size	1	1.00	0.91	2.13	0.00	1.18	0.00	2.59	-0.00
time (sec)	N/A	0.317	0.332	0.021	0.000	0.425	0.000	0.621	0.000

Problem 403	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	255	255	170	356	0	197	0	424	306
normalized size	1	1.00	0.67	1.40	0.00	0.77	0.00	1.66	1.20
time (sec)	N/A	0.256	0.212	0.018	0.000	0.417	0.000	0.550	4.101

Problem 404	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	125	125	91	150	0	83	0	171	153
normalized size	1	1.00	0.73	1.20	0.00	0.66	0.00	1.37	1.22
time (sec)	N/A	0.128	0.097	0.015	0.000	0.405	0.000	0.438	3.665

Problem 405	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	37	37	37	42	0	35	0	49	44
normalized size	1	1.00	1.00	1.14	0.00	0.95	0.00	1.32	1.19
time (sec)	N/A	0.030	0.013	0.012	0.000	0.405	0.000	0.312	3.622

Problem 406	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	62	62	56	79	0	71	0	492	-1
normalized size	1	1.00	0.90	1.27	0.00	1.15	0.00	7.94	-0.02
time (sec)	N/A	0.203	0.066	0.023	0.000	0.416	0.000	1.950	0.000

Problem 407	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	107	107	105	97	0	154	0	345	-1
normalized size	1	1.00	0.98	0.91	0.00	1.44	0.00	3.22	-0.01
time (sec)	N/A	0.545	0.171	0.020	0.000	0.425	0.000	0.338	0.000

Problem 408	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	A	F	B	F	B	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	240	240	0	240	0	517	0	1759	-1
normalized size	1	1.00	0.00	1.00	0.00	2.15	0.00	7.33	-0.00
time (sec)	N/A	1.037	0.476	0.022	0.000	0.417	0.000	0.532	0.000

Problem 409	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	322	322	243	560	0	311	0	0	-1
normalized size	1	1.00	0.75	1.74	0.00	0.97	0.00	0.00	-0.00
time (sec)	N/A	0.339	0.337	0.030	0.000	0.422	0.000	0.000	0.000

Problem 410	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	215	215	176	313	0	196	0	0	-1
normalized size	1	1.00	0.82	1.46	0.00	0.91	0.00	0.00	-0.00
time (sec)	N/A	0.233	0.213	0.025	0.000	0.426	0.000	0.000	0.000

Problem 411	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	111	111	85	140	0	122	0	0	-1
normalized size	1	1.00	0.77	1.26	0.00	1.10	0.00	0.00	-0.01
time (sec)	N/A	0.129	0.127	0.021	0.000	0.416	0.000	0.000	0.000

Problem 412	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	50	50	50	48	0	63	0	0	43
normalized size	1	1.00	1.00	0.96	0.00	1.26	0.00	0.00	0.86
time (sec)	N/A	0.040	0.023	0.018	0.000	0.406	0.000	0.000	3.691

Problem 413	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	22	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.05
time (sec)	N/A	0.023	0.044	0.119	0.000	0.425	0.000	0.000	0.000

Problem 414	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	22	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.05
time (sec)	N/A	0.058	0.330	0.142	0.000	0.440	0.000	0.000	0.000

Problem 415	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	22	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.05
time (sec)	N/A	0.053	0.088	0.197	0.000	0.435	0.000	0.000	0.000

Problem 416	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	206	206	195	0	0	349	0	0	-1
normalized size	1	1.00	0.95	0.00	0.00	1.69	0.00	0.00	-0.00
time (sec)	N/A	0.189	0.194	0.130	0.000	0.488	0.000	0.000	0.000

Problem 417	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	151	151	136	0	0	259	0	0	-1
normalized size	1	1.00	0.90	0.00	0.00	1.72	0.00	0.00	-0.01
time (sec)	N/A	0.133	0.080	0.113	0.000	0.459	0.000	0.000	0.000

Problem 418	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	92	92	85	0	0	169	0	0	-1
normalized size	1	1.00	0.92	0.00	0.00	1.84	0.00	0.00	-0.01
time (sec)	N/A	0.057	0.091	0.102	0.000	0.452	0.000	0.000	0.000

Problem 419	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	40	0	0	89	0	0	61
normalized size	1	1.00	1.00	0.00	0.00	2.22	0.00	0.00	1.52
time (sec)	N/A	0.006	0.006	0.050	0.000	0.430	0.000	0.000	3.951

Problem 420	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	22	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.05
time (sec)	N/A	0.022	0.034	0.113	0.000	0.426	0.000	0.000	0.000

Problem 421	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	22	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.05
time (sec)	N/A	0.057	0.359	0.118	0.000	0.436	0.000	0.000	0.000

Problem 422	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	104	104	103	432	0	135	0	0	-1
normalized size	1	1.00	0.99	4.15	0.00	1.30	0.00	0.00	-0.01
time (sec)	N/A	1.046	0.319	0.264	0.000	0.427	0.000	0.000	0.000

Problem 423	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	B	F	A	F(-1)	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	159	159	0	580	0	220	0	0	-1
normalized size	1	1.00	0.00	3.65	0.00	1.38	0.00	0.00	-0.01
time (sec)	N/A	2.559	1.189	0.207	0.000	0.540	0.000	0.000	0.000

Problem 424	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	B	F	B	F(-1)	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	366	366	0	2014	0	755	0	0	-1
normalized size	1	1.00	0.00	5.50	0.00	2.06	0.00	0.00	-0.00
time (sec)	N/A	4.757	0.522	0.246	0.000	0.481	0.000	0.000	0.000

Problem 425	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	B	F	B	F(-1)	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	634	634	0	4671	0	2250	0	0	-1
normalized size	1	1.00	0.00	7.37	0.00	3.55	0.00	0.00	-0.00
time (sec)	N/A	9.405	0.987	0.299	0.000	0.512	0.000	0.000	0.000

Problem 426	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	217	217	122	218	201	114	0	137	153
normalized size	1	1.00	0.56	1.00	0.93	0.53	0.00	0.63	0.71
time (sec)	N/A	0.231	0.180	0.113	2.279	0.414	0.000	0.392	3.870

Problem 427	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	164	164	104	163	166	95	0	108	111
normalized size	1	1.00	0.63	0.99	1.01	0.58	0.00	0.66	0.68
time (sec)	N/A	0.093	0.125	0.060	2.079	0.415	0.000	0.422	3.599

Problem 428	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	81	81	81	79	107	73	0	80	71
normalized size	1	1.00	1.00	0.98	1.32	0.90	0.00	0.99	0.88
time (sec)	N/A	0.038	0.069	0.053	2.026	0.407	0.000	0.440	3.571

Problem 429	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	56	56	50	50	55	0	50	49
normalized size	1	1.00	1.00	0.89	0.89	0.98	0.00	0.89	0.88
time (sec)	N/A	0.015	0.014	0.049	1.062	0.408	0.000	0.390	3.529

Problem 430	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	19	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.05
time (sec)	N/A	0.025	0.117	0.033	0.000	0.416	0.000	0.000	0.000

Problem 431	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	94	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.076	0.273	0.042	0.000	0.401	0.000	0.000	0.000

Problem 432	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	181	181	91	194	181	89	0	104	112
normalized size	1	1.00	0.50	1.07	1.00	0.49	0.00	0.57	0.62
time (sec)	N/A	0.179	0.226	0.018	2.201	0.393	0.000	0.415	0.301

Problem 433	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	134	134	79	111	151	72	0	80	80
normalized size	1	1.00	0.59	0.83	1.13	0.54	0.00	0.60	0.60
time (sec)	N/A	0.082	0.118	0.016	2.129	0.392	0.000	0.292	3.717

Problem 434	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	66	66	68	53	98	57	0	58	58
normalized size	1	1.00	1.03	0.80	1.48	0.86	0.00	0.88	0.88
time (sec)	N/A	0.032	0.049	0.016	1.494	0.393	0.000	0.304	3.475

Problem 435	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	46	34	32	36	41	38	40
normalized size	1	1.00	1.05	0.77	0.73	0.82	0.93	0.86	0.91
time (sec)	N/A	0.011	0.013	0.014	0.815	0.388	0.705	0.386	0.032

Problem 436	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	20	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.05
time (sec)	N/A	0.028	0.126	0.028	0.000	0.405	0.000	0.000	0.000

Problem 437	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	82	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.071	0.227	0.031	0.000	0.396	0.000	0.000	0.000

Problem 438	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	297	297	191	368	267	212	0	250	230
normalized size	1	1.00	0.64	1.24	0.90	0.71	0.00	0.84	0.77
time (sec)	N/A	0.636	0.358	0.025	2.107	0.401	0.000	0.297	3.692

Problem 439	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	216	216	144	212	221	148	0	152	150
normalized size	1	1.00	0.67	0.98	1.02	0.69	0.00	0.70	0.69
time (sec)	N/A	0.271	0.184	0.019	1.899	0.413	0.000	0.443	0.301

Problem 440	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	107	107	116	102	143	107	0	104	95
normalized size	1	1.00	1.08	0.95	1.34	1.00	0.00	0.97	0.89
time (sec)	N/A	0.104	0.094	0.015	1.377	0.407	0.000	0.425	3.669

Problem 441	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	68	60	58	74	0	68	60
normalized size	1	1.00	1.00	0.88	0.85	1.09	0.00	1.00	0.88
time (sec)	N/A	0.025	0.017	0.014	0.851	0.399	0.000	0.327	0.035

Problem 442	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	28	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.139	0.558	0.032	0.000	0.385	0.000	0.000	0.000

Problem 443	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	128	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.265	0.380	0.034	0.000	0.392	0.000	0.000	0.000

Problem 444	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	266	266	169	550	539	204	0	401	251
normalized size	1	1.00	0.64	2.07	2.03	0.77	0.00	1.51	0.94
time (sec)	N/A	0.324	0.290	0.082	2.706	0.422	0.000	0.540	3.888

Problem 445	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	189	189	123	307	332	130	0	252	153
normalized size	1	1.00	0.65	1.62	1.76	0.69	0.00	1.33	0.81
time (sec)	N/A	0.108	0.188	0.072	2.068	0.415	0.000	0.402	3.850

Problem 446	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	90	90	96	131	160	83	0	136	80
normalized size	1	1.00	1.07	1.46	1.78	0.92	0.00	1.51	0.89
time (sec)	N/A	0.041	0.105	0.061	1.417	0.417	0.000	0.468	3.705

Problem 447	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	23	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.031	0.218	0.104	0.000	0.435	0.000	0.000	0.000

Problem 448	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	120	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.103	0.594	0.102	0.000	0.442	0.000	0.000	0.000

Problem 449	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	207	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.208	0.852	0.101	0.000	0.434	0.000	0.000	0.000

Problem 450	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	C	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	45	45	31	45	539	41	85	780	44
normalized size	1	1.00	0.69	1.00	11.98	0.91	1.89	17.33	0.98
time (sec)	N/A	0.056	0.127	0.008	2.352	0.440	0.167	0.570	3.810

Problem 451	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	78	78	86	99	332	74	0	88	92
normalized size	1	1.00	1.10	1.27	4.26	0.95	0.00	1.13	1.18
time (sec)	N/A	0.056	0.111	0.070	2.059	0.429	0.000	0.450	3.793

Problem 452	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	18	17	17	24	17	17
normalized size	1	1.00	1.00	1.06	1.00	1.00	1.41	1.00	1.00
time (sec)	N/A	0.017	0.040	0.005	0.778	0.412	0.123	0.379	3.624

Problem 453	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	39	39	40	0	47	0	0	-1
normalized size	1	1.00	1.00	1.03	0.00	1.21	0.00	0.00	-0.03
time (sec)	N/A	0.037	0.054	0.042	0.000	0.422	0.000	0.000	0.000

Problem 454	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	84	84	96	101	0	85	0	0	76
normalized size	1	1.00	1.14	1.20	0.00	1.01	0.00	0.00	0.90
time (sec)	N/A	0.055	0.107	0.093	0.000	0.440	0.000	0.000	4.142

Problem 455	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	69	69	79	88	0	106	0	0	-1
normalized size	1	1.00	1.14	1.28	0.00	1.54	0.00	0.00	-0.01
time (sec)	N/A	0.071	0.094	0.053	0.000	0.413	0.000	0.000	0.000

Problem 456	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	C	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	29	44	536	40	83	726	43
normalized size	1	1.00	0.67	1.02	12.47	0.93	1.93	16.88	1.00
time (sec)	N/A	0.043	0.097	0.007	2.166	0.412	0.166	0.528	3.688

Problem 457	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	75	75	84	90	329	68	0	77	86
normalized size	1	1.00	1.12	1.20	4.39	0.91	0.00	1.03	1.15
time (sec)	N/A	0.058	0.068	0.069	1.040	0.420	0.000	0.456	3.647

Problem 458	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	17	16	16	22	16	16
normalized size	1	1.00	1.00	1.06	1.00	1.00	1.38	1.00	1.00
time (sec)	N/A	0.014	0.027	0.006	0.847	0.416	0.121	0.301	3.516

Problem 459	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	37	37	37	33	0	42	0	0	-1
normalized size	1	1.00	1.00	0.89	0.00	1.14	0.00	0.00	-0.03
time (sec)	N/A	0.029	0.040	0.039	0.000	0.406	0.000	0.000	0.000

Problem 460	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	81	81	94	87	0	79	0	0	73
normalized size	1	1.00	1.16	1.07	0.00	0.98	0.00	0.00	0.90
time (sec)	N/A	0.049	0.058	0.062	0.000	0.417	0.000	0.000	3.781

Problem 461	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	66	66	77	74	0	100	0	0	-1
normalized size	1	1.00	1.17	1.12	0.00	1.52	0.00	0.00	-0.02
time (sec)	N/A	0.063	0.069	0.051	0.000	0.408	0.000	0.000	0.000

Problem 462	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	145	145	133	142	0	128	0	0	-1
normalized size	1	1.00	0.92	0.98	0.00	0.88	0.00	0.00	-0.01
time (sec)	N/A	0.352	0.290	0.035	0.000	0.428	0.000	0.000	0.000

Problem 463	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	111	111	93	112	0	80	0	0	-1
normalized size	1	1.00	0.84	1.01	0.00	0.72	0.00	0.00	-0.01
time (sec)	N/A	0.247	0.126	0.029	0.000	0.418	0.000	0.000	0.000

Problem 464	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	118	118	94	102	0	98	0	0	-1
normalized size	1	1.00	0.80	0.86	0.00	0.83	0.00	0.00	-0.01
time (sec)	N/A	0.119	0.057	0.020	0.000	0.389	0.000	0.000	0.000

Problem 465	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	100	100	83	323	0	72	0	0	-1
normalized size	1	1.00	0.83	3.23	0.00	0.72	0.00	0.00	-0.01
time (sec)	N/A	0.129	0.062	0.027	0.000	0.402	0.000	0.000	0.000

Problem 466	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	132	132	120	660	0	106	0	0	-1
normalized size	1	1.00	0.91	5.00	0.00	0.80	0.00	0.00	-0.01
time (sec)	N/A	0.235	0.131	0.036	0.000	0.411	0.000	0.000	0.000

Problem 467	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	212	212	232	561	0	313	0	0	-1
normalized size	1	1.00	1.09	2.65	0.00	1.48	0.00	0.00	-0.00
time (sec)	N/A	0.620	1.141	0.033	0.000	0.410	0.000	0.000	0.000

Problem 468	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	169	169	163	369	0	241	0	0	-1
normalized size	1	1.00	0.96	2.18	0.00	1.43	0.00	0.00	-0.01
time (sec)	N/A	0.411	0.573	0.028	0.000	0.409	0.000	0.000	0.000

Problem 469	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	138	138	127	169	0	192	0	0	-1
normalized size	1	1.00	0.92	1.22	0.00	1.39	0.00	0.00	-0.01
time (sec)	N/A	0.194	0.146	0.021	0.000	0.426	0.000	0.000	0.000

Problem 470	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	158	158	153	685	0	224	0	0	-1
normalized size	1	1.00	0.97	4.34	0.00	1.42	0.00	0.00	-0.01
time (sec)	N/A	0.214	0.189	0.025	0.000	0.417	0.000	0.000	0.000

Problem 471	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	186	186	217	1730	0	267	0	0	-1
normalized size	1	1.00	1.17	9.30	0.00	1.44	0.00	0.00	-0.01
time (sec)	N/A	0.408	0.532	0.036	0.000	0.406	0.000	0.000	0.000

Problem 472	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	232	232	268	3532	0	330	0	0	-1
normalized size	1	1.00	1.16	15.22	0.00	1.42	0.00	0.00	-0.00
time (sec)	N/A	0.510	0.653	0.051	0.000	0.427	0.000	0.000	0.000

Problem 473	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	27	35	30	25	41	0	26
normalized size	1	1.00	0.90	1.17	1.00	0.83	1.37	0.00	0.87
time (sec)	N/A	0.037	0.020	0.028	1.858	0.413	0.294	0.000	3.596

Problem 474	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	27	35	30	25	31	31	26
normalized size	1	1.00	0.90	1.17	1.00	0.83	1.03	1.03	0.87
time (sec)	N/A	0.034	0.012	0.023	0.864	0.429	0.156	0.303	3.606

Problem 475	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	26	37	33	27	44	0	27
normalized size	1	1.00	0.81	1.16	1.03	0.84	1.38	0.00	0.84
time (sec)	N/A	0.038	0.023	0.029	1.655	0.428	0.303	0.000	3.614

Problem 476	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	26	37	33	27	34	34	27
normalized size	1	1.00	0.81	1.16	1.03	0.84	1.06	1.06	0.84
time (sec)	N/A	0.035	0.014	0.025	0.780	0.420	0.167	0.399	3.578

Problem 477	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	58	58	36	54	59	39	92	0	-1
normalized size	1	1.00	0.62	0.93	1.02	0.67	1.59	0.00	-0.02
time (sec)	N/A	0.058	0.034	0.030	2.100	0.417	0.365	0.000	0.000

Problem 478	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	58	58	36	54	59	39	92	48	47
normalized size	1	1.00	0.62	0.93	1.02	0.67	1.59	0.83	0.81
time (sec)	N/A	0.051	0.019	0.026	0.788	0.414	0.222	0.391	3.681

Problem 479	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	58	58	38	55	58	41	92	0	-1
normalized size	1	1.00	0.66	0.95	1.00	0.71	1.59	0.00	-0.02
time (sec)	N/A	0.054	0.031	0.025	1.943	0.408	0.367	0.000	0.000

Problem 480	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	58	58	38	55	58	41	92	50	47
normalized size	1	1.00	0.66	0.95	1.00	0.71	1.59	0.86	0.81
time (sec)	N/A	0.052	0.018	0.026	0.849	0.417	0.227	0.384	3.652

Problem 481	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	30	53	21	86	29	0	22
normalized size	1	1.00	1.00	1.77	0.70	2.87	0.97	0.00	0.73
time (sec)	N/A	0.030	0.008	0.050	1.519	0.446	0.315	0.000	3.544

Problem 482	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	30	53	21	86	24	21	22
normalized size	1	1.00	1.00	1.77	0.70	2.87	0.80	0.70	0.73
time (sec)	N/A	0.029	0.004	0.047	2.074	0.411	0.183	0.331	3.583

Problem 483	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	30	49	45	86	29	0	22
normalized size	1	1.00	1.00	1.63	1.50	2.87	0.97	0.00	0.73
time (sec)	N/A	0.028	0.007	0.048	2.053	0.428	0.327	0.000	3.784

Problem 484	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	30	49	45	86	24	24	22
normalized size	1	1.00	1.00	1.63	1.50	2.87	0.80	0.80	0.73
time (sec)	N/A	0.030	0.005	0.048	1.870	0.429	0.194	0.361	3.587

Problem 485	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	40	74	68	102	54	0	35
normalized size	1	1.00	0.93	1.72	1.58	2.37	1.26	0.00	0.81
time (sec)	N/A	0.043	0.021	0.052	1.985	0.422	0.383	0.000	3.606

Problem 486	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	40	74	39	102	44	38	35
normalized size	1	1.00	0.93	1.72	0.91	2.37	1.02	0.88	0.81
time (sec)	N/A	0.040	0.009	0.052	1.872	0.463	0.237	0.390	3.539

Problem 487	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	40	70	88	103	54	0	35
normalized size	1	1.00	0.93	1.63	2.05	2.40	1.26	0.00	0.81
time (sec)	N/A	0.043	0.019	0.054	2.162	0.429	0.393	0.000	3.676

Problem 488	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	40	70	65	103	44	39	35
normalized size	1	1.00	0.93	1.63	1.51	2.40	1.02	0.91	0.81
time (sec)	N/A	0.043	0.009	0.050	2.019	0.442	0.247	0.263	3.619

Problem 489	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F(-2)	F	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	33	0	0	77	85	0	28
normalized size	1	1.00	1.06	0.00	0.00	2.48	2.74	0.00	0.90
time (sec)	N/A	0.039	0.012	180.000	0.000	0.433	0.816	0.000	3.678

Problem 490	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F(-2)	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	33	0	22	77	85	31	28
normalized size	1	1.00	1.06	0.00	0.71	2.48	2.74	1.00	0.90
time (sec)	N/A	0.038	0.005	180.000	0.778	0.440	0.922	0.631	3.713

Problem 491	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F(-2)	F	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	34	0	0	92	82	0	33
normalized size	1	1.00	1.06	0.00	0.00	2.88	2.56	0.00	1.03
time (sec)	N/A	0.040	0.014	180.000	0.000	0.442	0.860	0.000	3.774

Problem 492	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F(-2)	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	34	0	22	92	82	36	33
normalized size	1	1.00	1.06	0.00	0.69	2.88	2.56	1.12	1.03
time (sec)	N/A	0.040	0.005	180.000	1.884	0.463	0.973	0.608	3.634

Problem 493	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	35	40	19	30	0	0	24
normalized size	1	1.00	1.46	1.67	0.79	1.25	0.00	0.00	1.00
time (sec)	N/A	0.048	0.032	0.046	2.486	0.441	0.000	0.000	3.507

Problem 494	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	35	40	24	30	0	29	24
normalized size	1	1.00	1.46	1.67	1.00	1.25	0.00	1.21	1.00
time (sec)	N/A	0.047	0.007	0.025	0.596	0.433	0.000	0.431	3.549

Problem 495	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	25	25	38	44	21	32	0	0	25
normalized size	1	1.00	1.52	1.76	0.84	1.28	0.00	0.00	1.00
time (sec)	N/A	0.050	0.032	0.040	2.029	0.425	0.000	0.000	3.556

Problem 496	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	25	25	38	44	25	32	0	33	25
normalized size	1	1.00	1.52	1.76	1.00	1.28	0.00	1.32	1.00
time (sec)	N/A	0.050	0.007	0.023	1.159	0.419	0.000	0.410	3.512

Problem 497	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	29	29	68	27	56	0	28
normalized size	1	1.00	0.66	0.66	1.55	0.61	1.27	0.00	0.64
time (sec)	N/A	0.040	0.023	0.030	1.785	0.408	0.973	0.000	3.681

Problem 498	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	29	29	38	27	58	31	28
normalized size	1	1.00	0.66	0.66	0.86	0.61	1.32	0.70	0.64
time (sec)	N/A	0.041	0.012	0.014	0.831	0.451	0.970	0.279	3.618

Problem 499	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	30	29	71	28	58	0	28
normalized size	1	1.00	0.65	0.63	1.54	0.61	1.26	0.00	0.61
time (sec)	N/A	0.043	0.024	0.031	2.106	0.453	0.974	0.000	3.644

Problem 500	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	30	29	40	28	60	33	28
normalized size	1	1.00	0.65	0.63	0.87	0.61	1.30	0.72	0.61
time (sec)	N/A	0.044	0.013	0.014	0.972	0.476	0.977	0.445	3.536

Problem 501	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	93	93	111	0	0	166	0	0	-1
normalized size	1	1.00	1.19	0.00	0.00	1.78	0.00	0.00	-0.01
time (sec)	N/A	0.074	0.091	0.042	0.000	0.433	0.000	0.000	0.000

Problem 502	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	93	93	111	0	124	166	0	94	-1
normalized size	1	1.00	1.19	0.00	1.33	1.78	0.00	1.01	-0.01
time (sec)	N/A	0.073	0.036	0.019	2.045	0.429	0.000	0.635	0.000

Problem 503	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	96	96	115	0	0	174	0	0	-1
normalized size	1	1.00	1.20	0.00	0.00	1.81	0.00	0.00	-0.01
time (sec)	N/A	0.076	0.082	0.039	0.000	0.444	0.000	0.000	0.000

Problem 504	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	96	96	115	0	130	174	0	96	-1
normalized size	1	1.00	1.20	0.00	1.35	1.81	0.00	1.00	-0.01
time (sec)	N/A	0.077	0.013	0.020	1.957	0.436	0.000	0.469	0.000

Problem 505	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	18	15	25	14	15	15
normalized size	1	1.00	1.00	1.06	0.88	1.47	0.82	0.88	0.88
time (sec)	N/A	0.015	0.017	0.018	0.589	0.421	0.087	0.238	3.264

Problem 506	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	24	21	18	18	17	18	18
normalized size	1	1.00	1.00	0.88	0.75	0.75	0.71	0.75	0.75
time (sec)	N/A	0.020	0.011	0.020	0.836	0.420	0.117	0.375	0.075

Problem 507	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	56	44	35	43	53	22	46	32
normalized size	1	1.00	0.79	0.62	0.77	0.95	0.39	0.82	0.57
time (sec)	N/A	0.032	0.025	0.018	1.859	0.418	0.129	0.364	3.695

Problem 508	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	44	37	34	34	24	34	34
normalized size	1	1.00	1.00	0.84	0.77	0.77	0.55	0.77	0.77
time (sec)	N/A	0.036	0.019	0.018	2.023	0.440	0.126	0.289	3.518

Problem 509	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	67	67	66	66	0	219	63	63	63
normalized size	1	1.00	0.99	0.99	0.00	3.27	0.94	0.94	0.94
time (sec)	N/A	0.065	0.108	0.019	0.000	0.422	0.330	0.338	0.232

Problem 510	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	38	38	37	49	0	0	-1
normalized size	1	1.00	0.86	0.86	0.84	1.11	0.00	0.00	-0.02
time (sec)	N/A	0.128	0.062	0.022	0.777	0.412	0.000	0.000	0.000

Problem 511	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	54	54	49	41	38	38	0	0	-1
normalized size	1	1.00	0.91	0.76	0.70	0.70	0.00	0.00	-0.02
time (sec)	N/A	0.124	0.004	0.017	0.898	0.414	0.000	0.000	0.000

Problem 512	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	180	180	120	183	0	86	0	0	-1
normalized size	1	1.00	0.67	1.02	0.00	0.48	0.00	0.00	-0.01
time (sec)	N/A	0.188	0.106	0.021	0.000	0.448	0.000	0.000	0.000

Problem 513	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	204	204	144	235	0	100	0	0	-1
normalized size	1	1.00	0.71	1.15	0.00	0.49	0.00	0.00	-0.00
time (sec)	N/A	0.195	0.095	0.022	0.000	0.444	0.000	0.000	0.000

Problem 514	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	276	276	205	378	0	280	0	0	-1
normalized size	1	1.00	0.74	1.37	0.00	1.01	0.00	0.00	-0.00
time (sec)	N/A	0.429	0.223	0.024	0.000	0.430	0.000	0.000	0.000

Problem 515	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	C	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	72	72	57	65	62	76	0	0	-1
normalized size	1	1.00	0.79	0.90	0.86	1.06	0.00	0.00	-0.01
time (sec)	N/A	0.230	0.099	0.041	0.913	0.405	0.000	0.000	0.000

Problem 516	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	C	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	77	77	77	62	59	59	0	0	-1
normalized size	1	1.00	1.00	0.81	0.77	0.77	0.00	0.00	-0.01
time (sec)	N/A	0.222	0.010	0.017	0.926	0.419	0.000	0.000	0.000

Problem 517	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	C	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	259	259	172	0	0	138	0	0	-1
normalized size	1	1.00	0.66	0.00	0.00	0.53	0.00	0.00	-0.00
time (sec)	N/A	0.296	0.154	0.045	0.000	0.416	0.000	0.000	0.000

Problem 518	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	C	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	293	293	216	0	0	150	0	0	-1
normalized size	1	1.00	0.74	0.00	0.00	0.51	0.00	0.00	-0.00
time (sec)	N/A	0.309	0.192	0.043	0.000	0.447	0.000	0.000	0.000

Problem 519	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F(-2)	C	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	391	391	407	0	0	415	0	0	-1
normalized size	1	1.00	1.04	0.00	0.00	1.06	0.00	0.00	-0.00
time (sec)	N/A	0.665	0.185	0.046	0.000	0.434	0.000	0.000	0.000

Problem 520	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F(-2)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	37	68	48	59	34	0	50
normalized size	1	1.00	0.92	1.70	1.20	1.48	0.85	0.00	1.25
time (sec)	N/A	0.027	0.036	0.026	0.973	0.428	0.128	0.000	3.520

Problem 521	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F(-2)	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	94	94	93	547	0	309	104	114	96
normalized size	1	1.00	0.99	5.82	0.00	3.29	1.11	1.21	1.02
time (sec)	N/A	0.108	0.149	0.114	0.000	0.448	0.508	0.308	3.668

Problem 522	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F(-2)	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	94	94	93	546	0	309	104	114	96
normalized size	1	1.00	0.99	5.81	0.00	3.29	1.11	1.21	1.02
time (sec)	N/A	0.093	0.150	0.108	0.000	0.455	0.504	0.429	3.806

Problem 523	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	96	96	88	143	95	143	0	0	-1
normalized size	1	1.00	0.92	1.49	0.99	1.49	0.00	0.00	-0.01
time (sec)	N/A	0.268	0.180	0.075	1.041	0.419	0.000	0.000	0.000

Problem 524	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	B	F(-2)	A	F	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	338	338	0	855	0	497	0	0	-1
normalized size	1	1.00	0.00	2.53	0.00	1.47	0.00	0.00	-0.00
time (sec)	N/A	0.686	5.329	0.097	0.000	0.454	0.000	0.000	0.000

Problem 525	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	C	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	145	145	123	232	159	210	0	0	-1
normalized size	1	1.00	0.85	1.60	1.10	1.45	0.00	0.00	-0.01
time (sec)	N/A	0.421	0.237	0.081	1.061	0.434	0.000	0.000	0.000

Problem 526	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F(-2)	C	F	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	484	484	0	0	0	694	0	0	-1
normalized size	1	1.00	0.00	0.00	0.00	1.43	0.00	0.00	-0.00
time (sec)	N/A	0.875	2.830	0.161	0.000	0.440	0.000	0.000	0.000

Problem 527	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F(-2)	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	103	103	102	993	0	330	139	124	105
normalized size	1	1.00	0.99	9.64	0.00	3.20	1.35	1.20	1.02
time (sec)	N/A	0.157	0.158	0.172	0.000	0.456	1.203	0.442	3.807

Problem 528	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F(-2)	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	103	103	102	993	0	330	139	124	105
normalized size	1	1.00	0.99	9.64	0.00	3.20	1.35	1.20	1.02
time (sec)	N/A	0.141	0.034	0.026	0.000	0.456	1.213	0.488	0.002

Problem 529	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	9	9	9	9	8	8	7	8	8
normalized size	1	1.00	1.00	1.00	0.89	0.89	0.78	0.89	0.89
time (sec)	N/A	0.011	0.008	0.015	1.023	0.397	0.076	0.308	0.056

Problem 530	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	20	19	18	23	14	28	18
normalized size	1	1.00	1.00	0.95	0.90	1.15	0.70	1.40	0.90
time (sec)	N/A	0.134	0.027	0.021	1.107	0.398	0.094	0.293	0.064

Problem 531	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	33	32	30	38	0	0	-1
normalized size	1	1.00	0.97	0.94	0.88	1.12	0.00	0.00	-0.03
time (sec)	N/A	0.250	0.047	0.030	0.896	0.416	0.000	0.000	0.000

Problem 532	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	20	25	22	20	19	22	20
normalized size	1	1.00	1.00	1.25	1.10	1.00	0.95	1.10	1.00
time (sec)	N/A	0.020	0.018	0.026	0.931	0.405	0.112	0.376	3.558

Problem 533	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	50	50	44	64	57	61	42	0	52
normalized size	1	1.00	0.88	1.28	1.14	1.22	0.84	0.00	1.04
time (sec)	N/A	0.288	0.067	0.028	1.265	0.422	0.148	0.000	3.617

Problem 534	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	75	75	63	134	74	114	0	0	-1
normalized size	1	1.00	0.84	1.79	0.99	1.52	0.00	0.00	-0.01
time (sec)	N/A	0.491	0.115	0.079	1.266	0.417	0.000	0.000	0.000

Problem 535	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	14	14	13	12	13	13
normalized size	1	1.00	1.00	1.08	1.08	1.00	0.92	1.00	1.00
time (sec)	N/A	0.012	0.011	0.008	1.091	0.393	0.093	0.318	3.478

Problem 536	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	23	23	16	18	19	17	17	18	17
normalized size	1	1.00	0.70	0.78	0.83	0.74	0.74	0.78	0.74
time (sec)	N/A	0.019	0.011	0.010	1.045	0.407	0.124	0.291	0.121

Problem 537	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	36	36	36	36	0	126	36	35	35
normalized size	1	1.00	1.00	1.00	0.00	3.50	1.00	0.97	0.97
time (sec)	N/A	0.057	0.025	0.007	0.000	0.432	0.259	0.254	0.206

Problem 538	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	159	159	123	180	0	214	0	0	-1
normalized size	1	1.00	0.77	1.13	0.00	1.35	0.00	0.00	-0.01
time (sec)	N/A	0.304	0.069	0.018	0.000	0.418	0.000	0.000	0.000

Problem 539	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F(-2)	C	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	244	244	185	0	0	316	0	0	-1
normalized size	1	1.00	0.76	0.00	0.00	1.30	0.00	0.00	-0.00
time (sec)	N/A	0.499	0.038	0.031	0.000	0.425	0.000	0.000	0.000

Problem 540	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F(-2)	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	47	135	0	189	66	48	47
normalized size	1	1.00	1.00	2.87	0.00	4.02	1.40	1.02	1.00
time (sec)	N/A	0.064	0.055	0.053	0.000	0.450	0.376	0.397	3.643

Problem 541	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	B	F(-2)	A	F(-1)	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	203	203	0	433	0	353	0	0	-1
normalized size	1	1.00	0.00	2.13	0.00	1.74	0.00	0.00	-0.00
time (sec)	N/A	0.407	0.461	0.094	0.000	0.436	0.000	0.000	0.000

Problem 542	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F(-2)	C	F(-1)	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	310	310	0	0	0	489	0	0	-1
normalized size	1	1.00	0.00	0.00	0.00	1.58	0.00	0.00	-0.00
time (sec)	N/A	0.660	0.198	0.155	0.000	0.435	0.000	0.000	0.000

Problem 543	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	F(-2)	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	53	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.149	0.679	0.174	0.000	0.000	0.000	0.000	0.000

Problem 544	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	F(-1)	F	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	154	154	0	0	0	0	0	0	-1
normalized size	1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.265	1.643	0.150	0.000	0.000	0.000	0.000	0.000

Problem 545	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	F	F	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	112	112	0	0	0	0	0	0	-1
normalized size	1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.227	1.385	0.154	0.000	130.850	0.000	0.000	0.000

Problem 546	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	F	F	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	70	70	0	0	0	0	0	0	-1
normalized size	1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.122	0.524	0.156	0.000	58.683	0.000	0.000	0.000

Problem 547	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	36	36	26	37	36	26	128	49	40
normalized size	1	1.00	0.72	1.03	1.00	0.72	3.56	1.36	1.11
time (sec)	N/A	0.015	0.011	0.008	1.098	0.426	0.315	0.287	0.100

Problem 548	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	53	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.152	0.392	0.161	0.000	0.443	0.000	0.000	0.000

Problem 549	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	53	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.149	1.267	0.149	0.000	13.172	0.000	0.000	0.000

Problem 550	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	50	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.230	0.726	0.114	0.000	0.000	0.000	0.000	0.000

Problem 551	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	F	F	F(-1)	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	152	152	0	0	0	0	0	0	-1
normalized size	1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.327	1.344	0.105	0.000	5.285	0.000	0.000	0.000

Problem 552	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	F	F	F(-1)	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	110	110	0	0	0	0	0	0	-1
normalized size	1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.303	1.305	0.104	0.000	3.677	0.000	0.000	0.000

Problem 553	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	F	F	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	0	0	0	0	0	0	-1
normalized size	1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.180	0.464	0.106	0.000	2.050	0.000	0.000	0.000

Problem 554	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	14	32	31	25	20	38	14
normalized size	1	1.00	1.00	2.29	2.21	1.79	1.43	2.71	1.00
time (sec)	N/A	0.008	0.003	0.009	0.961	0.379	0.141	0.460	3.426

Problem 555	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	50	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.233	0.481	0.107	0.000	0.426	0.000	0.000	0.000

Problem 556	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	50	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.225	1.396	0.105	0.000	3.645	0.000	0.000	0.000

Problem 557	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	77	77	77	0	0	25	0	0	-1
normalized size	1	1.00	1.00	0.00	0.00	0.32	0.00	0.00	-0.01
time (sec)	N/A	0.241	0.321	0.110	0.000	0.732	0.000	0.000	0.000

Problem 558	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	29	29	29	0	0	25	0	0	-1
normalized size	1	1.00	1.00	0.00	0.00	0.86	0.00	0.00	-0.03
time (sec)	N/A	0.106	0.258	0.100	0.000	0.620	0.000	0.000	0.000

Problem 559	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	29	29	29	0	0	25	0	0	-1
normalized size	1	1.00	1.00	0.00	0.00	0.86	0.00	0.00	-0.03
time (sec)	N/A	0.108	0.255	0.100	0.000	0.610	0.000	0.000	0.000

Problem 560	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	28	0	0	24	0	0	-1
normalized size	1	1.00	1.00	0.00	0.00	0.86	0.00	0.00	-0.04
time (sec)	N/A	0.096	0.238	0.102	0.000	0.628	0.000	0.000	0.000

Problem 561	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	29	29	29	0	0	0	0	0	-1
normalized size	1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.104	0.249	0.099	0.000	0.605	0.000	0.000	0.000

Problem 562	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	29	29	29	0	0	0	0	0	-1
normalized size	1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.105	0.299	0.103	0.000	1.128	0.000	0.000	0.000

Problem 563	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	35	69	67	71	279	2679	35
normalized size	1	1.00	0.71	1.41	1.37	1.45	5.69	54.67	0.71
time (sec)	N/A	0.064	0.033	0.010	0.923	0.434	2.288	0.849	0.053

Problem 564	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	26	25	37	34	97	1020	23
normalized size	1	1.00	0.84	0.81	1.19	1.10	3.13	32.90	0.74
time (sec)	N/A	0.029	0.017	0.007	0.794	0.404	1.150	0.292	0.020

Problem 565	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	14	15	0	14	24	242	14
normalized size	1	1.00	1.00	1.07	0.00	1.00	1.71	17.29	1.00
time (sec)	N/A	0.012	0.006	0.005	0.000	0.401	0.568	0.249	3.596

Problem 566	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	8	8	10	56	8	10	0	0	8
normalized size	1	1.00	1.25	7.00	1.00	1.25	0.00	0.00	1.00
time (sec)	N/A	0.042	0.012	0.064	1.342	0.397	0.000	0.000	0.026

Problem 567	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	C	A	A	F	F	B
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	26	26	0	160	16	34	0	0	28
normalized size	1	1.00	0.00	6.15	0.62	1.31	0.00	0.00	1.08
time (sec)	N/A	0.062	0.053	0.066	1.304	0.401	0.000	0.000	3.504

Problem 568	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	C	A	A	F	F	B
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	51	51	0	225	19	61	0	0	59
normalized size	1	1.00	0.00	4.41	0.37	1.20	0.00	0.00	1.16
time (sec)	N/A	0.085	0.064	0.069	1.325	0.418	0.000	0.000	0.053

Problem 569	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	21	20	0	19	41	318	19
normalized size	1	1.00	1.11	1.05	0.00	1.00	2.16	16.74	1.00
time (sec)	N/A	0.041	0.017	0.006	0.000	0.408	2.413	0.281	3.514

Problem 570	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	F(-2)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	19	0	18	0	231	18
normalized size	1	1.00	1.00	1.06	0.00	1.00	0.00	12.83	1.00
time (sec)	N/A	0.021	0.017	0.005	0.000	0.415	0.000	0.265	3.585

Problem 571	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	61	61	43	73	72	75	333	1859	43
normalized size	1	1.00	0.70	1.20	1.18	1.23	5.46	30.48	0.70
time (sec)	N/A	0.070	0.032	0.008	0.974	0.412	1.744	0.356	3.561

Problem 572	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F(-2)	C	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	770	770	2441	0	0	1859	0	0	-1
normalized size	1	1.00	3.17	0.00	0.00	2.41	0.00	0.00	-0.00
time (sec)	N/A	1.374	4.675	0.532	0.000	0.513	0.000	0.000	0.000

Problem 573	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F(-2)	C	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	599	599	1412	0	0	1193	0	0	-1
normalized size	1	1.00	2.36	0.00	0.00	1.99	0.00	0.00	-0.00
time (sec)	N/A	1.002	2.684	0.408	0.000	0.467	0.000	0.000	0.000

Problem 574	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F(-2)	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	428	428	677	1249	0	651	0	0	-1
normalized size	1	1.00	1.58	2.92	0.00	1.52	0.00	0.00	-0.00
time (sec)	N/A	0.583	1.751	0.046	0.000	0.446	0.000	0.000	0.000

Problem 575	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F(-2)	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	95	95	94	183	0	291	116	127	91
normalized size	1	1.00	0.99	1.93	0.00	3.06	1.22	1.34	0.96
time (sec)	N/A	0.151	0.170	0.024	0.000	0.451	1.030	0.259	3.785

Problem 576	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	84	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	1.018	0.436	0.239	0.000	0.436	0.000	0.000	0.000

Problem 577	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	84	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.870	6.008	0.288	0.000	0.426	0.000	0.000	0.000

Problem 578	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	150	150	398	285	0	251	0	0	-1
normalized size	1	1.00	2.65	1.90	0.00	1.67	0.00	0.00	-0.01
time (sec)	N/A	0.672	0.433	0.050	0.000	0.542	0.000	0.000	0.000

Problem 579	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	65	65	85	0	0	0	0	0	-1
normalized size	1	1.00	1.31	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.049	0.180	0.056	0.000	0.769	0.000	0.000	0.000

Problem 580	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	65	65	85	0	0	0	0	0	-1
normalized size	1	1.00	1.31	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.033	0.113	0.053	0.000	0.469	0.000	0.000	0.000

Problem 581	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	56	83	0	0	0	0	0	58
normalized size	1	1.00	1.48	0.00	0.00	0.00	0.00	0.00	1.04
time (sec)	N/A	0.022	0.092	0.093	0.000	0.428	0.000	0.000	4.007

Problem 582	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	57	57	50	0	0	0	0	0	-1
normalized size	1	1.00	0.88	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.064	0.106	0.155	0.000	0.437	0.000	0.000	0.000

Problem 583	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	66	66	81	0	0	0	0	0	-1
normalized size	1	1.00	1.23	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.045	0.123	0.052	0.000	0.456	0.000	0.000	0.000

Problem 584	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	85	0	0	0	0	0	-1
normalized size	1	1.00	1.25	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.045	0.124	0.051	0.000	0.449	0.000	0.000	0.000

Problem 585	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	77	77	94	0	0	0	0	0	-1
normalized size	1	1.00	1.22	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.055	0.166	0.081	0.000	0.472	0.000	0.000	0.000

Problem 586	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	A	F	A	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	76	76	0	0	0	55	0	56	-1
normalized size	1	1.00	0.00	0.00	0.00	0.72	0.00	0.74	-0.01
time (sec)	N/A	0.157	0.090	0.109	0.000	0.428	0.000	0.274	0.000

Problem 587	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	A	F	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	137	136	0	0	0	143	0	0	-1
normalized size	1	0.99	0.00	0.00	0.00	1.04	0.00	0.00	-0.01
time (sec)	N/A	0.390	0.167	84.216	0.000	0.422	0.000	0.000	0.000

Problem 588	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	123	123	123	0	0	119	0	0	-1
normalized size	1	1.00	1.00	0.00	0.00	0.97	0.00	0.00	-0.01
time (sec)	N/A	0.249	0.248	0.360	0.000	0.432	0.000	0.000	0.000

Problem 589	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	115	115	115	0	0	112	838	0	-1
normalized size	1	1.00	1.00	0.00	0.00	0.97	7.29	0.00	-0.01
time (sec)	N/A	0.207	0.560	0.386	0.000	0.420	110.480	0.000	0.000

Problem 590	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	118	118	118	0	0	116	532	101	-1
normalized size	1	1.00	1.00	0.00	0.00	0.98	4.51	0.86	-0.01
time (sec)	N/A	0.127	0.109	0.177	0.000	0.420	29.711	0.404	0.000

Problem 591	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F(-1)	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	67	67	67	0	0	57	0	0	49
normalized size	1	1.00	1.00	0.00	0.00	0.85	0.00	0.00	0.73
time (sec)	N/A	0.144	0.051	180.000	0.000	0.412	0.000	0.000	3.745

Problem 592	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	121	121	121	0	0	119	0	0	-1
normalized size	1	1.00	1.00	0.00	0.00	0.98	0.00	0.00	-0.01
time (sec)	N/A	0.234	0.213	0.608	0.000	0.413	0.000	0.000	0.000

Problem 593	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	118	118	117	0	0	114	0	0	-1
normalized size	1	1.00	0.99	0.00	0.00	0.97	0.00	0.00	-0.01
time (sec)	N/A	0.231	0.213	0.765	0.000	0.410	0.000	0.000	0.000

Problem 594	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.076	1.817	0.863	0.000	0.402	0.000	0.000	0.000

Problem 595	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	F	A	F	F	A	F(-1)	F	F
verified	N/A	N/A	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	502	0	396	0	0	513	0	0	-1
normalized size	1	0.00	0.79	0.00	0.00	1.02	0.00	0.00	-0.00
time (sec)	N/A	0.376	1.593	0.699	0.000	0.418	0.000	0.000	0.000

Problem 596	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	F	A	F	F	A	F(-1)	F	F
verified	N/A	N/A	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	372	0	303	0	0	367	0	0	-1
normalized size	1	0.00	0.81	0.00	0.00	0.99	0.00	0.00	-0.00
time (sec)	N/A	0.306	0.815	0.645	0.000	0.419	0.000	0.000	0.000

Problem 597	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	F	A	F	F	A	A	F	F
verified	N/A	N/A	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	242	0	204	0	0	231	1329	0	-1
normalized size	1	0.00	0.84	0.00	0.00	0.95	5.49	0.00	-0.00
time (sec)	N/A	0.230	0.385	0.673	0.000	0.412	113.967	0.000	0.000

Problem 598	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	118	118	118	0	0	116	532	101	-1
normalized size	1	1.00	1.00	0.00	0.00	0.98	4.51	0.86	-0.01
time (sec)	N/A	0.094	0.025	0.015	0.000	0.417	29.051	0.403	0.000

Problem 599	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.084	0.523	0.531	0.000	0.426	0.000	0.000	0.000

Problem 600	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.085	2.631	0.604	0.000	0.423	0.000	0.000	0.000

Problem 601	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.083	3.421	0.849	0.000	0.438	0.000	0.000	0.000

Problem 602	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F(-1)	F	A	F(-1)	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	153	152	0	0	0	169	0	0	-1
normalized size	1	0.99	0.00	0.00	0.00	1.10	0.00	0.00	-0.01
time (sec)	N/A	0.757	0.250	180.000	0.000	0.416	0.000	0.000	0.000

Problem 603	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	133	133	129	0	0	134	0	0	-1
normalized size	1	1.00	0.97	0.00	0.00	1.01	0.00	0.00	-0.01
time (sec)	N/A	0.411	0.357	0.589	0.000	0.425	0.000	0.000	0.000

Problem 604	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	122	122	120	0	0	128	0	0	-1
normalized size	1	1.00	0.98	0.00	0.00	1.05	0.00	0.00	-0.01
time (sec)	N/A	0.369	0.726	0.611	0.000	0.424	0.000	0.000	0.000

Problem 605	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	126	126	123	0	0	131	0	116	-1
normalized size	1	1.00	0.98	0.00	0.00	1.04	0.00	0.92	-0.01
time (sec)	N/A	0.232	0.098	0.331	0.000	0.433	0.000	0.549	0.000

Problem 606	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F(-1)	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	70	70	59	0	0	66	0	0	63
normalized size	1	1.00	0.84	0.00	0.00	0.94	0.00	0.00	0.90
time (sec)	N/A	0.268	0.048	180.000	0.000	0.417	0.000	0.000	3.691

Problem 607	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	128	128	126	0	0	134	0	0	-1
normalized size	1	1.00	0.98	0.00	0.00	1.05	0.00	0.00	-0.01
time (sec)	N/A	0.412	0.262	0.747	0.000	0.436	0.000	0.000	0.000

Problem 608	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	126	126	121	0	0	129	0	0	-1
normalized size	1	1.00	0.96	0.00	0.00	1.02	0.00	0.00	-0.01
time (sec)	N/A	0.405	0.317	0.987	0.000	0.427	0.000	0.000	0.000

Problem 609	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.089	1.422	1.020	0.000	0.407	0.000	0.000	0.000

Problem 610	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	F	A	F	F	A	F(-1)	F	F
verified	N/A	N/A	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	535	0	434	0	0	564	0	0	-1
normalized size	1	0.00	0.81	0.00	0.00	1.05	0.00	0.00	-0.00
time (sec)	N/A	0.493	2.424	0.782	0.000	0.418	0.000	0.000	0.000

Problem 611	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	F	A	F	F	A	F(-1)	F	F
verified	N/A	N/A	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	397	0	331	0	0	407	0	0	-1
normalized size	1	0.00	0.83	0.00	0.00	1.03	0.00	0.00	-0.00
time (sec)	N/A	0.367	1.142	0.779	0.000	0.412	0.000	0.000	0.000

Problem 612	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	F	A	F	F	A	F(-1)	F	F
verified	N/A	N/A	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	257	0	221	0	0	259	0	0	-1
normalized size	1	0.00	0.86	0.00	0.00	1.01	0.00	0.00	-0.00
time (sec)	N/A	0.306	0.516	0.799	0.000	0.415	0.000	0.000	0.000

Problem 613	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	126	126	123	0	0	131	0	116	-1
normalized size	1	1.00	0.98	0.00	0.00	1.04	0.00	0.92	-0.01
time (sec)	N/A	0.143	0.065	0.024	0.000	0.404	0.000	0.553	0.000

Problem 614	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.094	0.995	0.669	0.000	0.419	0.000	0.000	0.000

Problem 615	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.102	4.652	0.754	0.000	0.423	0.000	0.000	0.000

Problem 616	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.099	7.112	1.038	0.000	0.421	0.000	0.000	0.000

Problem 617	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	18	17	17	24	17	17
normalized size	1	1.00	1.00	1.06	1.00	1.00	1.41	1.00	1.00
time (sec)	N/A	0.052	0.057	0.030	1.002	0.427	0.145	0.230	3.684

Problem 618	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	19	21	20	20	32	20	20
normalized size	1	1.00	0.95	1.05	1.00	1.00	1.60	1.00	1.00
time (sec)	N/A	0.166	0.416	0.028	0.945	0.406	0.570	0.218	3.998

Problem 619	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	44	0	0	23	0	0	49
normalized size	1	1.00	0.90	0.00	0.00	0.47	0.00	0.00	1.00
time (sec)	N/A	0.200	0.052	1.024	0.000	0.422	0.000	0.000	3.689

Problem 620	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	C	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	90	90	49	145	2381	109	160	267	145
normalized size	1	1.00	0.54	1.61	26.46	1.21	1.78	2.97	1.61
time (sec)	N/A	0.182	0.038	0.029	8.250	0.405	0.291	0.247	3.793

Problem 621	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	C	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	64	64	36	64	1223	55	68	119	64
normalized size	1	1.00	0.56	1.00	19.11	0.86	1.06	1.86	1.00
time (sec)	N/A	0.161	0.033	0.029	5.311	0.398	0.201	0.232	3.614

Problem 622	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	C	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	23	24	501	23	22	44	23
normalized size	1	1.00	0.61	0.63	13.18	0.61	0.58	1.16	0.61
time (sec)	N/A	0.096	0.029	0.025	2.958	0.400	0.147	0.234	0.102

Problem 623	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	12	11	11	10	11	13
normalized size	1	1.00	1.00	1.00	0.92	0.92	0.83	0.92	1.08
time (sec)	N/A	0.019	0.039	0.028	1.274	0.395	0.110	0.213	0.075

Problem 624	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	11	11	10	19	0	11	10	0	11
normalized size	1	1.00	0.91	1.73	0.00	1.00	0.91	0.00	1.00
time (sec)	N/A	0.177	0.025	0.033	0.000	0.396	21.019	0.000	3.787

Problem 625	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	35	45	0	49	24	0	44
normalized size	1	1.00	0.92	1.18	0.00	1.29	0.63	0.00	1.16
time (sec)	N/A	0.197	0.055	0.034	0.000	0.392	159.334	0.000	3.989

Problem 626	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	72	72	50	70	0	111	0	0	62
normalized size	1	1.00	0.69	0.97	0.00	1.54	0.00	0.00	0.86
time (sec)	N/A	0.241	0.071	0.033	0.000	0.398	0.000	0.000	4.043

Problem 627	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	142	142	47	119	0	0	0	93	135
normalized size	1	1.00	0.33	0.84	0.00	0.00	0.00	0.65	0.95
time (sec)	N/A	0.633	0.202	0.036	0.000	0.420	0.000	0.463	4.217

Problem 628	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	112	112	46	94	0	0	0	79	117
normalized size	1	1.00	0.41	0.84	0.00	0.00	0.00	0.71	1.04
time (sec)	N/A	0.457	0.127	0.036	0.000	0.422	0.000	0.405	3.910

Problem 629	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	47	69	0	0	94	65	102
normalized size	1	1.00	0.57	0.84	0.00	0.00	1.15	0.79	1.24
time (sec)	N/A	0.363	0.113	0.036	0.000	0.412	86.527	0.324	3.767

Problem 630	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	52	52	46	44	0	0	78	47	76
normalized size	1	1.00	0.88	0.85	0.00	0.00	1.50	0.90	1.46
time (sec)	N/A	0.235	0.048	0.035	0.000	0.402	5.805	0.310	3.508

Problem 631	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	F	F	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	46	18	0	0	49	21	49
normalized size	1	1.00	2.19	0.86	0.00	0.00	2.33	1.00	2.33
time (sec)	N/A	0.264	0.061	0.037	0.000	0.405	4.433	0.212	3.896

Problem 632	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	51	51	62	45	0	0	80	0	79
normalized size	1	1.00	1.22	0.88	0.00	0.00	1.57	0.00	1.55
time (sec)	N/A	0.315	0.099	0.038	0.000	0.402	6.487	0.000	4.005

Problem 633	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	85	85	77	70	0	0	105	0	104
normalized size	1	1.00	0.91	0.82	0.00	0.00	1.24	0.00	1.22
time (sec)	N/A	0.348	0.128	0.036	0.000	0.420	37.582	0.000	4.200

Problem 634	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	115	115	91	95	0	0	0	0	129
normalized size	1	1.00	0.79	0.83	0.00	0.00	0.00	0.00	1.12
time (sec)	N/A	0.355	0.177	0.034	0.000	0.412	0.000	0.000	4.664

Problem 635	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	145	145	103	120	0	0	0	0	154
normalized size	1	1.00	0.71	0.83	0.00	0.00	0.00	0.00	1.06
time (sec)	N/A	0.379	0.241	0.036	0.000	0.433	0.000	0.000	5.698

Problem 636	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	A	B	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	8	8	42	37	14	18	7	14	-1
normalized size	1	1.00	5.25	4.62	1.75	2.25	0.88	1.75	-0.12
time (sec)	N/A	0.028	0.018	0.051	2.288	0.412	0.988	0.204	0.000

Problem 637	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	8	7	7	15	7	7
normalized size	1	1.00	1.00	0.67	0.58	0.58	1.25	0.58	0.58
time (sec)	N/A	0.019	0.003	0.033	2.002	0.384	0.111	0.204	3.584

Problem 638	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	4	4	4	4	15	15	15	16	15
normalized size	1	1.00	1.00	1.00	3.75	3.75	3.75	4.00	3.75
time (sec)	N/A	0.020	0.003	0.032	1.370	0.401	0.107	0.212	0.128

Problem 639	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	20	14	26	32	15	30	13
normalized size	1	1.00	1.00	0.70	1.30	1.60	0.75	1.50	0.65
time (sec)	N/A	0.022	0.006	0.033	2.317	0.407	0.118	0.208	0.155

Problem 640	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	36	36	36	26	25	34	42	25	24
normalized size	1	1.00	1.00	0.72	0.69	0.94	1.17	0.69	0.67
time (sec)	N/A	0.029	0.015	0.038	2.085	0.409	1.556	0.198	0.092

Problem 641	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	14	12	11	11	10	11	11
normalized size	1	1.00	0.64	0.55	0.50	0.50	0.45	0.50	0.50
time (sec)	N/A	0.021	0.002	0.025	0.772	0.404	0.085	0.210	0.037

Problem 642	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	29	29	26	21	20	35	24	20	20
normalized size	1	1.00	0.90	0.72	0.69	1.21	0.83	0.69	0.69
time (sec)	N/A	0.027	0.012	0.035	1.770	0.413	1.345	0.220	3.352

Problem 643	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	14	11	12	21	0	21	15
normalized size	1	1.00	1.00	0.79	0.86	1.50	0.00	1.50	1.07
time (sec)	N/A	0.036	0.009	0.040	1.805	0.400	0.000	0.229	3.643

Problem 644	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	16	15	15	15	16	15
normalized size	1	1.00	1.00	1.33	1.25	1.25	1.25	1.33	1.25
time (sec)	N/A	0.020	0.003	0.038	0.929	0.403	0.106	0.222	0.139

Problem 645	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	11	10	10	8	10	10
normalized size	1	1.00	1.00	0.85	0.77	0.77	0.62	0.77	0.77
time (sec)	N/A	0.009	0.002	0.023	0.796	0.398	0.086	0.210	0.059

Problem 646	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	16	15	20	14	15	16
normalized size	1	1.00	1.00	1.00	0.94	1.25	0.88	0.94	1.00
time (sec)	N/A	0.005	0.005	0.025	0.807	0.394	0.081	0.212	3.332

Problem 647	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	18	13	13	14	13	13
normalized size	1	1.00	1.00	1.00	0.72	0.72	0.78	0.72	0.72
time (sec)	N/A	0.026	0.009	0.032	0.955	0.394	0.085	0.213	0.075

Problem 648	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	4	4	4	4	3	20	3	3	3
normalized size	1	1.00	1.00	1.00	0.75	5.00	0.75	0.75	0.75
time (sec)	N/A	0.023	0.004	0.039	2.068	0.407	0.706	0.215	3.533

Problem 649	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	10	10	10	8	7	7	17	7	7
normalized size	1	1.00	1.00	0.80	0.70	0.70	1.70	0.70	0.70
time (sec)	N/A	0.020	0.003	0.033	2.114	0.391	0.113	0.213	3.369

Problem 650	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	23	20	17	21	17	18	17
normalized size	1	1.00	0.85	0.74	0.63	0.78	0.63	0.67	0.63
time (sec)	N/A	0.019	0.020	0.041	0.743	0.403	0.103	0.211	0.075

Problem 651	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	11	10	10	10	10	10
normalized size	1	1.00	1.00	0.92	0.83	0.83	0.83	0.83	0.83
time (sec)	N/A	0.035	0.011	0.025	1.108	0.398	0.090	0.212	3.328

Problem 652	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	6	6	6	6	15	15	15	16	15
normalized size	1	1.00	1.00	1.00	2.50	2.50	2.50	2.67	2.50
time (sec)	N/A	0.019	0.002	0.031	0.773	0.396	0.104	0.213	0.076

Problem 653	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	4	4	4	4	3	3	15	3	3
normalized size	1	1.00	1.00	1.00	0.75	0.75	3.75	0.75	0.75
time (sec)	N/A	0.019	0.003	0.032	1.686	0.398	0.109	0.204	0.052

Problem 654	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	14	14	17	10	11	8	12	11
normalized size	1	1.17	1.17	1.42	0.83	0.92	0.67	1.00	0.92
time (sec)	N/A	0.040	0.009	0.042	0.950	0.403	0.095	0.213	0.056

Problem 655	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	10	12	12	14	8	11	8	11	11
normalized size	1	1.20	1.20	1.40	0.80	1.10	0.80	1.10	1.10
time (sec)	N/A	0.037	0.008	0.038	0.879	0.410	0.096	0.212	3.537

Problem 656	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	30	14	13	10	14	22
normalized size	1	1.00	1.00	1.67	0.78	0.72	0.56	0.78	1.22
time (sec)	N/A	0.044	0.009	0.043	1.019	0.425	0.101	0.215	3.340

Problem 657	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	4	4	4	4	3	16	3	16	3
normalized size	1	1.00	1.00	1.00	0.75	4.00	0.75	4.00	0.75
time (sec)	N/A	0.021	0.004	0.039	1.650	0.401	0.644	0.190	0.076

Problem 658	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	11	11	11	9	8	8	8	8	8
normalized size	1	1.00	1.00	0.82	0.73	0.73	0.73	0.73	0.73
time (sec)	N/A	0.024	0.004	0.025	0.876	0.401	0.208	0.204	3.457

Problem 659	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	14	13	13	0	13	13
normalized size	1	1.00	1.00	0.78	0.72	0.72	0.00	0.72	0.72
time (sec)	N/A	0.061	0.017	0.033	2.245	0.403	0.000	0.225	3.707

Problem 660	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	30	21	20	29	0	29	20
normalized size	1	1.00	0.97	0.68	0.65	0.94	0.00	0.94	0.65
time (sec)	N/A	0.025	0.010	0.036	2.013	0.410	0.000	0.219	3.589

Problem 661	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	24	19	18	29	0	29	18
normalized size	1	1.00	0.89	0.70	0.67	1.07	0.00	1.07	0.67
time (sec)	N/A	0.023	0.009	0.034	1.693	0.409	0.000	0.226	3.546

Problem 662	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	10	10	10	8	7	7	17	7	7
normalized size	1	1.00	1.00	0.80	0.70	0.70	1.70	0.70	0.70
time (sec)	N/A	0.126	0.016	0.033	1.922	0.403	0.142	0.216	0.067

Problem 663	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	13	17	11	11	24	11	16
normalized size	1	1.00	0.46	0.61	0.39	0.39	0.86	0.39	0.57
time (sec)	N/A	0.042	0.001	0.029	0.681	0.403	3.113	0.255	3.565

Problem 664	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	13	16	16	10	16	12
normalized size	1	1.00	1.00	0.81	1.00	1.00	0.62	1.00	0.75
time (sec)	N/A	0.024	0.004	0.040	1.258	0.394	0.667	0.180	3.770

Problem 665	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	16	15	15	15	16	15
normalized size	1	1.00	1.00	1.33	1.25	1.25	1.25	1.33	1.25
time (sec)	N/A	0.022	0.004	0.038	1.048	0.404	0.108	0.193	3.654

Problem 666	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	10	10	10	8	7	7	17	7	7
normalized size	1	1.00	1.00	0.80	0.70	0.70	1.70	0.70	0.70
time (sec)	N/A	0.021	0.004	0.032	2.283	0.386	0.113	0.215	0.057

Problem 667	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	14	0	9	18	8	18	-1
normalized size	1	1.00	1.00	0.00	0.64	1.29	0.57	1.29	-0.07
time (sec)	N/A	0.023	0.005	0.095	1.253	0.389	0.887	0.210	0.000

Problem 668	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	28	53	29	29	32	25	25
normalized size	1	1.00	0.80	1.51	0.83	0.83	0.91	0.71	0.71
time (sec)	N/A	0.179	0.055	0.158	0.864	0.423	1.825	0.223	3.591

Problem 669	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	11	11	11	9	8	8	7	8	8
normalized size	1	1.00	1.00	0.82	0.73	0.73	0.64	0.73	0.73
time (sec)	N/A	0.009	0.002	0.023	0.907	0.387	0.085	0.194	0.048

Problem 670	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	11	11	11	9	8	8	7	8	8
normalized size	1	1.00	1.00	0.82	0.73	0.73	0.64	0.73	0.73
time (sec)	N/A	0.016	0.002	0.023	0.718	0.390	0.088	0.180	3.513

Problem 671	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	9	9	9	7	6	6	7	6	6
normalized size	1	1.00	1.00	0.78	0.67	0.67	0.78	0.67	0.67
time (sec)	N/A	0.010	0.002	0.024	0.881	0.387	0.199	0.194	3.490

Problem 672	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	9	9	9	7	6	6	7	6	6
normalized size	1	1.00	1.00	0.78	0.67	0.67	0.78	0.67	0.67
time (sec)	N/A	0.011	0.002	0.024	0.946	0.397	0.368	0.211	3.571

Problem 673	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	34	32	59	31	31	31	31
normalized size	1	1.00	0.50	0.47	0.87	0.46	0.46	0.46	0.46
time (sec)	N/A	0.107	0.023	0.026	0.856	0.379	0.103	0.211	3.533

Problem 674	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	26	22	19	19	20	19	21
normalized size	1	1.00	0.93	0.79	0.68	0.68	0.71	0.68	0.75
time (sec)	N/A	0.024	0.015	0.030	1.012	0.383	0.094	0.219	3.499

Problem 675	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	26	26	23	20	19	18	22	18	18
normalized size	1	1.00	0.88	0.77	0.73	0.69	0.85	0.69	0.69
time (sec)	N/A	0.022	0.012	0.032	0.886	0.404	0.106	0.219	0.065

Problem 676	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	9	9	9	9	8	8	7	8	8
normalized size	1	1.00	1.00	1.00	0.89	0.89	0.78	0.89	0.89
time (sec)	N/A	0.024	0.008	0.035	0.888	0.393	0.080	0.195	0.060

Problem 677	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	20	22	17	21	20	17	17
normalized size	1	1.00	0.74	0.81	0.63	0.78	0.74	0.63	0.63
time (sec)	N/A	0.010	0.027	0.085	0.826	0.414	0.440	0.216	0.029

Problem 678	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	16	15	15	14	15	15
normalized size	1	1.00	1.00	0.94	0.88	0.88	0.82	0.88	0.88
time (sec)	N/A	0.032	0.014	0.039	0.726	0.413	0.124	0.213	3.543

Problem 679	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	11	10	10	8	10	10
normalized size	1	1.00	1.00	0.92	0.83	0.83	0.67	0.83	0.83
time (sec)	N/A	0.022	0.008	0.032	0.877	0.412	0.087	0.211	3.536

Problem 680	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	22	22	19	21	26	19	19
normalized size	1	1.00	0.81	0.81	0.70	0.78	0.96	0.70	0.70
time (sec)	N/A	0.011	0.029	0.082	0.751	0.423	0.298	0.213	0.031

Problem 681	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	5	5	5	5	4	16	0	6	6
normalized size	1	1.00	1.00	1.00	0.80	3.20	0.00	1.20	1.20
time (sec)	N/A	0.014	0.006	0.026	0.874	0.391	0.000	0.214	0.047

Problem 682	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	21	22	16	24	17	19	19
normalized size	1	1.00	1.00	1.05	0.76	1.14	0.81	0.90	0.90
time (sec)	N/A	0.025	0.016	0.031	0.976	0.408	0.102	0.212	0.070

Problem 683	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	22	22	19	21	24	19	19
normalized size	1	1.00	0.81	0.81	0.70	0.78	0.89	0.70	0.70
time (sec)	N/A	0.010	0.042	0.123	0.862	0.402	0.288	0.184	3.534

Problem 684	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	28	39	52	0	41	78
normalized size	1	1.00	1.00	0.82	1.15	1.53	0.00	1.21	2.29
time (sec)	N/A	0.030	0.018	0.372	1.088	0.425	0.000	0.202	5.530

Problem 685	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	26	26	20	23	16	18	14	16	10
normalized size	1	1.00	0.77	0.88	0.62	0.69	0.54	0.62	0.38
time (sec)	N/A	0.017	0.022	0.032	0.816	0.402	0.097	0.180	0.060

Problem 686	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	10	14	13	13	12	13	13
normalized size	1	1.00	0.67	0.93	0.87	0.87	0.80	0.87	0.87
time (sec)	N/A	0.029	0.007	0.039	1.028	0.413	0.118	0.211	3.488

Problem 687	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	20	18	17	14	22	17	14
normalized size	1	1.00	0.74	0.67	0.63	0.52	0.81	0.63	0.52
time (sec)	N/A	0.026	0.011	0.033	1.007	0.393	1.992	0.210	0.062

Problem 688	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	20	18	17	14	22	17	14
normalized size	1	1.00	0.74	0.67	0.63	0.52	0.81	0.63	0.52
time (sec)	N/A	0.026	0.011	0.032	0.981	0.395	2.250	0.213	3.535

Problem 689	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	62	62	54	50	48	62	0	49	49
normalized size	1	1.00	0.87	0.81	0.77	1.00	0.00	0.79	0.79
time (sec)	N/A	0.052	0.042	0.048	1.968	0.401	0.000	0.249	4.201

Problem 690	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	12	12	19	11	10	11	11
normalized size	1	1.00	0.63	0.63	1.00	0.58	0.53	0.58	0.58
time (sec)	N/A	0.043	0.029	0.023	0.975	0.382	0.088	0.194	3.457

Problem 691	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	19	17	28	16	15	16	16
normalized size	1	1.00	0.59	0.53	0.88	0.50	0.47	0.50	0.50
time (sec)	N/A	0.051	0.030	0.024	0.953	0.382	0.091	0.209	3.526

Problem 692	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	F	A	B	A	A	A	A	B
verified	N/A	N/A	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	11	0	11	22	10	10	8	10	10
normalized size	1	0.00	1.00	2.00	0.91	0.91	0.73	0.91	0.91
time (sec)	N/A	0.145	0.044	0.053	1.298	0.392	0.453	0.186	3.594

Problem 693	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	9	9	9	7	6	6	5	6	6
normalized size	1	1.00	1.00	0.78	0.67	0.67	0.56	0.67	0.67
time (sec)	N/A	0.026	0.001	0.037	1.051	0.383	0.112	0.226	0.038

Problem 694	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	F	A	A	A	A	A	A	B
verified	N/A	N/A	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	9	0	9	18	9	18	12	16	9
normalized size	1	0.00	1.00	2.00	1.00	2.00	1.33	1.78	1.00
time (sec)	N/A	0.073	0.021	0.043	1.381	0.390	0.273	0.475	3.584

Problem 695	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	25	25	25	24	21	21	22	21	21
normalized size	1	1.00	1.00	0.96	0.84	0.84	0.88	0.84	0.84
time (sec)	N/A	0.014	0.010	0.026	0.999	0.381	0.113	0.188	3.549

Problem 696	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	40	36	33	33	37	33	33
normalized size	1	1.00	1.00	0.90	0.82	0.82	0.92	0.82	0.82
time (sec)	N/A	0.020	0.013	0.025	0.986	0.404	0.136	0.211	0.072

Problem 697	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	53	53	53	48	45	45	51	45	45
normalized size	1	1.00	1.00	0.91	0.85	0.85	0.96	0.85	0.85
time (sec)	N/A	0.026	0.018	0.025	0.930	0.375	0.155	0.214	3.426

Problem 698	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	32	26	45	83	0	29	25
normalized size	1	1.00	1.00	0.81	1.41	2.59	0.00	0.91	0.78
time (sec)	N/A	0.027	0.013	0.041	1.687	0.404	0.000	0.215	3.618

Problem 699	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	28	27	85	0	27	31
normalized size	1	1.00	1.00	0.82	0.79	2.50	0.00	0.79	0.91
time (sec)	N/A	0.029	0.013	0.041	2.032	0.398	0.000	0.216	3.617

Problem 700	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	53	53	51	42	63	110	0	44	43
normalized size	1	1.00	0.96	0.79	1.19	2.08	0.00	0.83	0.81
time (sec)	N/A	0.035	0.017	0.026	2.383	0.435	0.000	0.211	3.515

Problem 701	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	57	57	55	48	47	117	0	45	47
normalized size	1	1.00	0.96	0.84	0.82	2.05	0.00	0.79	0.82
time (sec)	N/A	0.036	0.018	0.026	2.192	0.409	0.000	0.216	3.596

Problem 702	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	20	22	17	21	24	17	19
normalized size	1	1.00	0.74	0.81	0.63	0.78	0.89	0.63	0.70
time (sec)	N/A	0.011	0.024	0.077	0.933	0.397	0.298	0.213	0.030

Problem 703	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	10	10	10	9	8	8	19	8	8
normalized size	1	1.00	1.00	0.90	0.80	0.80	1.90	0.80	0.80
time (sec)	N/A	0.023	0.007	0.033	1.928	0.410	0.119	0.215	0.080

Problem 704	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	10	10	10	18	17	17	19	18	17
normalized size	1	1.00	1.00	1.80	1.70	1.70	1.90	1.80	1.70
time (sec)	N/A	0.024	0.007	0.034	0.946	0.406	0.118	0.211	0.099

Problem 705	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	15	14	10	0	21	-1
normalized size	1	1.00	1.00	0.83	0.78	0.56	0.00	1.17	-0.06
time (sec)	N/A	0.026	0.014	0.036	0.987	0.387	0.000	0.235	0.000

Problem 706	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	19	18	26	42	17	33	17
normalized size	1	1.00	0.95	0.90	1.30	2.10	0.85	1.65	0.85
time (sec)	N/A	0.043	0.013	0.032	2.067	0.399	0.127	0.230	0.388

Problem 707	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	24	22	21	21	20	21	21
normalized size	1	1.00	0.55	0.50	0.48	0.48	0.45	0.48	0.48
time (sec)	N/A	0.035	0.008	0.024	0.848	0.392	0.091	0.219	0.028

Problem 708	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	52	52	26	24	30	23	24	23	23
normalized size	1	1.00	0.50	0.46	0.58	0.44	0.46	0.44	0.44
time (sec)	N/A	0.039	0.010	0.025	0.971	0.387	0.095	0.211	0.054

Problem 709	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	33	33	32	23	22	35	29	22	22
normalized size	1	1.00	0.97	0.70	0.67	1.06	0.88	0.67	0.67
time (sec)	N/A	0.026	0.012	0.037	2.308	0.413	1.408	0.223	0.089

Problem 710	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	50	50	33	46	37	32	41	53	32
normalized size	1	1.00	0.66	0.92	0.74	0.64	0.82	1.06	0.64
time (sec)	N/A	0.036	0.021	0.035	0.820	0.406	3.177	0.210	3.573

Problem 711	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	81	81	48	62	61	50	61	75	38
normalized size	1	1.00	0.59	0.77	0.75	0.62	0.75	0.93	0.47
time (sec)	N/A	0.045	0.028	0.041	0.969	0.387	23.176	0.180	0.194

Problem 712	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	55	55	55	47	44	44	49	44	44
normalized size	1	1.00	1.00	0.85	0.80	0.80	0.89	0.80	0.80
time (sec)	N/A	0.086	0.030	0.026	0.826	0.397	0.155	0.218	3.567

Problem 713	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	32	27	26	43	0	26	26
normalized size	1	1.00	0.91	0.77	0.74	1.23	0.00	0.74	0.74
time (sec)	N/A	0.160	0.029	0.038	2.202	0.393	59.219	0.225	3.650

Problem 714	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	29	24	23	23	24	23	24
normalized size	1	1.00	0.91	0.75	0.72	0.72	0.75	0.72	0.75
time (sec)	N/A	0.209	0.025	0.034	0.813	0.417	0.149	0.212	3.607

Problem 715	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	5	5	5	4	3	3	3	3	3
normalized size	1	1.00	1.00	0.80	0.60	0.60	0.60	0.60	0.60
time (sec)	N/A	0.005	0.005	0.033	0.935	0.405	0.643	0.197	0.029

Problem 716	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	7	7	7	5	4	4	5	0	4
normalized size	1	1.00	1.00	0.71	0.57	0.57	0.71	0.00	0.57
time (sec)	N/A	0.015	0.012	0.033	0.662	0.404	0.919	0.000	3.462

Problem 717	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	20	17	16	19	17	24	8
normalized size	1	1.00	0.91	0.77	0.73	0.86	0.77	1.09	0.36
time (sec)	N/A	0.018	0.015	0.032	0.745	0.402	0.106	0.198	3.582

Problem 718	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	4	4	4	4	7	3	15	3	3
normalized size	1	1.00	1.00	1.00	1.75	0.75	3.75	0.75	0.75
time (sec)	N/A	0.011	0.003	0.031	2.162	0.390	0.106	0.198	0.019

Problem 719	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	11	10	10	10	10	12
normalized size	1	1.00	1.00	0.85	0.77	0.77	0.77	0.77	0.92
time (sec)	N/A	0.012	0.010	0.030	0.865	0.384	0.081	0.202	0.071

Problem 720	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	6	6	6	6	19	15	15	16	15
normalized size	1	1.00	1.00	1.00	3.17	2.50	2.50	2.67	2.50
time (sec)	N/A	0.010	0.004	0.024	0.957	0.411	0.104	0.194	0.055

Problem 721	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	11	11	10	10	10	10	12
normalized size	1	1.00	0.73	0.73	0.67	0.67	0.67	0.67	0.80
time (sec)	N/A	0.014	0.015	0.025	1.000	0.397	0.081	0.199	3.405

Problem 722	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	22	18	21	18	15	17	17
normalized size	1	1.00	1.00	0.82	0.95	0.82	0.68	0.77	0.77
time (sec)	N/A	0.028	0.008	0.027	0.484	0.394	0.115	0.210	0.055

Problem 723	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	29	25	24	25	26	30	22
normalized size	1	1.00	0.94	0.81	0.77	0.81	0.84	0.97	0.71
time (sec)	N/A	0.037	0.015	0.030	0.888	0.406	0.138	0.211	3.594

Problem 724	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	21	27	22	21	29	0	21
normalized size	1	1.00	0.95	1.23	1.00	0.95	1.32	0.00	0.95
time (sec)	N/A	0.027	0.013	0.091	1.911	0.416	0.260	0.000	3.477

Problem 725	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	23	40	40	25	39	0	-1
normalized size	1	1.00	0.68	1.18	1.18	0.74	1.15	0.00	-0.03
time (sec)	N/A	0.031	0.033	0.088	2.144	0.405	0.298	0.000	0.000

Problem 726	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	23	23	23	0	0	28	0	0	27
normalized size	1	1.00	1.00	0.00	0.00	1.22	0.00	0.00	1.17
time (sec)	N/A	0.048	0.087	0.166	0.000	0.410	0.000	0.000	3.415

Problem 727	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	66	66	41	51	74	35	54	35	50
normalized size	1	1.00	0.62	0.77	1.12	0.53	0.82	0.53	0.76
time (sec)	N/A	0.184	0.028	0.036	0.983	0.396	97.774	0.212	3.617

Problem 728	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	B	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	19	20	19	25	20	20	19
normalized size	1	1.00	1.58	1.67	1.58	2.08	1.67	1.67	1.58
time (sec)	N/A	0.013	0.006	0.039	0.918	0.407	0.116	0.213	0.064

Problem 729	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	12	12	0	11	8	54	11
normalized size	1	1.00	0.75	0.75	0.00	0.69	0.50	3.38	0.69
time (sec)	N/A	0.074	0.034	0.024	0.000	0.394	0.101	0.224	0.080

Problem 730	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	14	13	13	10	13	14
normalized size	1	1.00	1.00	0.88	0.81	0.81	0.62	0.81	0.88
time (sec)	N/A	0.058	0.035	0.026	1.090	0.372	0.094	0.214	3.482

Problem 731	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	33	33	33	23	74	33	0	33	-1
normalized size	1	1.00	1.00	0.70	2.24	1.00	0.00	1.00	-0.03
time (sec)	N/A	0.032	0.017	0.042	1.050	0.398	0.000	0.224	0.000

Problem 732	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F(-2)	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	11	11	11	9	8	0	8	8	8
normalized size	1	1.00	1.00	0.82	0.73	0.00	0.73	0.73	0.73
time (sec)	N/A	0.025	0.008	0.028	0.948	0.000	0.164	0.185	3.501

Problem 733	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	6	6	6	6	5	5	5	5	5
normalized size	1	1.00	1.00	1.00	0.83	0.83	0.83	0.83	0.83
time (sec)	N/A	0.020	0.029	0.023	0.997	0.395	0.092	0.208	0.035

Problem 734	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	17	19	18	14	0	21
normalized size	1	1.00	1.00	0.89	1.00	0.95	0.74	0.00	1.11
time (sec)	N/A	0.015	0.005	0.032	1.147	0.409	0.467	0.000	3.601

Problem 735	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	C	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	16	16	36	15	12	20	15
normalized size	1	1.00	0.84	0.84	1.89	0.79	0.63	1.05	0.79
time (sec)	N/A	0.100	0.014	0.026	0.739	0.395	0.092	0.213	0.073

Problem 736	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F(-2)	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	56	41	60	63	0	94	1415	62
normalized size	1	1.00	0.73	1.07	1.12	0.00	1.68	25.27	1.11
time (sec)	N/A	0.041	0.046	0.030	0.914	0.000	0.154	0.300	3.671

Problem 737	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	12	14	13	13	10	13	11
normalized size	1	1.00	0.80	0.93	0.87	0.87	0.67	0.87	0.73
time (sec)	N/A	0.009	0.002	0.027	0.487	0.393	0.096	0.210	3.500

Problem 738	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	14	12	12	11	10	11	11
normalized size	1	1.00	1.00	0.86	0.86	0.79	0.71	0.79	0.79
time (sec)	N/A	0.011	0.003	0.025	0.781	0.411	0.148	0.177	3.588

Problem 739	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	11	11	11	12	11	11	8	11	11
normalized size	1	1.00	1.00	1.09	1.00	1.00	0.73	1.00	1.00
time (sec)	N/A	0.011	0.002	0.026	0.987	0.405	0.104	0.182	3.499

Problem 740	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	20	21	20	17	17	20	17
normalized size	1	1.00	1.00	1.05	1.00	0.85	0.85	1.00	0.85
time (sec)	N/A	0.006	0.004	0.025	0.645	0.393	0.112	0.209	3.448

Problem 741	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	19	19	34	16	15	16	16
normalized size	1	1.00	0.59	0.59	1.06	0.50	0.47	0.50	0.50
time (sec)	N/A	0.044	0.021	0.025	0.532	0.386	0.095	0.212	0.050

Problem 742	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	33	33	33	28	27	40	36	27	26
normalized size	1	1.00	1.00	0.85	0.82	1.21	1.09	0.82	0.79
time (sec)	N/A	0.009	0.017	0.024	1.192	0.413	0.102	0.193	3.629

Problem 743	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	21	12	11	11	10	11	11
normalized size	1	1.00	1.00	0.57	0.52	0.52	0.48	0.52	0.52
time (sec)	N/A	0.011	0.003	0.025	1.083	0.403	0.147	0.182	3.494

Problem 744	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F(-2)	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	11	11	11	9	8	0	0	8	8
normalized size	1	1.00	1.00	0.82	0.73	0.00	0.00	0.73	0.73
time (sec)	N/A	0.041	0.005	0.053	1.311	0.000	0.000	0.227	3.447

Problem 745	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F(-2)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	10	16	0	0	0	9
normalized size	1	1.00	1.00	0.83	1.33	0.00	0.00	0.00	0.75
time (sec)	N/A	0.259	0.096	0.061	1.239	0.000	0.000	0.000	3.629

Problem 746	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F(-2)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	10	9	0	0	0	9
normalized size	1	1.00	1.00	0.83	0.75	0.00	0.00	0.00	0.75
time (sec)	N/A	0.130	0.046	0.050	1.158	0.000	0.000	0.000	3.353

Problem 747	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.183	0.159	0.045	0.000	0.000	0.000	0.000	0.000

Problem 748	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.117	0.074	0.044	0.000	0.000	0.000	0.000	0.000

Problem 749	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	52	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.081	0.102	0.041	0.000	0.000	0.000	0.000	0.000

Problem 750	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F(-2)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	20	16	23	0	0	0	15
normalized size	1	1.00	1.00	0.80	1.15	0.00	0.00	0.00	0.75
time (sec)	N/A	0.597	0.170	0.068	1.313	0.000	0.000	0.000	3.694

Problem 751	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	67	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.166	0.191	0.052	0.000	0.000	0.000	0.000	0.000

Problem 752	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F(-2)	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	9	8	0	12	8	8
normalized size	1	1.00	1.00	0.69	0.62	0.00	0.92	0.62	0.62
time (sec)	N/A	0.024	0.009	0.039	0.575	0.000	0.222	0.213	3.368

Problem 753	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F(-2)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	9	8	0	0	0	8
normalized size	1	1.00	1.00	0.69	0.62	0.00	0.00	0.00	0.62
time (sec)	N/A	0.066	0.005	0.056	1.202	0.000	0.000	0.000	3.379

Problem 754	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	38	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.040	0.050	0.030	0.000	0.000	0.000	0.000	0.000

Problem 755	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F(-2)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	10	16	0	0	0	9
normalized size	1	1.00	1.00	0.83	1.33	0.00	0.00	0.00	0.75
time (sec)	N/A	0.337	0.097	0.042	1.162	0.000	0.000	0.000	3.470

Problem 756	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F(-2)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	10	16	0	0	0	9
normalized size	1	1.00	1.00	0.83	1.33	0.00	0.00	0.00	0.75
time (sec)	N/A	0.144	0.051	0.057	1.506	0.000	0.000	0.000	3.639

Problem 757	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	31	23	24	27	22	28	22
normalized size	1	1.00	1.00	0.74	0.77	0.87	0.71	0.90	0.71
time (sec)	N/A	0.049	0.011	0.031	0.937	0.407	0.124	0.212	3.395

Problem 758	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	12	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.08
time (sec)	N/A	0.029	2.512	0.035	0.000	0.410	0.000	0.000	0.000

Problem 759	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	16	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.06
time (sec)	N/A	0.057	0.049	0.041	0.000	0.000	0.000	0.000	0.000

Problem 760	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	14	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.07
time (sec)	N/A	0.034	0.018	0.043	0.000	0.397	0.000	0.000	0.000

Problem 761	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	16	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.06
time (sec)	N/A	0.039	0.034	0.042	0.000	0.402	0.000	0.000	0.000

Problem 762	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	15	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.07
time (sec)	N/A	0.046	0.046	0.026	0.000	0.386	0.000	0.000	0.000

Problem 763	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	19	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.05
time (sec)	N/A	0.070	0.052	0.026	0.000	0.386	0.000	0.000	0.000

Problem 764	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	23	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.056	0.021	0.024	0.000	0.388	0.000	0.000	0.000

Problem 765	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.081	0.023	0.026	0.000	0.379	0.000	0.000	0.000

Problem 766	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	36	36	36	37	65	46	143	47	-1
normalized size	1	1.00	1.00	1.03	1.81	1.28	3.97	1.31	-0.03
time (sec)	N/A	0.099	0.046	0.027	0.877	0.413	43.309	0.733	0.000

Problem 767	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	37	37	37	241	36	0	0	0	-1
normalized size	1	1.00	1.00	6.51	0.97	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.035	0.018	0.152	0.990	0.426	0.000	0.000	0.000

Problem 768	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	50	50	50	0	50	0	0	0	-1
normalized size	1	1.00	1.00	0.00	1.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.044	0.026	0.260	1.248	0.411	0.000	0.000	0.000

Problem 769	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	F	C	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	37	37	37	0	38	0	105	0	58
normalized size	1	1.00	1.00	0.00	1.03	0.00	2.84	0.00	1.57
time (sec)	N/A	0.017	0.008	0.096	0.983	0.411	1.383	0.000	3.750

Problem 770	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	41	41	41	0	42	0	0	0	71
normalized size	1	1.00	1.00	0.00	1.02	0.00	0.00	0.00	1.73
time (sec)	N/A	0.016	0.009	0.152	1.011	0.402	0.000	0.000	3.782

Problem 771	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	52	52	52	0	0	0	0	0	77
normalized size	1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	1.48
time (sec)	N/A	0.026	0.015	0.215	0.000	0.410	0.000	0.000	3.895

Problem 772	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	56	56	0	0	0	0	0	94
normalized size	1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	1.68
time (sec)	N/A	0.025	0.014	0.251	0.000	0.408	0.000	0.000	4.007

Problem 773	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	74	0	0	89	0	0	-1
normalized size	1	1.00	0.92	0.00	0.00	1.11	0.00	0.00	-0.01
time (sec)	N/A	0.044	0.038	0.058	0.000	0.482	0.000	0.000	0.000

Problem 774	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	F(-2)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	0	21	0	0	0	14
normalized size	1	1.00	1.00	0.00	1.24	0.00	0.00	0.00	0.82
time (sec)	N/A	0.635	0.240	0.038	0.901	0.000	0.000	0.000	3.674

2.3 Detailed conclusion table specific for Rubi results

The following table is specific to Rubi. It gives additional statistics for each integral. the column **steps** is the number of steps used by Rubi to obtain the antiderivative. The **rules** column is the number of unique rules used. The **integrand size** column is the leaf size of the integrand. Finally the ratio $\frac{\text{number of rules}}{\text{integrand size}}$ is given. The larger this ratio is, the harder the integral was to solve. In this test, problem number [64] had the largest ratio of [.7368]

Table 2.1: Rubi specific breakdown of results for each integral

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
1	A	2	2	1.00	13	0.154
2	A	2	2	1.00	13	0.154
3	A	3	3	1.00	19	0.158
4	A	2	2	1.00	21	0.095
5	A	2	2	1.00	13	0.154
6	A	3	3	1.00	19	0.158
7	A	2	2	1.00	21	0.095
8	A	2	2	1.00	13	0.154
9	A	3	3	1.00	19	0.158
10	A	2	2	1.00	21	0.095

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
11	A	2	2	1.00	13	0.154
12	A	3	3	1.00	19	0.158
13	A	2	2	1.00	21	0.095
14	A	2	2	1.00	17	0.118
15	A	3	3	1.00	17	0.176
16	A	2	2	1.00	29	0.069
17	A	3	3	1.00	44	0.068
18	A	3	2	1.00	15	0.133
19	A	3	2	1.00	15	0.133
20	A	2	2	1.00	15	0.133
21	A	3	2	1.00	15	0.133
22	A	3	2	1.00	17	0.118
23	A	3	2	1.00	17	0.118
24	A	2	2	1.00	17	0.118
25	A	3	2	1.00	17	0.118
26	A	3	2	1.00	19	0.105
27	A	3	2	1.00	16	0.125
28	A	3	2	1.00	18	0.111
29	A	3	2	1.00	18	0.111
30	A	3	2	1.00	18	0.111
31	A	3	2	1.00	18	0.111
32	A	3	2	1.00	18	0.111
33	A	2	2	1.00	22	0.091
34	A	3	3	1.00	23	0.130
35	A	3	3	1.00	23	0.130
36	A	3	2	1.00	23	0.087

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
37	A	4	3	1.00	23	0.130
38	A	2	2	1.00	13	0.154
39	A	2	2	1.00	15	0.133
40	A	3	5	1.00	16	0.312
41	A	8	7	1.00	18	0.389
42	A	10	8	1.00	18	0.444
43	A	2	2	1.00	15	0.133
44	A	6	7	1.00	16	0.438
45	A	9	8	1.00	18	0.444
46	A	11	9	1.00	18	0.500
47	A	3	3	1.00	15	0.200
48	A	8	7	1.00	16	0.438
49	A	16	12	1.00	18	0.667
50	A	21	11	1.00	18	0.611
51	A	4	3	1.00	15	0.200
52	A	11	7	1.00	16	0.438
53	A	24	12	1.00	18	0.667
54	A	2	2	1.00	15	0.133
55	A	6	6	1.00	17	0.353
56	A	9	7	1.00	19	0.368
57	A	11	8	1.00	19	0.421
58	A	2	2	1.00	15	0.133
59	A	6	6	1.00	17	0.353
60	A	6	6	1.00	19	0.316
61	A	7	7	1.00	19	0.368
62	A	4	4	1.00	15	0.267

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
63	A	22	9	1.00	17	0.529
64	A	43	14	1.00	19	0.737
65	A	3	3	1.00	25	0.120
66	A	2	2	1.00	25	0.080
67	A	2	2	1.00	34	0.059
68	A	2	2	1.00	34	0.059
69	A	1	1	1.00	13	0.077
70	C	1	1	0.31	13	0.077
71	C	1	1	0.37	13	0.077
72	A	4	2	1.00	13	0.154
73	A	3	2	1.00	13	0.154
74	A	2	2	1.00	13	0.154
75	A	1	1	1.00	11	0.091
76	A	1	1	1.00	13	0.077
77	A	2	2	1.00	13	0.154
78	A	3	2	1.00	13	0.154
79	A	4	2	1.00	13	0.154
80	A	1	1	1.00	13	0.077
81	A	1	1	1.00	13	0.077
82	A	1	1	1.00	13	0.077
83	A	1	1	1.00	13	0.077
84	A	5	2	1.00	13	0.154
85	A	4	2	1.00	13	0.154
86	A	3	2	1.00	13	0.154
87	A	2	2	1.00	13	0.154
88	A	1	1	1.00	9	0.111

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
89	A	2	2	1.00	13	0.154
90	A	3	2	1.00	13	0.154
91	A	4	2	1.00	13	0.154
92	A	5	2	1.00	13	0.154
93	A	1	1	1.00	13	0.077
94	A	1	1	1.00	13	0.077
95	A	1	1	1.00	13	0.077
96	C	1	1	0.31	13	0.077
97	C	1	1	0.37	13	0.077
98	A	4	2	1.00	13	0.154
99	A	3	2	1.00	13	0.154
100	A	2	2	1.00	13	0.154
101	A	1	1	1.00	13	0.077
102	A	1	1	1.00	13	0.077
103	A	2	2	1.00	13	0.154
104	A	3	2	1.00	13	0.154
105	A	4	2	1.00	13	0.154
106	A	1	1	1.00	13	0.077
107	A	1	1	1.00	13	0.077
108	A	1	1	1.00	13	0.077
109	A	1	1	1.00	13	0.077
110	A	1	1	1.00	11	0.091
111	A	1	1	1.00	9	0.111
112	A	1	1	1.00	13	0.077
113	A	1	1	1.00	13	0.077
114	A	1	1	1.00	11	0.091

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
115	A	1	1	1.00	13	0.077
116	A	1	1	1.00	13	0.077
117	A	1	1	1.00	13	0.077
118	A	4	3	1.00	13	0.231
119	A	3	3	1.00	11	0.273
120	A	2	2	1.00	9	0.222
121	A	1	1	1.00	13	0.077
122	A	1	1	1.00	13	0.077
123	A	2	2	1.00	13	0.154
124	A	3	2	1.00	13	0.154
125	A	4	2	1.00	13	0.154
126	C	1	1	0.34	13	0.077
127	C	1	1	0.27	13	0.077
128	A	1	1	1.00	13	0.077
129	A	1	1	1.00	13	0.077
130	A	1	1	1.00	13	0.077
131	A	4	2	1.00	13	0.154
132	A	3	2	1.00	13	0.154
133	A	2	2	1.00	11	0.182
134	A	1	1	1.00	13	0.077
135	A	1	1	1.00	13	0.077
136	A	2	2	1.00	13	0.154
137	A	3	2	1.00	13	0.154
138	A	4	2	1.00	13	0.154
139	C	1	1	0.35	13	0.077
140	C	1	1	0.29	13	0.077

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
141	A	1	1	1.00	13	0.077
142	A	1	1	1.00	13	0.077
143	A	6	4	1.00	13	0.308
144	A	5	4	1.00	13	0.308
145	A	4	4	1.00	13	0.308
146	A	3	3	1.00	9	0.333
147	A	2	2	1.00	13	0.154
148	A	3	3	1.00	13	0.231
149	A	4	3	1.00	13	0.231
150	A	5	3	1.00	13	0.231
151	A	6	3	1.00	13	0.231
152	A	1	1	1.00	13	0.077
153	A	1	1	1.00	13	0.077
154	A	1	1	1.00	13	0.077
155	A	1	1	1.00	13	0.077
156	A	1	1	1.00	13	0.077
157	A	4	2	1.00	13	0.154
158	A	3	2	1.00	13	0.154
159	A	2	2	1.00	13	0.154
160	A	1	1	1.00	13	0.077
161	A	1	1	1.00	13	0.077
162	A	2	2	1.00	13	0.154
163	A	3	2	1.00	13	0.154
164	A	4	2	1.00	13	0.154
165	C	1	1	0.35	13	0.077
166	C	1	1	0.29	13	0.077

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
167	A	1	1	1.00	13	0.077
168	A	1	1	1.00	13	0.077
169	A	1	1	1.00	11	0.091
170	A	1	1	1.00	9	0.111
171	A	1	1	1.00	13	0.077
172	A	1	1	1.00	13	0.077
173	A	1	1	1.00	13	0.077
174	A	1	1	1.00	13	0.077
175	A	1	1	1.00	13	0.077
176	A	1	1	1.00	13	0.077
177	A	1	1	1.00	11	0.091
178	A	1	1	1.00	9	0.111
179	A	1	1	1.00	13	0.077
180	A	1	1	1.00	13	0.077
181	A	1	1	1.00	13	0.077
182	A	1	1	1.00	13	0.077
183	A	3	2	1.00	17	0.118
184	A	2	2	1.00	17	0.118
185	A	1	1	1.00	15	0.067
186	A	1	1	1.00	13	0.077
187	A	2	2	1.00	17	0.118
188	A	3	2	1.00	17	0.118
189	A	4	3	1.00	19	0.158
190	A	3	3	1.00	19	0.158
191	A	2	2	1.00	19	0.105
192	A	3	3	1.00	19	0.158

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
193	A	4	3	1.00	19	0.158
194	A	2	2	1.00	7	0.286
195	A	8	4	1.00	15	0.267
196	A	6	4	1.00	15	0.267
197	A	4	3	1.00	13	0.231
198	A	1	1	1.00	11	0.091
199	A	0	0	0.00	0	0.000
200	A	0	0	0.00	0	0.000
201	A	0	0	0.00	0	0.000
202	A	5	4	1.00	15	0.267
203	A	4	3	1.00	13	0.231
204	A	1	1	1.00	11	0.091
205	A	0	0	0.00	0	0.000
206	A	0	0	0.00	0	0.000
207	A	0	0	0.00	0	0.000
208	A	8	5	1.00	33	0.152
209	A	7	5	1.00	33	0.152
210	A	6	5	1.00	33	0.152
211	A	5	4	1.00	31	0.129
212	A	2	2	1.00	29	0.069
213	A	0	0	0.00	0	0.000
214	A	0	0	0.00	0	0.000
215	A	3	3	1.00	11	0.273
216	A	13	5	1.00	15	0.333
217	A	12	5	1.00	15	0.333
218	A	11	4	1.00	15	0.267

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
219	A	7	4	1.00	13	0.308
220	A	2	2	1.00	11	0.182
221	A	4	4	1.00	15	0.267
222	A	9	7	1.00	15	0.467
223	A	18	7	1.00	15	0.467
224	A	19	6	1.00	15	0.400
225	A	14	6	1.00	15	0.400
226	A	11	6	1.00	15	0.400
227	A	7	6	1.00	13	0.462
228	A	3	3	1.00	11	0.273
229	A	0	0	0.00	0	0.000
230	A	0	0	0.00	0	0.000
231	A	0	0	0.00	0	0.000
232	A	8	5	1.00	15	0.333
233	A	7	5	1.00	15	0.333
234	A	6	5	1.00	15	0.333
235	A	4	3	1.00	13	0.231
236	A	1	1	1.00	11	0.091
237	A	0	0	0.00	0	0.000
238	A	0	0	0.00	0	0.000
239	A	0	0	0.00	0	0.000
240	A	0	0	0.00	0	0.000
241	A	0	0	0.00	0	0.000
242	A	1	1	1.00	13	0.077
243	A	0	0	0.00	0	0.000
244	A	0	0	0.00	0	0.000

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
245	A	0	0	0.00	0	0.000
246	A	0	0	0.00	0	0.000
247	A	6	3	1.00	15	0.200
248	A	5	3	1.00	15	0.200
249	A	4	3	1.00	13	0.231
250	A	1	1	1.00	11	0.091
251	A	0	0	0.00	0	0.000
252	A	0	0	0.00	0	0.000
253	A	0	0	0.00	0	0.000
254	A	1	1	1.00	21	0.048
255	C	1	1	0.30	21	0.048
256	C	1	1	0.35	21	0.048
257	A	4	2	1.00	21	0.095
258	A	3	2	1.00	21	0.095
259	A	2	2	1.00	21	0.095
260	A	1	1	1.00	19	0.053
261	A	1	1	1.00	21	0.048
262	A	2	2	1.00	21	0.095
263	A	3	2	1.00	21	0.095
264	A	4	2	1.00	21	0.095
265	A	1	1	1.00	21	0.048
266	A	1	1	1.00	21	0.048
267	A	1	1	1.00	21	0.048
268	A	1	1	1.00	21	0.048
269	A	5	2	1.00	21	0.095
270	A	4	2	1.00	21	0.095

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
271	A	3	2	1.00	21	0.095
272	A	2	2	1.00	21	0.095
273	A	1	1	1.00	13	0.077
274	A	2	2	1.00	21	0.095
275	A	3	2	1.00	21	0.095
276	A	4	2	1.00	21	0.095
277	A	5	2	1.00	21	0.095
278	A	1	1	1.00	21	0.048
279	A	1	1	1.00	21	0.048
280	A	1	1	1.00	21	0.048
281	C	1	1	0.30	21	0.048
282	C	1	1	0.35	21	0.048
283	A	4	2	1.00	21	0.095
284	A	3	2	1.00	21	0.095
285	A	2	2	1.00	21	0.095
286	A	1	1	1.00	21	0.048
287	A	1	1	1.00	21	0.048
288	A	2	2	1.00	21	0.095
289	A	3	2	1.00	21	0.095
290	A	4	2	1.00	21	0.095
291	A	1	1	1.00	21	0.048
292	A	1	1	1.00	21	0.048
293	A	1	1	1.00	21	0.048
294	A	1	1	1.00	19	0.053
295	A	1	1	1.00	13	0.077
296	A	1	1	1.00	21	0.048

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
297	A	1	1	1.00	21	0.048
298	A	1	1	1.00	21	0.048
299	A	3	3	1.00	15	0.200
300	A	4	3	1.00	15	0.200
301	A	1	1	1.00	21	0.048
302	A	1	1	1.00	21	0.048
303	A	1	1	1.00	21	0.048
304	A	4	3	1.00	21	0.143
305	A	3	3	1.00	19	0.158
306	A	2	2	1.00	13	0.154
307	A	1	1	1.00	21	0.048
308	A	1	1	1.00	21	0.048
309	A	2	2	1.00	21	0.095
310	A	3	2	1.00	21	0.095
311	A	4	2	1.00	21	0.095
312	C	1	1	0.32	21	0.048
313	C	1	1	0.26	21	0.048
314	A	1	1	1.00	21	0.048
315	A	1	1	1.00	21	0.048
316	A	1	1	1.00	21	0.048
317	A	4	2	1.00	21	0.095
318	A	3	2	1.00	21	0.095
319	A	2	2	1.00	19	0.105
320	A	1	1	1.00	21	0.048
321	A	1	1	1.00	21	0.048
322	A	2	2	1.00	21	0.095

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
323	A	3	2	1.00	21	0.095
324	A	4	2	1.00	21	0.095
325	C	1	1	0.32	21	0.048
326	C	1	1	0.27	21	0.048
327	A	1	1	1.00	21	0.048
328	A	1	1	1.00	21	0.048
329	A	6	4	1.00	21	0.190
330	A	5	4	1.00	21	0.190
331	A	4	4	1.00	21	0.190
332	A	3	3	1.00	13	0.231
333	A	2	2	1.00	21	0.095
334	A	3	3	1.00	21	0.143
335	A	4	3	1.00	21	0.143
336	A	5	3	1.00	21	0.143
337	A	6	3	1.00	21	0.143
338	A	1	1	1.00	21	0.048
339	A	1	1	1.00	21	0.048
340	A	1	1	1.00	21	0.048
341	A	1	1	1.00	21	0.048
342	A	1	1	1.00	21	0.048
343	A	4	2	1.00	21	0.095
344	A	3	2	1.00	21	0.095
345	A	2	2	1.00	21	0.095
346	A	1	1	1.00	21	0.048
347	A	1	1	1.00	21	0.048
348	A	2	2	1.00	21	0.095

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
349	A	3	2	1.00	21	0.095
350	A	4	2	1.00	21	0.095
351	C	1	1	0.32	21	0.048
352	C	1	1	0.27	21	0.048
353	A	1	1	1.00	21	0.048
354	A	1	1	1.00	19	0.053
355	A	1	1	1.00	13	0.077
356	A	1	1	1.00	21	0.048
357	A	1	1	1.00	21	0.048
358	A	1	1	1.00	21	0.048
359	A	1	1	1.00	21	0.048
360	A	1	1	1.00	21	0.048
361	A	1	1	1.00	21	0.048
362	A	1	1	1.00	19	0.053
363	A	1	1	1.00	13	0.077
364	A	1	1	1.00	21	0.048
365	A	1	1	1.00	21	0.048
366	A	1	1	1.00	21	0.048
367	A	1	1	1.00	21	0.048
368	C	1	1	0.28	25	0.040
369	C	1	1	0.33	25	0.040
370	A	4	2	1.00	25	0.080
371	A	3	2	1.00	25	0.080
372	A	2	2	1.00	25	0.080
373	A	1	1	1.00	23	0.043
374	A	1	1	1.00	21	0.048

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
375	A	2	2	1.00	25	0.080
376	A	3	2	1.00	25	0.080
377	A	4	2	1.00	25	0.080
378	A	1	1	1.00	25	0.040
379	A	1	1	1.00	25	0.040
380	A	2	2	1.00	25	0.080
381	A	2	2	1.00	26	0.077
382	A	14	4	1.00	21	0.190
383	A	11	4	1.00	21	0.190
384	A	8	4	1.00	21	0.190
385	A	6	4	1.00	21	0.190
386	A	4	3	1.00	19	0.158
387	A	1	1	1.00	13	0.077
388	A	0	0	0.00	0	0.000
389	A	0	0	0.00	0	0.000
390	A	0	0	0.00	0	0.000
391	A	6	4	1.00	19	0.210
392	A	5	4	1.00	19	0.210
393	A	4	3	1.00	17	0.176
394	A	1	1	1.00	11	0.091
395	A	0	0	0.00	0	0.000
396	A	0	0	0.00	0	0.000
397	A	4	4	1.00	21	0.190
398	A	9	7	1.00	21	0.333
399	A	18	7	1.00	21	0.333
400	A	36	7	1.00	21	0.333

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
401	A	13	5	1.00	19	0.263
402	A	12	5	1.00	19	0.263
403	A	11	4	1.00	19	0.210
404	A	7	4	1.00	17	0.235
405	A	2	2	1.00	11	0.182
406	A	4	4	1.00	19	0.210
407	A	9	7	1.00	19	0.368
408	A	18	7	1.00	19	0.368
409	A	14	6	1.00	19	0.316
410	A	11	6	1.00	19	0.316
411	A	7	6	1.00	17	0.353
412	A	3	3	1.00	11	0.273
413	A	0	0	0.00	0	0.000
414	A	0	0	0.00	0	0.000
415	A	0	0	0.00	0	0.000
416	A	7	5	1.00	19	0.263
417	A	6	5	1.00	19	0.263
418	A	4	3	1.00	17	0.176
419	A	1	1	1.00	11	0.091
420	A	0	0	0.00	0	0.000
421	A	0	0	0.00	0	0.000
422	A	5	5	1.00	26	0.192
423	A	12	8	1.00	26	0.308
424	A	24	8	1.00	26	0.308
425	A	48	8	1.00	26	0.308
426	A	10	4	1.00	16	0.250

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
427	A	6	4	1.00	16	0.250
428	A	3	3	1.00	14	0.214
429	A	2	2	1.00	12	0.167
430	A	0	0	0.00	0	0.000
431	A	0	0	0.00	0	0.000
432	A	10	4	1.00	17	0.235
433	A	6	4	1.00	17	0.235
434	A	3	3	1.00	15	0.200
435	A	2	2	1.00	13	0.154
436	A	0	0	0.00	0	0.000
437	A	0	0	0.00	0	0.000
438	A	11	5	1.00	17	0.294
439	A	7	5	1.00	17	0.294
440	A	4	4	1.00	15	0.267
441	A	3	3	1.00	13	0.231
442	A	0	0	0.00	0	0.000
443	A	0	0	0.00	0	0.000
444	A	10	4	1.00	20	0.200
445	A	6	4	1.00	20	0.200
446	A	3	3	1.00	18	0.167
447	A	0	0	0.00	0	0.000
448	A	0	0	0.00	0	0.000
449	A	0	0	0.00	0	0.000
450	A	2	2	1.00	21	0.095
451	A	3	3	1.00	21	0.143
452	A	1	1	1.00	19	0.053

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
453	A	1	1	1.00	21	0.048
454	A	3	3	1.00	21	0.143
455	A	2	2	1.00	21	0.095
456	A	2	2	1.00	20	0.100
457	A	3	3	1.00	20	0.150
458	A	1	1	1.00	18	0.056
459	A	1	1	1.00	20	0.050
460	A	3	3	1.00	20	0.150
461	A	2	2	1.00	20	0.100
462	A	8	4	1.00	20	0.200
463	A	7	2	1.00	20	0.100
464	A	4	2	1.00	17	0.118
465	A	4	2	1.00	18	0.111
466	A	7	4	1.00	20	0.200
467	A	9	3	1.00	23	0.130
468	A	7	2	1.00	23	0.087
469	A	4	2	1.00	20	0.100
470	A	4	2	1.00	21	0.095
471	A	7	3	1.00	23	0.130
472	A	9	4	1.00	23	0.174
473	A	3	2	1.00	13	0.154
474	A	3	2	1.00	15	0.133
475	A	3	2	1.00	14	0.143
476	A	3	2	1.00	16	0.125
477	A	3	2	1.00	15	0.133
478	A	3	2	1.00	17	0.118

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
479	A	3	2	1.00	16	0.125
480	A	3	2	1.00	18	0.111
481	A	2	2	1.00	13	0.154
482	A	2	2	1.00	15	0.133
483	A	2	2	1.00	14	0.143
484	A	2	2	1.00	16	0.125
485	A	4	4	1.00	15	0.267
486	A	4	4	1.00	15	0.267
487	A	4	4	1.00	16	0.250
488	A	4	4	1.00	16	0.250
489	A	3	3	1.00	15	0.200
490	A	3	3	1.00	17	0.176
491	A	3	3	1.00	16	0.188
492	A	3	3	1.00	18	0.167
493	A	2	2	1.00	17	0.118
494	A	2	2	1.00	17	0.118
495	A	2	2	1.00	18	0.111
496	A	2	2	1.00	18	0.111
497	A	3	2	1.00	15	0.133
498	A	3	2	1.00	17	0.118
499	A	3	2	1.00	16	0.125
500	A	3	2	1.00	18	0.111
501	A	5	4	1.00	17	0.235
502	A	5	4	1.00	19	0.210
503	A	5	4	1.00	18	0.222
504	A	5	4	1.00	20	0.200

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
505	A	3	2	1.00	14	0.143
506	A	6	5	1.00	14	0.357
507	A	6	5	1.00	12	0.417
508	A	7	7	1.00	14	0.500
509	A	7	7	1.00	16	0.438
510	A	11	11	1.00	16	0.688
511	A	9	5	1.00	16	0.312
512	A	9	5	1.00	14	0.357
513	A	9	5	1.00	16	0.312
514	A	9	5	1.00	18	0.278
515	A	12	10	1.00	18	0.556
516	A	11	6	1.00	18	0.333
517	A	11	6	1.00	16	0.375
518	A	11	6	1.00	18	0.333
519	A	11	6	1.00	20	0.300
520	A	3	2	1.00	23	0.087
521	A	7	7	1.00	25	0.280
522	A	7	7	1.00	24	0.292
523	A	11	11	1.00	25	0.440
524	A	9	5	1.00	27	0.185
525	A	12	10	1.00	27	0.370
526	A	11	6	1.00	29	0.207
527	A	7	6	1.00	37	0.162
528	A	7	6	1.00	36	0.167
529	A	2	2	1.00	12	0.167
530	A	7	7	1.00	14	0.500

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
531	A	7	7	1.00	16	0.438
532	A	2	2	1.00	21	0.095
533	A	7	7	1.00	23	0.304
534	A	7	7	1.00	25	0.280
535	A	2	2	1.00	12	0.167
536	A	4	3	1.00	16	0.188
537	A	4	4	1.00	16	0.250
538	A	8	5	1.00	18	0.278
539	A	10	6	1.00	20	0.300
540	A	4	4	1.00	25	0.160
541	A	8	5	1.00	27	0.185
542	A	10	6	1.00	29	0.207
543	A	0	0	0.00	0	0.000
544	A	6	3	1.00	50	0.060
545	A	5	3	1.00	50	0.060
546	A	4	3	1.00	48	0.062
547	A	3	2	1.00	21	0.095
548	A	0	0	0.00	0	0.000
549	A	0	0	0.00	0	0.000
550	A	0	0	0.00	0	0.000
551	A	6	3	1.00	47	0.064
552	A	5	3	1.00	47	0.064
553	A	4	3	1.00	45	0.067
554	A	1	1	1.00	14	0.071
555	A	0	0	0.00	0	0.000
556	A	0	0	0.00	0	0.000

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
557	A	3	3	1.00	37	0.081
558	A	2	2	1.00	36	0.056
559	A	2	2	1.00	36	0.056
560	A	2	2	1.00	35	0.057
561	A	2	2	1.00	36	0.056
562	A	2	2	1.00	36	0.056
563	A	4	3	1.00	10	0.300
564	A	3	3	1.00	8	0.375
565	A	2	2	1.00	7	0.286
566	A	2	2	1.00	10	0.200
567	A	3	3	1.00	10	0.300
568	A	4	3	1.00	10	0.300
569	A	3	2	1.00	10	0.200
570	A	2	2	1.00	9	0.222
571	A	4	3	1.00	12	0.250
572	A	13	7	1.00	44	0.159
573	A	11	6	1.00	44	0.136
574	A	9	5	1.00	42	0.119
575	A	7	6	1.00	37	0.162
576	A	0	0	0.00	0	0.000
577	A	0	0	0.00	0	0.000
578	A	9	5	1.00	47	0.106
579	A	4	4	1.00	18	0.222
580	A	4	4	1.00	16	0.250
581	A	4	4	1.00	14	0.286
582	A	4	4	1.00	18	0.222

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
583	A	4	4	1.00	18	0.222
584	A	4	4	1.00	18	0.222
585	A	4	4	1.00	20	0.200
586	A	4	3	1.00	20	0.150
587	A	4	3	0.99	31	0.097
588	A	5	4	1.00	31	0.129
589	A	5	4	1.00	29	0.138
590	A	4	3	1.00	20	0.150
591	A	4	3	1.00	31	0.097
592	A	5	4	1.00	31	0.129
593	A	5	4	1.00	31	0.129
594	A	0	0	0.00	0	0.000
595	F	0	0	N/A	0	N/A
596	F	0	0	N/A	0	N/A
597	F	0	0	N/A	0	N/A
598	A	4	3	1.00	20	0.150
599	A	0	0	0.00	0	0.000
600	A	0	0	0.00	0	0.000
601	A	0	0	0.00	0	0.000
602	A	8	7	0.99	31	0.226
603	A	8	7	1.00	31	0.226
604	A	8	7	1.00	29	0.241
605	A	7	6	1.00	20	0.300
606	A	8	7	1.00	31	0.226
607	A	8	7	1.00	31	0.226

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
608	A	8	7	1.00	31	0.226
609	A	0	0	0.00	0	0.000
610	F	0	0	N/A	0	N/A
611	F	0	0	N/A	0	N/A
612	F	0	0	N/A	0	N/A
613	A	7	6	1.00	20	0.300
614	A	0	0	0.00	0	0.000
615	A	0	0	0.00	0	0.000
616	A	0	0	0.00	0	0.000
617	A	1	1	1.00	21	0.048
618	A	1	1	1.00	33	0.030
619	A	2	2	1.00	31	0.065
620	A	5	3	1.00	31	0.097
621	A	4	3	1.00	31	0.097
622	A	3	3	1.00	29	0.103
623	A	1	1	1.00	19	0.053
624	A	2	2	1.00	31	0.065
625	A	3	3	1.00	31	0.097
626	A	4	3	1.00	31	0.097
627	A	7	4	1.00	33	0.121
628	A	6	4	1.00	33	0.121
629	A	5	4	1.00	33	0.121
630	A	4	4	1.00	33	0.121
631	A	3	3	1.00	33	0.091
632	A	4	4	1.00	33	0.121

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
633	A	5	4	1.00	33	0.121
634	A	6	4	1.00	33	0.121
635	A	7	4	1.00	33	0.121
636	A	2	2	1.00	19	0.105
637	A	2	2	1.00	13	0.154
638	A	2	2	1.00	15	0.133
639	A	2	2	1.00	15	0.133
640	A	3	3	1.00	17	0.176
641	A	2	2	1.00	9	0.222
642	A	3	3	1.00	17	0.176
643	A	3	3	1.00	18	0.167
644	A	2	2	1.00	13	0.154
645	A	1	1	1.00	11	0.091
646	A	2	1	1.00	9	0.111
647	A	3	2	1.00	17	0.118
648	A	2	2	1.00	17	0.118
649	A	2	2	1.00	15	0.133
650	A	3	2	1.00	13	0.154
651	A	3	2	1.00	16	0.125
652	A	2	2	1.00	13	0.154
653	A	2	2	1.00	13	0.154
654	A	4	3	1.17	23	0.130
655	A	4	3	1.20	23	0.130
656	A	4	3	1.00	27	0.111
657	A	2	2	1.00	15	0.133
658	A	1	1	1.00	17	0.059

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
659	A	4	4	1.00	15	0.267
660	A	3	3	1.00	15	0.200
661	A	3	3	1.00	15	0.200
662	A	3	3	1.00	18	0.167
663	A	3	3	1.00	11	0.273
664	A	3	3	1.00	15	0.200
665	A	2	2	1.00	15	0.133
666	A	2	2	1.00	15	0.133
667	A	2	2	1.00	17	0.118
668	A	2	2	1.00	17	0.118
669	A	1	1	1.00	9	0.111
670	A	1	1	1.00	11	0.091
671	A	1	1	1.00	13	0.077
672	A	1	1	1.00	13	0.077
673	A	13	3	1.00	16	0.188
674	A	5	3	1.00	7	0.429
675	A	3	2	1.00	20	0.100
676	A	2	2	1.00	18	0.111
677	A	1	1	1.00	10	0.100
678	A	4	3	1.00	20	0.150
679	A	3	2	1.00	13	0.154
680	A	1	1	1.00	10	0.100
681	A	2	2	1.00	8	0.250
682	A	3	2	1.00	15	0.133
683	A	1	1	1.00	10	0.100
684	A	3	3	1.00	14	0.214

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
685	A	6	3	1.00	11	0.273
686	A	4	3	1.00	18	0.167
687	A	3	2	1.00	15	0.133
688	A	3	2	1.00	15	0.133
689	A	4	4	1.00	32	0.125
690	A	8	4	1.00	11	0.364
691	A	8	4	1.00	13	0.308
692	F	0	0	N/A	0	N/A
693	A	2	2	1.00	23	0.087
694	F	0	0	N/A	0	N/A
695	A	3	2	1.00	9	0.222
696	A	3	2	1.00	9	0.222
697	A	3	2	1.00	9	0.222
698	A	3	3	1.00	15	0.200
699	A	3	3	1.00	17	0.176
700	A	4	4	1.00	15	0.267
701	A	4	4	1.00	17	0.235
702	A	1	1	1.00	10	0.100
703	A	3	3	1.00	15	0.200
704	A	3	3	1.00	15	0.200
705	A	2	2	1.00	17	0.118
706	A	3	3	1.00	18	0.167
707	A	4	2	1.00	9	0.222
708	A	4	2	1.00	11	0.182
709	A	3	3	1.00	17	0.176

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
710	A	3	2	1.00	19	0.105
711	A	3	2	1.00	17	0.118
712	A	4	3	1.00	15	0.200
713	A	4	4	1.00	22	0.182
714	A	4	3	1.00	22	0.136
715	A	2	2	1.00	7	0.286
716	A	3	2	1.00	12	0.167
717	A	4	3	1.00	11	0.273
718	A	2	2	1.00	11	0.182
719	A	2	2	1.00	11	0.182
720	A	2	2	1.00	13	0.154
721	A	2	2	1.00	13	0.154
722	A	3	2	1.00	17	0.118
723	A	4	3	1.00	17	0.176
724	A	3	2	1.00	13	0.154
725	A	3	2	1.00	15	0.133
726	A	3	2	1.00	25	0.080
727	A	15	4	1.00	18	0.222
728	A	3	3	1.00	13	0.231
729	A	6	4	1.00	15	0.267
730	A	1	1	1.00	16	0.062
731	A	3	3	1.00	19	0.158
732	A	1	1	1.00	15	0.067
733	A	1	1	1.00	13	0.077
734	A	2	2	1.00	9	0.222
735	A	6	4	1.00	16	0.250

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
736	A	3	2	1.00	15	0.133
737	A	1	1	1.00	9	0.111
738	A	1	1	1.00	13	0.077
739	A	1	1	1.00	9	0.111
740	A	3	1	1.00	9	0.111
741	A	8	3	1.00	14	0.214
742	A	2	1	1.00	15	0.067
743	A	1	1	1.00	13	0.077
744	A	2	1	1.00	23	0.043
745	A	6	3	1.00	28	0.107
746	A	4	2	1.00	37	0.054
747	A	0	0	0.00	0	0.000
748	A	0	0	0.00	0	0.000
749	A	0	0	0.00	0	0.000
750	A	4	2	1.00	50	0.040
751	A	0	0	0.00	0	0.000
752	A	1	1	1.00	16	0.062
753	A	2	1	1.00	34	0.029
754	A	0	0	0.00	0	0.000
755	A	8	4	1.00	23	0.174
756	A	4	2	1.00	39	0.051
757	A	3	2	1.00	26	0.077
758	A	0	0	0.00	0	0.000
759	A	0	0	0.00	0	0.000
760	A	0	0	0.00	0	0.000
761	A	0	0	0.00	0	0.000

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
762	A	0	0	0.00	0	0.000
763	A	0	0	0.00	0	0.000
764	A	0	0	0.00	0	0.000
765	A	0	0	0.00	0	0.000
766	A	4	3	1.00	23	0.130
767	A	2	2	1.00	15	0.133
768	A	2	2	1.00	19	0.105
769	A	1	1	1.00	9	0.111
770	A	1	1	1.00	9	0.111
771	A	1	1	1.00	17	0.059
772	A	1	1	1.00	17	0.059
773	A	4	3	1.00	11	0.273
774	A	8	4	1.00	43	0.093

Chapter 3

Listing of integrals

3.1 $\int \frac{e^x}{4+6e^x}\,dx$

Optimal. Leaf size=12

$$\frac{1}{6}\log\left(3e^x+2\right)$$

```
[Out] 1/6*ln(2+3*exp(x))
```

Rubi [A] time = 0.02, antiderivative size = 12, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2246, 31}

$$\frac{1}{6}\log\left(3e^x+2\right)$$

Antiderivative was successfully verified.

```
[In] Int[E^x/(4 + 6*E^x),x]
```

```
[Out] Log[2 + 3*E^x]/6
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2246

```
Int[((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)*((a_) + (b_.)*((F_)^((e_.)*((
c_.) + (d_.)*(x_))))^(n_.))^(p_.), x_Symbol] :> Dist[1/(d*e*n*Log[F]), Subs
t[Int[(a + b*x)^p, x], x, (F^(e*(c + d*x)))^n], x] /; FreeQ[{F, a, b, c, d,
```

```
e, n, p}, x]
```

Rubi steps

$$\int \frac{e^x}{4+6e^x}\,dx = \text{Subst}\left(\int \frac{1}{4+6x}\,dx, x, e^x\right)$$
$$= \frac{1}{6}\log\left(2+3e^x\right)$$

Mathematica [A] time = 0.01, size = 12, normalized size = 1.00

$$\frac{1}{6}\log\left(3e^x+2\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x/(4 + 6*E^x),x]
[Out] Log[2 + 3*E^x]/6
```

fricas [A] time = 0.39, size = 9, normalized size = 0.75

$$\frac{1}{6}\log\left(3e^x+2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(4+6*exp(x)),x, algorithm="fricas")
[Out] 1/6*log(3*e^x + 2)
```

giac [A] time = 0.24, size = 9, normalized size = 0.75

$$\frac{1}{6}\log\left(3e^x+2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(4+6*exp(x)),x, algorithm="giac")
[Out] 1/6*log(3*e^x + 2)
```

maple [A] time = 0.00, size = 10, normalized size = 0.83

$$\frac{\ln\left(3\,\mathrm{e}^{x}+2\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(4+6*exp(x)),x)
[Out] 1/6*ln(2+3*exp(x))
```

maxima [A] time = 0.43, size = 9, normalized size = 0.75

$$\frac{1}{6}\log\left(3e^{x}+2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(4+6*exp(x)),x, algorithm="maxima")
[Out] 1/6*log(3*e^x + 2)
```

mupad [B] time = 0.05, size = 9, normalized size = 0.75

$$\frac{\ln\left(3\,\mathrm{e}^{x}+2\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(6*exp(x) + 4),x)
[Out] log(3*exp(x) + 2)/6
```

sympy [A] time = 0.09, size = 8, normalized size = 0.67

$$\frac{\log\left(e^{x}+\frac{2}{3}\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(4+6*exp(x)),x)
[Out] log(exp(x) + 2/3)/6
```

3.2 $\int \frac{e^x}{a+be^x} dx$

Optimal. Leaf size=12

$$\frac{\log(a+be^x)}{b}$$

```
[Out] ln(a+b*exp(x))/b
```

Rubi [A] time = 0.02, antiderivative size = 12, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2246, 31}

$$\frac{\log(a+be^x)}{b}$$

Antiderivative was successfully verified.

```
[In] Int[E^x/(a + b*E^x),x]
```

```
[Out] Log[a + b*E^x]/b
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x, x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2246

```
Int[((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)*((a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.))^(p_.), x_Symbol] :> Dist[1/(d*e*n*Log[F]), Subst[Int[(a + b*x)^p, x], x, (F^(e*(c + d*x)))^n], x] /; FreeQ[{F, a, b, c, d, e, n, p}, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{e^x}{a+be^x} dx &= \text{Subst}\left(\int \frac{1}{a+bx} dx, x, e^x\right)\\
&= \frac{\log(a+be^x)}{b}
\end{aligned}$$

Mathematica [A] time = 0.01, size = 12, normalized size = 1.00

$$\frac{\log(a+be^x)}{b}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x/(a + b*E^x),x]
```

```
[Out] Log[a + b*E^x]/b
```

fricas [A] time = 0.39, size = 11, normalized size = 0.92

$$\frac{\log\left(be^{x}+a\right)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(a+b*exp(x)),x, algorithm="fricas")
```

```
[Out] log(b*e^x + a)/b
```

giac [A] time = 0.35, size = 12, normalized size = 1.00

$$\frac{\log\left(|be^{x}+a|\right)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(a+b*exp(x)),x, algorithm="giac")
```

```
[Out] log(abs(b*e^x + a))/b
```

maple [A] time = 0.00, size = 12, normalized size = 1.00

$$\frac{\ln\left(b\,\mathrm{e}^{x}+a\right)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(b*exp(x)+a),x)
```

```
[Out] ln(b*exp(x)+a)/b
```

maxima [A] time = 0.42, size = 11, normalized size = 0.92

$$\frac{\log\left(be^{x}+a\right)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(a+b*exp(x)),x, algorithm="maxima")
```

```
[Out] log(b*e^x + a)/b
```

mupad [B] time = 0.06, size = 11, normalized size = 0.92

$$\frac{\ln\left(a+b\,\mathrm{e}^x\right)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(a + b*exp(x)),x)
```

```
[Out] log(a + b*exp(x))/b
```

sympy [A] time = 0.11, size = 8, normalized size = 0.67

$$\frac{\log\left(\frac{a}{b}+e^x\right)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(a+b*exp(x)),x)
```

```
[Out] log(a/b + exp(x))/b
```

3.3 $\int \frac{e^{dx}}{a+be^{c+dx}} dx$

Optimal. Leaf size=24

$$\frac{e^{-c} \log \left(a + be^{c+dx}\right)}{bd}$$

```
[Out] ln(a+b*exp(d*x+c))/b/d/exp(c)
```

Rubi [A] time = 0.07, antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {2247, 2246, 31}

$$\frac{e^{-c} \log \left(a + be^{c+dx}\right)}{bd}$$

Antiderivative was successfully verified.

```
[In] Int[E^(d*x)/(a + b*E^(c + d*x)),x]
```

```
[Out] Log[a + b*E^(c + d*x)]/(b*d*E^c)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2246

```
Int[((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)*((a_) + (b_.)*((F_)^((e_.)*((
c_.) + (d_.)*(x_))))^(n_.))^(p_.), x_Symbol] :> Dist[1/(d*e*n*Log[F]), Subs
t[Int[(a + b*x)^p, x], x, (F^(e*(c + d*x)))^n], x] /; FreeQ[{F, a, b, c, d,
 e, n, p}, x]
```

Rule 2247

```
Int[((a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.))^(p_.)*((G_)^((
h_.)*((f_.) + (g_.)*(x_))))^(m_.), x_Symbol] :> Dist[(G^(h*(f + g*x)))^m/(F
^(e*(c + d*x)))^n, Int[(F^(e*(c + d*x)))^n*(a + b*(F^(e*(c + d*x)))^n)^p, x
], x] /; FreeQ[{F, G, a, b, c, d, e, f, g, h, m, n, p}, x] && EqQ[d*e*n*Log
[F], g*h*m*Log[G]]
```

Rubi steps

$$\int \frac{e^{dx}}{a+be^{c+dx}}\,dx = e^{-c}\int \frac{e^{c+dx}}{a+be^{c+dx}}\,dx$$
$$= \frac{e^{-c}\,\mathrm{Subst}\left(\int \frac{1}{a+bx}\,dx, x, e^{c+dx}\right)}{d}$$
$$= \frac{e^{-c}\log\left(a+be^{c+dx}\right)}{bd}$$

Mathematica [A] time = 0.01, size = 24, normalized size = 1.00

$$\frac{e^{-c}\log\left(a+be^{c+dx}\right)}{bd}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(d*x)/(a + b*E^(c + d*x)),x]
[Out] Log[a + b*E^(c + d*x)]/(b*d*E^c)
```

fricas [A] time = 0.41, size = 22, normalized size = 0.92

$$\frac{e^{(-c)}\log\left(be^{(dx+c)}+a\right)}{bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(d*x)/(a+b*exp(d*x+c)),x, algorithm="fricas")
[Out] e^(-c)*log(b*e^(d*x + c) + a)/(b*d)
```

giac [A] time = 0.26, size = 23, normalized size = 0.96

$$\frac{e^{(-c)}\log\left(\left|be^{(dx+c)}+a\right|\right)}{bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(d*x)/(a+b*exp(d*x+c)),x, algorithm="giac")
[Out] e^(-c)*log(abs(b*e^(d*x + c) + a))/(b*d)
```

maple [A] time = 0.01, size = 23, normalized size = 0.96

$$\frac{\mathrm{e}^{-c}\ln\left(b\,\mathrm{e}^{c}\mathrm{e}^{dx}+a\right)}{bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(d*x)/(b*exp(d*x+c)+a),x)
```

```
[Out] 1/d*ln(b*exp(d*x)*exp(c)+a)/b/exp(c)
```

maxima [A] time = 0.44, size = 22, normalized size = 0.92

$$\frac{e^{(-c)} \log\left(be^{(dx+c)} + a\right)}{bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(d*x)/(a+b*exp(d*x+c)),x, algorithm="maxima")
```

```
[Out] e^(-c)*log(b*e^(d*x + c) + a)/(b*d)
```

mupad [B] time = 0.12, size = 22, normalized size = 0.92

$$\frac{\ln\left(a + b\,\mathrm{e}^{c+d\,x}\right)\,\mathrm{e}^{-c}}{b\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(d*x)/(a + b*exp(c + d*x)),x)
```

```
[Out] (log(a + b*exp(c + d*x))*exp(-c))/(b*d)
```

sympy [A] time = 0.16, size = 19, normalized size = 0.79

$$\frac{e^{-c} \log\left(\frac{ae^{-c}}{b} + e^{dx}\right)}{bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(d*x)/(a+b*exp(d*x+c)),x)
```

```
[Out] exp(-c)*log(a*exp(-c)/b + exp(d*x))/(b*d)
```

3.4 $\int \frac{e^{c+dx}}{a+be^{c+dx}} \, dx$

Optimal. Leaf size=19

$$\frac{\log \left(a+b e^{c+d x}\right)}{b d}$$

```
[Out] ln(a+b*exp(d*x+c))/b/d
```

Rubi [A] time = 0.04, antiderivative size = 19, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2246, 31}

$$\frac{\log \left(a+b e^{c+d x}\right)}{b d}$$

Antiderivative was successfully verified.

```
[In] Int[E^(c + d*x)/(a + b*E^(c + d*x)),x]
```

```
[Out] Log[a + b*E^(c + d*x)]/(b*d)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x, x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2246

```
Int[((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)*((a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.))^(p_.), x_Symbol] :> Dist[1/(d*e*n*Log[F]), Subst[Int[(a + b*x)^p, x], x, (F^(e*(c + d*x)))^n], x] /; FreeQ[{F, a, b, c, d, e, n, p}, x]
```

Rubi steps

$$\begin{aligned} \int \frac{e^{c+dx}}{a+be^{c+dx}} \, dx &= \frac{\text{Subst}\left(\int \frac{1}{a+bx} \, dx, x, e^{c+dx}\right)}{d} \\ &= \frac{\log \left(a+be^{c+dx}\right)}{bd} \end{aligned}$$

Mathematica [A] time = 0.01, size = 19, normalized size = 1.00

$$\frac{\log \left(a+b e^{c+d x}\right)}{b d}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(c + d*x)/(a + b*E^(c + d*x)),x]
```

```
[Out] Log[a + b*E^(c + d*x)]/(b*d)
```

fricas [A] time = 0.40, size = 18, normalized size = 0.95

$$\frac{\log\left(be^{(dx+c)} + a\right)}{bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(d*x+c)/(a+b*exp(d*x+c)),x, algorithm="fricas")
```

```
[Out] log(b*e^(d*x + c) + a)/(b*d)
```

giac [A] time = 0.34, size = 19, normalized size = 1.00

$$\frac{\log\left(\left|be^{(dx+c)} + a\right|\right)}{bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(d*x+c)/(a+b*exp(d*x+c)),x, algorithm="giac")
```

```
[Out] log(abs(b*e^(d*x + c) + a))/(b*d)
```

maple [A] time = 0.00, size = 19, normalized size = 1.00

$$\frac{\ln\left(b\,\mathrm{e}^{dx+c} + a\right)}{bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(d*x+c)/(b*exp(d*x+c)+a),x)
```

```
[Out] ln(b*exp(d*x+c)+a)/b/d
```

maxima [A] time = 0.43, size = 18, normalized size = 0.95

$$\frac{\log\left(be^{(dx+c)} + a\right)}{bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(d*x+c)/(a+b*exp(d*x+c)),x, algorithm="maxima")
```

```
[Out] log(b*e^(d*x + c) + a)/(b*d)
```

mupad [B] time = 0.05, size = 18, normalized size = 0.95

$$\frac{\ln\left(a+b\,\mathrm{e}^{c+d\,x}\right)}{b\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(c + d*x)/(a + b*exp(c + d*x)),x)
[Out] log(a + b*exp(c + d*x))/(b*d)
```

sympy [A] time = 0.13, size = 14, normalized size = 0.74

$$\frac{\log\left(\frac{a}{b}+e^{c+dx}\right)}{bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(d*x+c)/(a+b*exp(d*x+c)),x)
[Out] log(a/b + exp(c + d*x))/(b*d)
```

3.5 $\int e^x (a+be^x)^n \, dx$

Optimal. Leaf size=20

$$\frac{(a+be^x)^{n+1}}{b(n+1)}$$

```
[Out] (a+b*exp(x))^(1+n)/b/(1+n)
```

Rubi [A] time = 0.02, antiderivative size = 20, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2246, 32}

$$\frac{(a+be^x)^{n+1}}{b(n+1)}$$

Antiderivative was successfully verified.

```
[In] Int[E^x*(a + b*E^x)^n,x]
```

```
[Out] (a + b*E^x)^(1 + n)/(b*(1 + n))
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 2246

```
Int[((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)*((a_) + (b_.)*((F_)^((e_.)*((
c_.) + (d_.)*(x_))))^(n_.))^(p_.), x_Symbol] :> Dist[1/(d*e*n*Log[F]), Subs
t[Int[(a + b*x)^p, x], x, (F^(e*(c + d*x)))^n], x] /; FreeQ[{F, a, b, c, d,
 e, n, p}, x]
```

Rubi steps

$$\begin{aligned}\int e^x (a+be^x)^n \, dx &= \text{Subst}\left(\int (a+bx)^n \, dx, x, e^x\right)\\ &= \frac{(a+be^x)^{1+n}}{b(1+n)}\end{aligned}$$

Mathematica [A] time = 0.02, size = 19, normalized size = 0.95

$$\frac{(a+be^x)^{n+1}}{bn+b}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x*(a + b*E^x)^n,x]
```

```
[Out] (a + b*E^x)^(1 + n)/(b + b*n)
```

fricas [A] time = 0.42, size = 22, normalized size = 1.10

$$\frac{(be^x + a)(be^x + a)^n}{bn + b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(a+b*exp(x))^n,x, algorithm="fricas")
```

```
[Out] (b*e^x + a)*(b*e^x + a)^n/(b*n + b)
```

giac [A] time = 0.32, size = 19, normalized size = 0.95

$$\frac{(be^x + a)^{n+1}}{b(n+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(a+b*exp(x))^n,x, algorithm="giac")
```

```
[Out] (b*e^x + a)^(n + 1)/(b*(n + 1))
```

maple [A] time = 0.00, size = 20, normalized size = 1.00

$$\frac{(b\,\mathrm{e}^x + a)^{n+1}}{(n+1)\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*(b*exp(x)+a)^n,x)
```

```
[Out] (b*exp(x)+a)^(n+1)/b/(n+1)
```

maxima [A] time = 0.43, size = 19, normalized size = 0.95

$$\frac{(be^x + a)^{n+1}}{b(n+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(a+b*exp(x))^n,x, algorithm="maxima")
```

```
[Out] (b*e^x + a)^(n + 1)/(b*(n + 1))
```

mupad [B] time = 3.50, size = 19, normalized size = 0.95

$$\frac{(a+b\,\mathrm{e}^{x})^{n+1}}{b\,(n+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*(a + b*exp(x))^n,x)
[Out] (a + b*exp(x))^(n + 1)/(b*(n + 1))
```

sympy [A] time = 0.92, size = 56, normalized size = 2.80

$$\begin{cases} \frac{e^{x}}{a} & \text{for}\: b = 0 \wedge n = -1 \\ a^{n} e^{x} & \text{for}\: b = 0 \\ \frac{\log{\left(\frac{a}{b} + e^{x} \right)}}{b} & \text{for}\: n = -1 \\ \frac{a \left(a + b e^{x}\right)^{n}}{b n + b} + \frac{b \left(a + b e^{x}\right)^{n} e^{x}}{b n + b} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(a+b*exp(x))**n,x)
[Out] Piecewise((exp(x)/a, Eq(b, 0) & Eq(n, -1)), (a**n*exp(x), Eq(b, 0)), (log(a
/b + exp(x))/b, Eq(n, -1)), (a*(a + b*exp(x))**n/(b*n + b) + b*(a + b*exp(x
))**n*exp(x)/(b*n + b), True))
```

3.6 $\int e^{dx}\left(a+be^{c+dx}\right)^n\,dx$

Optimal. Leaf size=32

$$\frac{e^{-c}\left(a+be^{c+dx}\right)^{n+1}}{bd(n+1)}$$

```
[Out] (a+b*exp(d*x+c))^(1+n)/b/d/exp(c)/(1+n)
```

Rubi [A] time = 0.07, antiderivative size = 32, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {2247, 2246, 32}

$$\frac{e^{-c}\left(a+be^{c+dx}\right)^{n+1}}{bd(n+1)}$$

Antiderivative was successfully verified.

```
[In] Int[E^(d*x)*(a + b*E^(c + d*x))^n,x]
```

```
[Out] (a + b*E^(c + d*x))^(1 + n)/(b*d*E^c*(1 + n))
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 2246

```
Int[((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)*((a_) + (b_.)*((F_)^((e_.)*((
c_.) + (d_.)*(x_))))^(n_.))^(p_.), x_Symbol] :> Dist[1/(d*e*n*Log[F]), Subs
t[Int[(a + b*x)^p, x], x, (F^(e*(c + d*x)))^n], x] /; FreeQ[{F, a, b, c, d,
 e, n, p}, x]
```

Rule 2247

```
Int[((a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.))^(p_.)*((G_)^((
h_.)*((f_.) + (g_.)*(x_))))^(m_.), x_Symbol] :> Dist[(G^(h*(f + g*x)))^m/(F
^(e*(c + d*x)))^n, Int[(F^(e*(c + d*x)))^n*(a + b*(F^(e*(c + d*x)))^n)^p, x
], x] /; FreeQ[{F, G, a, b, c, d, e, f, g, h, m, n, p}, x] && EqQ[d*e*n*Log
[F], g*h*m*Log[G]]
```

Rubi steps

$$\int e^{dx}\left(a+be^{c+dx}\right)^n\,dx = e^{-c}\int e^{c+dx}\left(a+be^{c+dx}\right)^n\,dx$$
$$= \frac{e^{-c}\,\mathrm{Subst}\left(\int(a+bx)^n\,dx, x, e^{c+dx}\right)}{d}$$
$$= \frac{e^{-c}\left(a+be^{c+dx}\right)^{1+n}}{bd(1+n)}$$

Mathematica [A] time = 0.04, size = 31, normalized size = 0.97

$$\frac{e^{-c}\left(a+be^{c+dx}\right)^{n+1}}{bdn+bd}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(d*x)*(a + b*E^(c + d*x))^n,x]
[Out] (a + b*E^(c + d*x))^(1 + n)/(E^c*(b*d + b*d*n))
```

fricas [A] time = 0.43, size = 36, normalized size = 1.12

$$\frac{\left(be^{(dx)}+ae^{(-c)}\right)\left(be^{(dx+c)}+a\right)^n}{bdn+bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(d*x)*(a+b*exp(d*x+c))^n,x, algorithm="fricas")
[Out] (b*e^(d*x) + a*e^(-c))*(b*e^(d*x + c) + a)^n/(b*d*n + b*d)
```

giac [A] time = 0.39, size = 38, normalized size = 1.19

$$\frac{\left(be^{(dx+c)}+a\right)\left(be^{(dx+c)}+a\right)^n e^{(-c)}}{bd(n+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(d*x)*(a+b*exp(d*x+c))^n,x, algorithm="giac")
[Out] (b*e^(d*x + c) + a)*(b*e^(d*x + c) + a)^n*e^(-c)/(b*d*(n + 1))
```

maple [A] time = 0.01, size = 31, normalized size = 0.97

$$\frac{\left(b\,\mathrm{e}^{c}\mathrm{e}^{dx}+a\right)^{n+1}\mathrm{e}^{-c}}{(n+1)\,bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(d*x)*(b*exp(d*x+c)+a)^n,x)
```

```
[Out] 1/d*(b*exp(c)*exp(d*x)+a)^(n+1)/b/exp(c)/(n+1)
```

maxima [A] time = 0.44, size = 30, normalized size = 0.94

$$\frac{\left(be^{(dx+c)}+a\right)^{n+1}e^{(-c)}}{bd(n+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(d*x)*(a+b*exp(d*x+c))^n,x, algorithm="maxima")
```

```
[Out] (b*e^(d*x + c) + a)^(n + 1)*e^(-c)/(b*d*(n + 1))
```

mupad [B] time = 3.55, size = 44, normalized size = 1.38

$$\left(a+b\,\mathrm{e}^{c+d\,x}\right)^n\,\left(\frac{\mathrm{e}^{d\,x}}{d\,\left(n+1\right)}+\frac{a\,\mathrm{e}^{-c}}{b\,d\,\left(n+1\right)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(d*x)*(a + b*exp(c + d*x))^n,x)
```

```
[Out] (a + b*exp(c + d*x))^n*(exp(d*x)/(d*(n + 1)) + (a*exp(-c))/(b*d*(n + 1)))
```

sympy [A] time = 14.33, size = 114, normalized size = 3.56

$$\begin{cases} \frac{x}{a} & \text{for}\: b = 0 \wedge d = 0 \wedge n = -1 \\ \frac{a^{n} e^{dx}}{d} & \text{for}\: b = 0 \\ x \left(a + be^{c}\right)^{n} & \text{for}\: d = 0 \\ \frac{e^{-c} \log{\left(\frac{a}{b} + e^{c} e^{dx} \right)}}{bd} & \text{for}\: n = -1 \\ \frac{a \left(a + be^{c} e^{dx}\right)^{n}}{bdne^{c} + bde^{c}} + \frac{b \left(a + be^{c} e^{dx}\right)^{n} e^{c} e^{dx}}{bdne^{c} + bde^{c}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(d*x)*(a+b*exp(d*x+c))**n,x)
```

```
[Out] Piecewise((x/a, Eq(b, 0) & Eq(d, 0) & Eq(n, -1)), (a**n*exp(d*x)/d, Eq(b, 0
)), (x*(a + b*exp(c))**n, Eq(d, 0)), (exp(-c)*log(a/b + exp(c)*exp(d*x))/(b
```

```
*d), Eq(n, -1)), (a*(a + b*exp(c)*exp(d*x))**n/(b*d*n*exp(c) + b*d*exp(c))
+ b*(a + b*exp(c)*exp(d*x))**n*exp(c)*exp(d*x)/(b*d*n*exp(c) + b*d*exp(c)),
 True))
```

3.7 $\int e^{c+dx}\left(a+be^{c+dx}\right)^n\,dx$

Optimal. Leaf size=27

$$\frac{\left(a+be^{c+dx}\right)^{n+1}}{bd(n+1)}$$

```
[Out] (a+b*exp(d*x+c))^(1+n)/b/d/(1+n)
```

Rubi [A] time = 0.04, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2246, 32}

$$\frac{\left(a+be^{c+dx}\right)^{n+1}}{bd(n+1)}$$

Antiderivative was successfully verified.

```
[In] Int[E^(c + d*x)*(a + b*E^(c + d*x))^n,x]
```

```
[Out] (a + b*E^(c + d*x))^(1 + n)/(b*d*(1 + n))
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 2246

```
Int[((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)*((a_) + (b_.)*((F_)^((e_.)*((
c_.) + (d_.)*(x_))))^(n_.))^(p_.), x_Symbol] :> Dist[1/(d*e*n*Log[F]), Subs
t[Int[(a + b*x)^p, x], x, (F^(e*(c + d*x)))^n], x] /; FreeQ[{F, a, b, c, d,
 e, n, p}, x]
```

Rubi steps

$$\begin{aligned}\int e^{c+dx}\left(a+be^{c+dx}\right)^n\,dx&=\frac{\operatorname{Subst}\left(\int(a+bx)^n\,dx,x,e^{c+dx}\right)}{d}\\&=\frac{\left(a+be^{c+dx}\right)^{1+n}}{bd(1+n)}\end{aligned}$$

Mathematica [A] time = 0.03, size = 26, normalized size = 0.96

$$\frac{\left(a+be^{c+dx}\right)^{n+1}}{bdn+bd}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(c + d*x)*(a + b*E^(c + d*x))^n,x]
[Out] (a + b*E^(c + d*x))^(1 + n)/(b*d + b*d*n)
```

fricas [A] time = 0.43, size = 33, normalized size = 1.22

$$\frac{\left(be^{(dx+c)}+a\right)\left(be^{(dx+c)}+a\right)^{n}}{bdn+bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(d*x+c)*(a+b*exp(d*x+c))^n,x, algorithm="fricas")
[Out] (b*e^(d*x + c) + a)*(b*e^(d*x + c) + a)^n/(b*d*n + b*d)
```

giac [A] time = 0.34, size = 26, normalized size = 0.96

$$\frac{\left(be^{(dx+c)}+a\right)^{n+1}}{bd(n+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(d*x+c)*(a+b*exp(d*x+c))^n,x, algorithm="giac")
[Out] (b*e^(d*x + c) + a)^(n + 1)/(b*d*(n + 1))
```

maple [A] time = 0.00, size = 27, normalized size = 1.00

$$\frac{\left(b\,\mathrm{e}^{dx+c}+a\right)^{n+1}}{(n+1)\,bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(d*x+c)*(b*exp(d*x+c)+a)^n,x)
[Out] (b*exp(d*x+c)+a)^(n+1)/b/d/(n+1)
```

maxima [A] time = 0.43, size = 26, normalized size = 0.96

$$\frac{\left(be^{(dx+c)}+a\right)^{n+1}}{bd(n+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(d*x+c)*(a+b*exp(d*x+c))^n,x, algorithm="maxima")
```

```
[Out] (b*e^(d*x + c) + a)^(n + 1)/(b*d*(n + 1))
```

mupad [B] time = 3.48, size = 26, normalized size = 0.96

$$\frac{\left(a + b\,\mathrm{e}^{c+d\,x}\right)^{n+1}}{b\,d\,(n+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(c + d*x)*(a + b*exp(c + d*x))^n,x)
```

```
[Out] (a + b*exp(c + d*x))^(n + 1)/(b*d*(n + 1))
```

sympy [A] time = 18.74, size = 107, normalized size = 3.96

$$\begin{cases} \frac{xe^{c}}{a} & \text{for}\: b = 0 \wedge d = 0 \wedge n = -1 \\ \frac{a^{n} e^{c} e^{dx}}{d} & \text{for}\: b = 0 \\ x \left(a + be^{c}\right)^{n} e^{c} & \text{for}\: d = 0 \\ \frac{\log{\left(\frac{ae^{-c}}{b} + e^{dx} \right)}}{bd} & \text{for}\: n = -1 \\ \frac{a \left(a + be^{c} e^{dx}\right)^{n}}{bdn + bd} + \frac{b \left(a + be^{c} e^{dx}\right)^{n} e^{c} e^{dx}}{bdn + bd} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(d*x+c)*(a+b*exp(d*x+c))**n,x)
```

```
[Out] Piecewise((x*exp(c)/a, Eq(b, 0) & Eq(d, 0) & Eq(n, -1)), (a**n*exp(c)*exp(d
*x)/d, Eq(b, 0)), (x*(a + b*exp(c))**n*exp(c), Eq(d, 0)), (log(a*exp(-c)/b
+ exp(d*x))/(b*d), Eq(n, -1)), (a*(a + b*exp(c)*exp(d*x))**n/(b*d*n + b*d)
+ b*(a + b*exp(c)*exp(d*x))**n*exp(c)*exp(d*x)/(b*d*n + b*d), True))
```

3.8 $\int \frac{F^x}{a+bF^x} dx$

Optimal. Leaf size=16

$$\frac{\log\left(a+bF^x\right)}{b\log(F)}$$

[Out] ln(a+b*F^x)/b/ln(F)

Rubi [A] time = 0.02, antiderivative size = 16, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2246, 31}

$$\frac{\log\left(a+bF^x\right)}{b\log(F)}$$

Antiderivative was successfully verified.

[In] Int[F^x/(a + b*F^x),x]

[Out] Log[a + b*F^x]/(b*Log[F])

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2246

```
Int[((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)*((a_) + (b_.)*((F_)^((e_.)*((
c_.) + (d_.)*(x_))))^(n_.))^(p_.), x_Symbol] :> Dist[1/(d*e*n*Log[F]), Subs
t[Int[(a + b*x)^p, x], x, (F^(e*(c + d*x)))^n], x] /; FreeQ[{F, a, b, c, d,
 e, n, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{F^x}{a+bF^x}\,dx &= \frac{\operatorname{Subst}\left(\int \frac{1}{a+bx}\,dx,x,F^x\right)}{\log(F)}\\ &= \frac{\log\left(a+bF^x\right)}{b\log(F)}\end{aligned}$$

Mathematica [A] time = 0.01, size = 16, normalized size = 1.00

$$\frac{\log\left(a+bF^x\right)}{b\log(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^x/(a + b*F^x),x]
```

```
[Out] Log[a + b*F^x]/(b*Log[F])
```

fricas [A] time = 0.42, size = 16, normalized size = 1.00

$$\frac{\log\left(F^{x}b+a\right)}{b\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^x/(a+b*F^x),x, algorithm="fricas")
```

```
[Out] log(F^x*b + a)/(b*log(F))
```

giac [A] time = 0.29, size = 17, normalized size = 1.06

$$\frac{\log\left(|F^{x}b+a|\right)}{b\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^x/(a+b*F^x),x, algorithm="giac")
```

```
[Out] log(abs(F^x*b + a))/(b*log(F))
```

maple [A] time = 0.00, size = 17, normalized size = 1.06

$$\frac{\ln\left(b\,F^{x}+a\right)}{b\ln(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^x/(a+b*F^x),x)
```

```
[Out] ln(a+b*F^x)/b/ln(F)
```

maxima [A] time = 0.43, size = 16, normalized size = 1.00

$$\frac{\log\left(F^{x}b+a\right)}{b\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^x/(a+b*F^x),x, algorithm="maxima")
```

```
[Out] log(F^x*b + a)/(b*log(F))
```

mupad [B] time = 3.44, size = 16, normalized size = 1.00

$$\frac{\ln\left(a+F^x\,b\right)}{b\,\ln(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^x/(a + F^x*b),x)
[Out] log(a + F^x*b)/(b*log(F))
```

sympy [A] time = 0.12, size = 12, normalized size = 0.75

$$\frac{\log\left(F^x+\frac{a}{b}\right)}{b\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**x/(a+b*F**x),x)
[Out] log(F**x + a/b)/(b*log(F))
```

3.9 $\int \frac{F^{dx}}{a+bF^{c+dx}}\,dx$

Optimal. Leaf size=28

$$\frac{F^{-c}\log\left(a+bF^{c+dx}\right)}{bd\log(F)}$$

```
[Out] ln(a+b*F^(d*x+c))/b/d/(F^c)/ln(F)
```

Rubi [A] time = 0.07, antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {2247, 2246, 31}

$$\frac{F^{-c}\log\left(a+bF^{c+dx}\right)}{bd\log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(d*x)/(a + b*F^(c + d*x)),x]
```

```
[Out] Log[a + b*F^(c + d*x)]/(b*d*F^c*Log[F])
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2246

```
Int[((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)*((a_) + (b_.)*((F_)^((e_.)*((
c_.) + (d_.)*(x_))))^(n_.))^(p_.), x_Symbol] :> Dist[1/(d*e*n*Log[F]), Subs
t[Int[(a + b*x)^p, x], x, (F^(e*(c + d*x)))^n], x] /; FreeQ[{F, a, b, c, d,
 e, n, p}, x]
```

Rule 2247

```
Int[((a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.))^(p_.)*((G_)^((
h_.)*((f_.) + (g_.)*(x_))))^(m_.), x_Symbol] :> Dist[(G^(h*(f + g*x)))^m/(F
^(e*(c + d*x)))^n, Int[(F^(e*(c + d*x)))^n*(a + b*(F^(e*(c + d*x)))^n)^p, x
], x] /; FreeQ[{F, G, a, b, c, d, e, f, g, h, m, n, p}, x] && EqQ[d*e*n*Log
[F], g*h*m*Log[G]]
```

Rubi steps

$$\int \frac{F^{dx}}{a+bF^{c+dx}}\,dx = F^{-c}\int \frac{F^{c+dx}}{a+bF^{c+dx}}\,dx$$
$$= \frac{F^{-c}\,\mathrm{Subst}\left(\int \frac{1}{a+bx}\,dx, x, F^{c+dx}\right)}{d\log(F)}$$
$$= \frac{F^{-c}\log\left(a+bF^{c+dx}\right)}{bd\log(F)}$$

Mathematica [A] time = 0.01, size = 28, normalized size = 1.00

$$\frac{F^{-c}\log\left(a+bF^{c+dx}\right)}{bd\log(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(d*x)/(a + b*F^(c + d*x)),x]
[Out] Log[a + b*F^(c + d*x)]/(b*d*F^c*Log[F])
```

fricas [A] time = 0.41, size = 28, normalized size = 1.00

$$\frac{\log\left(F^{dx+c}b+a\right)}{F^{c}bd\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(d*x)/(a+b*F^(d*x+c)),x, algorithm="fricas")
[Out] log(F^(d*x + c)*b + a)/(F^c*b*d*log(F))
```

giac [A] time = 0.32, size = 30, normalized size = 1.07

$$\frac{\log\left(\left|F^{dx}F^{c}b+a\right|\right)}{F^{c}bd\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(d*x)/(a+b*F^(d*x+c)),x, algorithm="giac")
[Out] log(abs(F^(d*x)*F^c*b + a))/(F^c*b*d*log(F))
```

maple [A] time = 0.03, size = 33, normalized size = 1.18

$$\frac{F^{-c} \ln\left(b\,\mathrm{e}^{c\ln(F)}\mathrm{e}^{dx\ln(F)}+a\right)}{bd\ln(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(d*x)/(b*F^(d*x+c)+a),x)
[Out] 1/(F^c)/b/ln(F)/d*ln(a+b*exp(c*ln(F))*exp(d*ln(F)*x))
```

maxima [A] time = 0.43, size = 28, normalized size = 1.00

$$\frac{\log\left(F^{dx+c}b+a\right)}{F^{c}bd\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(d*x)/(a+b*F^(d*x+c)),x, algorithm="maxima")
[Out] log(F^(d*x + c)*b + a)/(F^c*b*d*log(F))
```

mupad [B] time = 3.58, size = 28, normalized size = 1.00

$$\frac{\ln\left(a+F^{c+d\,x}\,b\right)}{F^{c}\,b\,d\,\ln(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(d*x)/(a + F^(c + d*x)*b),x)
[Out] log(a + F^(c + d*x)*b)/(F^c*b*d*log(F))
```

sympy [A] time = 0.39, size = 24, normalized size = 0.86

$$\frac{e^{-c\log(F)}\log\left(F^{c+dx}+\frac{a}{b}\right)}{bd\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(d*x)/(a+b*F**(d*x+c)),x)
[Out] exp(-c*log(F))*log(F**(c + d*x) + a/b)/(b*d*log(F))
```

3.10 $\int \frac{F^{c+dx}}{a+bF^{c+dx}}\,dx$

Optimal. Leaf size=23

$$\frac{\log\left(a+bF^{c+dx}\right)}{bd\log(F)}$$

```
[Out] ln(a+b*F^(d*x+c))/b/d/ln(F)
```

Rubi [A] time = 0.04, antiderivative size = 23, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2246, 31}

$$\frac{\log\left(a+bF^{c+dx}\right)}{bd\log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(c + d*x)/(a + b*F^(c + d*x)),x]
```

```
[Out] Log[a + b*F^(c + d*x)]/(b*d*Log[F])
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2246

```
Int[((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)*((a_) + (b_.)*((F_)^((e_.)*((
c_.) + (d_.)*(x_))))^(n_.))^(p_.), x_Symbol] :> Dist[1/(d*e*n*Log[F]), Subs
t[Int[(a + b*x)^p, x], x, (F^(e*(c + d*x)))^n], x] /; FreeQ[{F, a, b, c, d,
 e, n, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{F^{c+dx}}{a+bF^{c+dx}}\,dx &= \frac{\text{Subst}\left(\int \frac{1}{a+bx}\,dx, x, F^{c+dx}\right)}{d\log(F)}\\ &= \frac{\log\left(a+bF^{c+dx}\right)}{bd\log(F)}\end{aligned}$$

Mathematica [A] time = 0.01, size = 23, normalized size = 1.00

$$\frac{\log\left(a+bF^{c+dx}\right)}{bd\log(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(c + d*x)/(a + b*F^(c + d*x)),x]
```

```
[Out] Log[a + b*F^(c + d*x)]/(b*d*Log[F])
```

fricas [A] time = 0.42, size = 23, normalized size = 1.00

$$\frac{\log\left(F^{dx+c}b+a\right)}{bd\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(d*x+c)/(a+b*F^(d*x+c)),x, algorithm="fricas")
```

```
[Out] log(F^(d*x + c)*b + a)/(b*d*log(F))
```

giac [A] time = 0.41, size = 24, normalized size = 1.04

$$\frac{\log\left(\left|F^{dx+c}b+a\right|\right)}{bd\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(d*x+c)/(a+b*F^(d*x+c)),x, algorithm="giac")
```

```
[Out] log(abs(F^(d*x + c)*b + a))/(b*d*log(F))
```

maple [A] time = 0.00, size = 24, normalized size = 1.04

$$\frac{\ln\left(b\,F^{dx+c}+a\right)}{bd\ln(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(d*x+c)/(b*F^(d*x+c)+a),x)
```

```
[Out] 1/b/d/ln(F)*ln(b*F^(d*x+c)+a)
```

maxima [A] time = 0.43, size = 23, normalized size = 1.00

$$\frac{\log\left(F^{dx+c}b+a\right)}{bd\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(d*x+c)/(a+b*F^(d*x+c)),x, algorithm="maxima")
```

```
[Out] log(F^(d*x + c)*b + a)/(b*d*log(F))
```

mupad [B] time = 0.00, size = 23, normalized size = 1.00

$$\frac{\ln\left(a + F^{c+d\,x}\,b\right)}{b\,d\,\ln(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(c + d*x)/(a + F^(c + d*x)*b),x)
```

```
[Out] log(a + F^(c + d*x)*b)/(b*d*log(F))
```

sympy [A] time = 0.14, size = 17, normalized size = 0.74

$$\frac{\log\left(F^{c+dx} + \frac{a}{b}\right)}{bd\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(d*x+c)/(a+b*F**(d*x+c)),x)
```

```
[Out] log(F**(c + d*x) + a/b)/(b*d*log(F))
```

3.11 $\int F^x (a+bF^x)^n \, dx$

Optimal. Leaf size=24

$$\frac{(a+bF^x)^{n+1}}{b(n+1)\log(F)}$$

[Out] (a+b*F^x)^(1+n)/b/(1+n)/ln(F)

Rubi [A] time = 0.02, antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2246, 32}

$$\frac{(a+bF^x)^{n+1}}{b(n+1)\log(F)}$$

Antiderivative was successfully verified.

[In] Int[F^x*(a + b*F^x)^n,x]

[Out] (a + b*F^x)^(1 + n)/(b*(1 + n)*Log[F])

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 2246

```
Int[((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)*((a_) + (b_.)*((F_)^((e_.)*((
c_.) + (d_.)*(x_))))^(n_.))^(p_.), x_Symbol] :> Dist[1/(d*e*n*Log[F]), Subs
t[Int[(a + b*x)^p, x], x, (F^(e*(c + d*x)))^n], x] /; FreeQ[{F, a, b, c, d,
 e, n, p}, x]
```

Rubi steps

$$\begin{aligned}\int F^x (a+bF^x)^n \, dx &= \frac{\text{Subst}\left(\int (a+bx)^n \, dx, x, F^x\right)}{\log(F)}\\ &= \frac{(a+bF^x)^{1+n}}{b(1+n)\log(F)}\end{aligned}$$

Mathematica [A] time = 0.02, size = 24, normalized size = 1.00

$$\frac{(a+bF^x)^{n+1}}{bn\log(F)+b\log(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^x*(a + b*F^x)^n,x]
[Out] (a + b*F^x)^(1 + n)/(b*Log[F] + b*n*Log[F])
```

fricas [A] time = 0.43, size = 28, normalized size = 1.17

$$\frac{(F^x b + a)(F^x b + a)^n}{(bn + b)\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^x*(a+b*F^x)^n,x, algorithm="fricas")
[Out] (F^x*b + a)*(F^x*b + a)^n/((b*n + b)*log(F))
```

giac [A] time = 0.43, size = 24, normalized size = 1.00

$$\frac{(F^x b + a)^{n+1}}{b(n+1)\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^x*(a+b*F^x)^n,x, algorithm="giac")
[Out] (F^x*b + a)^(n + 1)/(b*(n + 1)*log(F))
```

maple [A] time = 0.00, size = 25, normalized size = 1.04

$$\frac{(b F^x + a)^{n+1}}{(n+1) b \ln(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^x*(b*F^x+a)^n,x)
[Out] (b*F^x+a)^(n+1)/b/(n+1)/ln(F)
```

maxima [A] time = 0.43, size = 24, normalized size = 1.00

$$\frac{(F^x b + a)^{n+1}}{b(n+1)\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^x*(a+b*F^x)^n,x, algorithm="maxima")
```

```
[Out] (F^x*b + a)^(n + 1)/(b*(n + 1)*log(F))
```

mupad [B] time = 3.48, size = 24, normalized size = 1.00

$$\frac{(a + F^x\,b)^{n+1}}{b\,\ln(F)\,(n+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^x*(a + F^x*b)^n,x)
```

```
[Out] (a + F^x*b)^(n + 1)/(b*log(F)*(n + 1))
```

sympy [A] time = 1.26, size = 82, normalized size = 3.42

$$\begin{cases} \frac{x}{a} & \text{for } F = 1 \wedge b = 0 \wedge n = -1 \\ x\,(a+b)^n & \text{for } F = 1 \\ \frac{F^x a^n}{\log(F)} & \text{for } b = 0 \\ \frac{\log\left(F^x + \frac{a}{b}\right)}{b\log(F)} & \text{for } n = -1 \\ \frac{F^x b (F^x b + a)^n}{bn\log(F) + b\log(F)} + \frac{a (F^x b + a)^n}{bn\log(F) + b\log(F)} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**x*(a+b*F**x)**n,x)
```

```
[Out] Piecewise((x/a, Eq(F, 1) & Eq(b, 0) & Eq(n, -1)), (x*(a + b)**n, Eq(F, 1)),
 (F**x*a**n/log(F), Eq(b, 0)), (log(F**x + a/b)/(b*log(F)), Eq(n, -1)), (F*
*x*b*(F**x*b + a)**n/(b*n*log(F) + b*log(F)) + a*(F**x*b + a)**n/(b*n*log(F
) + b*log(F)), True))
```

3.12 $\int F^{dx} \left(a + bF^{c+dx}\right)^n \, dx$

Optimal. Leaf size=36

$$\frac{F^{-c} \left(a + bF^{c+dx}\right)^{n+1}}{bd(n+1)\log(F)}$$

```
[Out] (a+b*F^(d*x+c))^(1+n)/b/d/(F^c)/(1+n)/ln(F)
```

Rubi [A] time = 0.07, antiderivative size = 36, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {2247, 2246, 32}

$$\frac{F^{-c} \left(a + bF^{c+dx}\right)^{n+1}}{bd(n+1)\log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(d*x)*(a + b*F^(c + d*x))^n,x]
```

```
[Out] (a + b*F^(c + d*x))^(1 + n)/(b*d*F^c*(1 + n)*Log[F])
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 2246

```
Int[((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)*((a_) + (b_.)*((F_)^((e_.)*((
c_.) + (d_.)*(x_))))^(n_.))^(p_.), x_Symbol] :> Dist[1/(d*e*n*Log[F]), Subs
t[Int[(a + b*x)^p, x], x, (F^(e*(c + d*x)))^n], x] /; FreeQ[{F, a, b, c, d,
 e, n, p}, x]
```

Rule 2247

```
Int[((a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.))^(p_.)*((G_)^((
h_.)*((f_.) + (g_.)*(x_))))^(m_.), x_Symbol] :> Dist[(G^(h*(f + g*x)))^m/(F
^(e*(c + d*x)))^n, Int[(F^(e*(c + d*x)))^n*(a + b*(F^(e*(c + d*x)))^n)^p, x
], x] /; FreeQ[{F, G, a, b, c, d, e, f, g, h, m, n, p}, x] && EqQ[d*e*n*Log
[F], g*h*m*Log[G]]
```

Rubi steps

$$\int F^{dx}\left(a+bF^{c+dx}\right)^n\,dx = F^{-c}\int F^{c+dx}\left(a+bF^{c+dx}\right)^n\,dx$$
$$= \frac{F^{-c}\,\mathrm{Subst}\left(\int (a+bx)^n\,dx, x, F^{c+dx}\right)}{d\log(F)}$$
$$= \frac{F^{-c}\left(a+bF^{c+dx}\right)^{1+n}}{bd(1+n)\log(F)}$$

Mathematica [**A**] time = 0.04, size = 35, normalized size = 0.97

$$\frac{F^{-c}\left(a+bF^{c+dx}\right)^{n+1}}{bdn\log(F)+bd\log(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(d*x)*(a + b*F^(c + d*x))^n,x]
[Out] (a + b*F^(c + d*x))^(1 + n)/(F^c*(b*d*Log[F] + b*d*n*Log[F]))
```

fricas [**A**] time = 0.43, size = 50, normalized size = 1.39

$$\frac{\left(F^{dx+c}b+a\right)^n\left(\frac{F^{dx+c}b}{F^c}+\frac{a}{F^c}\right)}{(bdn+bd)\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(d*x)*(a+b*F^(d*x+c))^n,x, algorithm="fricas")
[Out] (F^(d*x + c)*b + a)^n*(F^(d*x + c)*b/F^c + a/F^c)/((b*d*n + b*d)*log(F))
```

giac [**A**] time = 0.44, size = 36, normalized size = 1.00

$$\frac{\left(F^{dx+c}b+a\right)^{n+1}}{F^c bd(n+1)\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(d*x)*(a+b*F^(d*x+c))^n,x, algorithm="giac")
[Out] (F^(d*x + c)*b + a)^(n + 1)/(F^c*b*d*(n + 1)*log(F))
```

maple [B] time = 0.04, size = 81, normalized size = 2.25

$$\frac{a\,F^{-c}\mathrm{e}^{n\ln\left(b\,\mathrm{e}^{c\ln(F)}\mathrm{e}^{dx\ln(F)}+a\right)}}{(n+1)\,bd\ln(F)}+\frac{\mathrm{e}^{n\ln\left(b\,\mathrm{e}^{c\ln(F)}\mathrm{e}^{dx\ln(F)}+a\right)}\mathrm{e}^{dx\ln(F)}}{(n+1)\,d\ln(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(d*x)*(b*F^(d*x+c)+a)^n,x)
```

```
[Out] 1/ln(F)/d/(n+1)*exp(d*x*ln(F))*exp(n*ln(b*exp(c*ln(F))*exp(d*x*ln(F))+a))+1
/(F^c)/ln(F)/b/d/(n+1)*a*exp(n*ln(b*exp(c*ln(F))*exp(d*x*ln(F))+a))
```

maxima [A] time = 0.44, size = 36, normalized size = 1.00

$$\frac{\left(F^{dx+c}b+a\right)^{n+1}}{F^{c}bd(n+1)\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(d*x)*(a+b*F^(d*x+c))^n,x, algorithm="maxima")
```

```
[Out] (F^(d*x + c)*b + a)^(n + 1)/(F^c*b*d*(n + 1)*log(F))
```

mupad [B] time = 3.53, size = 55, normalized size = 1.53

$$\left(a+F^{c+d\,x}\,b\right)^{n}\,\left(\frac{F^{d\,x}}{d\,\ln(F)\,\left(n+1\right)}+\frac{a}{F^{c}\,b\,d\,\ln(F)\,\left(n+1\right)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(d*x)*(a + F^(c + d*x)*b)^n,x)
```

```
[Out] (a + F^(c + d*x)*b)^n*(F^(d*x)/(d*log(F)*(n + 1)) + a/(F^c*b*d*log(F)*(n +
1)))
```

sympy [A] time = 145.67, size = 141, normalized size = 3.92

$$\begin{cases} \frac{x}{a} & \text{for } F = 1 \wedge b = 0 \wedge d = 0 \wedge n = -1 \\ x(a+b)^n & \text{for } F = 1 \\ \frac{F^{dx}a^n}{d\log(F)} & \text{for } b = 0 \\ x(F^c b + a)^n & \text{for } d = 0 \\ \frac{F^{-c}\log\left(F^c F^{dx} + \frac{a}{b}\right)}{bd\log(F)} & \text{for } n = -1 \\ \frac{F^c F^{dx} b\left(F^c F^{dx} b + a\right)^n}{F^c bdn\log(F) + F^c bd\log(F)} + \frac{a\left(F^c F^{dx} b + a\right)^n}{F^c bdn\log(F) + F^c bd\log(F)} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(d*x)*(a+b*F**(d*x+c))**n,x)
```

```
[Out] Piecewise((x/a, Eq(F, 1) & Eq(b, 0) & Eq(d, 0) & Eq(n, -1)), (x*(a + b)**n,
 Eq(F, 1)), (F**(d*x)*a**n/(d*log(F)), Eq(b, 0)), (x*(F**c*b + a)**n, Eq(d,
 0)), (F**(-c)*log(F**c*F**(d*x) + a/b)/(b*d*log(F)), Eq(n, -1)), (F**c*F**
(d*x)*b*(F**c*F**(d*x)*b + a)**n/(F**c*b*d*n*log(F) + F**c*b*d*log(F)) + a*
(F**c*F**(d*x)*b + a)**n/(F**c*b*d*n*log(F) + F**c*b*d*log(F)), True))
```

3.13 $\int F^{c+dx}\left(a+bF^{c+dx}\right)^n\,dx$

Optimal. Leaf size=31

$$\frac{\left(a+bF^{c+dx}\right)^{n+1}}{bd(n+1)\log(F)}$$

```
[Out] (a+b*F^(d*x+c))^(1+n)/b/d/(1+n)/ln(F)
```

Rubi [A] time = 0.04, antiderivative size = 31, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2246, 32}

$$\frac{\left(a+bF^{c+dx}\right)^{n+1}}{bd(n+1)\log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(c + d*x)*(a + b*F^(c + d*x))^n,x]
```

```
[Out] (a + b*F^(c + d*x))^(1 + n)/(b*d*(1 + n)*Log[F])
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m + 1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 2246

```
Int[((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)*((a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.))^(p_.), x_Symbol] :> Dist[1/(d*e*n*Log[F]), Subst[Int[(a + b*x)^p, x], x, (F^(e*(c + d*x)))^n], x] /; FreeQ[{F, a, b, c, d, e, n, p}, x]
```

Rubi steps

$$\begin{aligned}\int F^{c+dx}\left(a+bF^{c+dx}\right)^n\,dx &= \frac{\text{Subst}\left(\int(a+bx)^n\,dx,x,F^{c+dx}\right)}{d\log(F)}\\ &= \frac{\left(a+bF^{c+dx}\right)^{1+n}}{bd(1+n)\log(F)}\end{aligned}$$

Mathematica [A]   time = 0.03, size = 30, normalized size = 0.97

$$\frac{\left(a+bF^{c+dx}\right)^{n+1}}{bdn\log(F)+bd\log(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(c + d*x)*(a + b*F^(c + d*x))^n,x]
```

```
[Out] (a + b*F^(c + d*x))^(1 + n)/(b*d*Log[F] + b*d*n*Log[F])
```

fricas [A]   time = 0.43, size = 39, normalized size = 1.26

$$\frac{\left(F^{dx+c}b+a\right)\left(F^{dx+c}b+a\right)^{n}}{(bdn+bd)\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(d*x+c)*(a+b*F^(d*x+c))^n,x, algorithm="fricas")
```

```
[Out] (F^(d*x + c)*b + a)*(F^(d*x + c)*b + a)^n/((b*d*n + b*d)*log(F))
```

giac [A]   time = 0.44, size = 31, normalized size = 1.00

$$\frac{\left(F^{dx+c}b+a\right)^{n+1}}{bd(n+1)\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(d*x+c)*(a+b*F^(d*x+c))^n,x, algorithm="giac")
```

```
[Out] (F^(d*x + c)*b + a)^(n + 1)/(b*d*(n + 1)*log(F))
```

maple [A]   time = 0.00, size = 32, normalized size = 1.03

$$\frac{\left(b\,F^{dx+c}+a\right)^{n+1}}{(n+1)\,bd\ln(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(d*x+c)*(b*F^(d*x+c)+a)^n,x)
```

```
[Out] (b*F^(d*x+c)+a)^(n+1)/b/d/(n+1)/ln(F)
```

maxima [A] time = 0.44, size = 31, normalized size = 1.00

$$\frac{\left(F^{dx+c}b+a\right)^{n+1}}{bd(n+1)\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(d*x+c)*(a+b*F^(d*x+c))^n,x, algorithm="maxima")
```

```
[Out] (F^(d*x + c)*b + a)^(n + 1)/(b*d*(n + 1)*log(F))
```

mupad [B] time = 3.43, size = 52, normalized size = 1.68

$$\left(a+F^{c+d\,x}\,b\right)^n\,\left(\frac{F^{c+d\,x}}{d\,\ln(F)\,\left(n+1\right)}+\frac{a}{b\,d\,\ln(F)\,\left(n+1\right)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(c + d*x)*(a + F^(c + d*x)*b)^n,x)
```

```
[Out] (a + F^(c + d*x)*b)^n*(F^(c + d*x)/(d*log(F)*(n + 1)) + a/(b*d*log(F)*(n +
1)))
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(d*x+c)*(a+b*F**(d*x+c))**n,x)
```

```
[Out] Timed out
```

3.14 $\int (e^x)^n \left(a+b (e^x)^n\right)^p \, dx$

Optimal. Leaf size=25

$$\frac{\left(a+b (e^x)^n\right)^{p+1}}{bn(p+1)}$$

```
[Out] (a+b*exp(x)^n)^(1+p)/b/n/(1+p)
```

Rubi [A] time = 0.04, antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118, Rules used = {2246, 32}

$$\frac{\left(a+b (e^x)^n\right)^{p+1}}{bn(p+1)}$$

Antiderivative was successfully verified.

```
[In] Int[(E^x)^n*(a + b*(E^x)^n)^p,x]
```

```
[Out] (a + b*(E^x)^n)^(1 + p)/(b*n*(1 + p))
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 2246

```
Int[((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)*((a_) + (b_.)*((F_)^((e_.)*((
c_.) + (d_.)*(x_))))^(n_.))^(p_.), x_Symbol] :> Dist[1/(d*e*n*Log[F]), Subs
t[Int[(a + b*x)^p, x], x, (F^(e*(c + d*x)))^n], x] /; FreeQ[{F, a, b, c, d,
 e, n, p}, x]
```

Rubi steps

$$\begin{aligned}\int (e^x)^n \left(a+b (e^x)^n\right)^p \, dx &= \frac{\text{Subst}\left(\int (a+bx)^p \, dx, x, (e^x)^n\right)}{n}\\ &= \frac{\left(a+b (e^x)^n\right)^{1+p}}{bn(1+p)}\end{aligned}$$

Mathematica [A] time = 0.07, size = 24, normalized size = 0.96

$$\frac{\left(a+b\left(e^x\right)^n\right)^{p+1}}{bnp+bn}$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^x)^n*(a + b*(E^x)^n)^p,x]
[Out] (a + b*(E^x)^n)^(1 + p)/(b*n + b*n*p)
```

fricas [A] time = 0.43, size = 29, normalized size = 1.16

$$\frac{\left(be^{(nx)}+a\right)\left(be^{(nx)}+a\right)^p}{bnp+bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)^n*(a+b*exp(x)^n)^p,x, algorithm="fricas")
[Out] (b*e^(n*x) + a)*(b*e^(n*x) + a)^p/(b*n*p + b*n)
```

giac [A] time = 0.46, size = 24, normalized size = 0.96

$$\frac{\left(be^{(nx)}+a\right)^{p+1}}{bn\left(p+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)^n*(a+b*exp(x)^n)^p,x, algorithm="giac")
[Out] (b*e^(n*x) + a)^(p + 1)/(b*n*(p + 1))
```

maple [A] time = 0.00, size = 25, normalized size = 1.00

$$\frac{\left(b\left(e^x\right)^n+a\right)^{p+1}}{\left(p+1\right)bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)^n*(a+b*exp(x)^n)^p,x)
[Out] (a+b*exp(x)^n)^(p+1)/b/n/(p+1)
```

maxima [A] time = 0.44, size = 24, normalized size = 0.96

$$\frac{\left(be^{(nx)}+a\right)^{p+1}}{bn\left(p+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)^n*(a+b*exp(x)^n)^p,x, algorithm="maxima")
```

```
[Out] (b*e^(n*x) + a)^(p + 1)/(b*n*(p + 1))
```

mupad [B] time = 3.51, size = 24, normalized size = 0.96

$$\frac{\left(a+b\,\mathrm{e}^{n\,x}\right)^{p+1}}{b\,n\,\left(p+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)^n*(a + b*exp(x)^n)^p,x)
```

```
[Out] (a + b*exp(n*x))^(p + 1)/(b*n*(p + 1))
```

sympy [A] time = 2.38, size = 80, normalized size = 3.20

$$\begin{cases} \frac{x}{a} & \text{for}\ b=0 \wedge n=0 \wedge p=-1 \\ \frac{a^{p}\left(e^{x}\right)^{n}}{n} & \text{for}\ b=0 \\ x\left(a+b\right)^{p} & \text{for}\ n=0 \\ \frac{\log\left(\frac{a}{b}+\left(e^{x}\right)^{n}\right)}{bn} & \text{for}\ p=-1 \\ \frac{a\left(a+b\left(e^{x}\right)^{n}\right)^{p}}{bnp+bn}+\frac{b\left(a+b\left(e^{x}\right)^{n}\right)^{p}\left(e^{x}\right)^{n}}{bnp+bn} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)**n*(a+b*exp(x)**n)**p,x)
```

```
[Out] Piecewise((x/a, Eq(b, 0) & Eq(n, 0) & Eq(p, -1)), (a**p*exp(x)**n/n, Eq(b,
0)), (x*(a + b)**p, Eq(n, 0)), (log(a/b + exp(x)**n)/(b*n), Eq(p, -1)), (a*
(a + b*exp(x)**n)**p/(b*n*p + b*n) + b*(a + b*exp(x)**n)**p*exp(x)**n/(b*n*
p + b*n), True))
```

3.15 $\int e^{nx} \left(a+b \left(e^x\right)^n\right)^p \, dx$

Optimal. Leaf size=37

$$\frac{e^{nx} \left(e^x\right)^{-n} \left(a+b \left(e^x\right)^n\right)^{p+1}}{bn(p+1)}$$

```
[Out] exp(n*x)*(a+b*exp(x)^n)^(1+p)/b/(exp(x)^n)/n/(1+p)
```

Rubi [A] time = 0.06, antiderivative size = 37, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.176, Rules used = {2247, 2246, 32}

$$\frac{e^{nx} \left(e^x\right)^{-n} \left(a+b \left(e^x\right)^n\right)^{p+1}}{bn(p+1)}$$

Antiderivative was successfully verified.

```
[In] Int[E^(n*x)*(a + b*(E^x)^n)^p,x]
```

```
[Out] (E^(n*x)*(a + b*(E^x)^n)^(1 + p))/(b*(E^x)^n*n*(1 + p))
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 2246

```
Int[((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)*((a_) + (b_.)*((F_)^((e_.)*((
c_.) + (d_.)*(x_))))^(n_.))^(p_.), x_Symbol] :> Dist[1/(d*e*n*Log[F]), Subs
t[Int[(a + b*x)^p, x], x, (F^(e*(c + d*x)))^n], x] /; FreeQ[{F, a, b, c, d,
 e, n, p}, x]
```

Rule 2247

```
Int[((a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.))^(p_.)*((G_)^((
h_.)*((f_.) + (g_.)*(x_))))^(m_.), x_Symbol] :> Dist[(G^(h*(f + g*x)))^m/(F
^(e*(c + d*x)))^n, Int[(F^(e*(c + d*x)))^n*(a + b*(F^(e*(c + d*x)))^n)^p, x
], x] /; FreeQ[{F, G, a, b, c, d, e, f, g, h, m, n, p}, x] && EqQ[d*e*n*Log
[F], g*h*m*Log[G]]
```

Rubi steps

$$\int e^{nx}\left(a+b\left(e^x\right)^n\right)^p\,dx=\left(e^{nx}\left(e^x\right)^{-n}\right)\int \left(e^x\right)^n\left(a+b\left(e^x\right)^n\right)^p\,dx$$
$$=\frac{\left(e^{nx}\left(e^x\right)^{-n}\right)\text{Subst}\left(\int (a+bx)^p\,dx,x,\left(e^x\right)^n\right)}{n}$$
$$=\frac{e^{nx}\left(e^x\right)^{-n}\left(a+b\left(e^x\right)^n\right)^{1+p}}{bn(1+p)}$$

Mathematica [**A**] time = 0.04, size = 36, normalized size = 0.97

$$\frac{e^{nx}\left(e^x\right)^{-n}\left(a+b\left(e^x\right)^n\right)^{p+1}}{bnp+bn}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(n*x)*(a + b*(E^x)^n)^p,x]
[Out] (E^(n*x)*(a + b*(E^x)^n)^(1 + p))/((E^x)^n*(b*n + b*n*p))
```

fricas [**A**] time = 0.43, size = 29, normalized size = 0.78

$$\frac{\left(be^{(nx)}+a\right)\left(be^{(nx)}+a\right)^p}{bnp+bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(n*x)*(a+b*exp(x)^n)^p,x, algorithm="fricas")
[Out] (b*e^(n*x) + a)*(b*e^(n*x) + a)^p/(b*n*p + b*n)
```

giac [**A**] time = 0.41, size = 30, normalized size = 0.81

$$\frac{\left(be^{(nx)}+a\right)\left(be^{(nx)}+a\right)^p}{bn\left(p+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(n*x)*(a+b*exp(x)^n)^p,x, algorithm="giac")
[Out] (b*e^(n*x) + a)*(b*e^(n*x) + a)^p/(b*n*(p + 1))
```

maple [A] time = 0.03, size = 52, normalized size = 1.41

$$\frac{e^{nx} e^{p \ln(b\,e^{nx}+a)}}{\left(p+1\right) n}+\frac{a\,e^{p \ln(b\,e^{nx}+a)}}{\left(p+1\right) bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(n*x)*(b*exp(x)^n+a)^p,x)
```

```
[Out] 1/n/(p+1)*exp(n*x)*exp(p*ln(a+b*exp(n*x)))+a/b/n/(p+1)*exp(p*ln(a+b*exp(n*x
)))
```

maxima [A] time = 0.44, size = 24, normalized size = 0.65

$$\frac{\left(be^{(nx)}+a\right)^{p+1}}{bn\left(p+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(n*x)*(a+b*exp(x)^n)^p,x, algorithm="maxima")
```

```
[Out] (b*e^(n*x) + a)^(p + 1)/(b*n*(p + 1))
```

mupad [B] time = 3.44, size = 24, normalized size = 0.65

$$\frac{(a+b\,e^{n\,x})^{p+1}}{b\,n\,\left(p+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(n*x)*(a + b*exp(x)^n)^p,x)
```

```
[Out] (a + b*exp(n*x))^(p + 1)/(b*n*(p + 1))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(a+b\left(e^{x}\right)^{n}\right)^{p} e^{nx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(n*x)*(a+b*exp(x)**n)**p,x)
```

```
[Out] Integral((a + b*exp(x)**n)**p*exp(n*x), x)
```

3.16 $\int \left(F^{e(c+dx)}\right)^n \left(a+b\left(F^{e(c+dx)}\right)^n\right)^p\,dx$

Optimal. Leaf size=41

$$\frac{\left(a+b\left(F^{e(c+dx)}\right)^n\right)^{p+1}}{bden(p+1)\log(F)}$$

[Out] (a+b*(F^(e*(d*x+c)))^n)^(1+p)/b/d/e/n/(1+p)/ln(F)

Rubi [A] time = 0.06, antiderivative size = 41, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.069, Rules used = {2246, 32}

$$\frac{\left(a+b\left(F^{e(c+dx)}\right)^n\right)^{p+1}}{bden(p+1)\log(F)}$$

Antiderivative was successfully verified.

[In] Int[(F^(e*(c + d*x)))^n*(a + b*(F^(e*(c + d*x)))^n)^p,x]

[Out] (a + b*(F^(e*(c + d*x)))^n)^(1 + p)/(b*d*e*n*(1 + p)*Log[F])

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 2246

```
Int[((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)*((a_) + (b_.)*((F_)^((e_.)*((
c_.) + (d_.)*(x_))))^(n_.))^(p_.), x_Symbol] :> Dist[1/(d*e*n*Log[F]), Subs
t[Int[(a + b*x)^p, x], x, (F^(e*(c + d*x)))^n], x] /; FreeQ[{F, a, b, c, d,
 e, n, p}, x]
```

Rubi steps

$$\begin{aligned}\int \left(F^{e(c+dx)}\right)^n \left(a+b\left(F^{e(c+dx)}\right)^n\right)^p\,dx &= \frac{\text{Subst}\left(\int (a+bx)^p\,dx, x, \left(F^{e(c+dx)}\right)^n\right)}{den\log(F)}\\ &= \frac{\left(a+b\left(F^{e(c+dx)}\right)^n\right)^{1+p}}{bden(1+p)\log(F)}\end{aligned}$$

Mathematica [F] time = 0.31, size = 0, normalized size = 0.00

$$\int \left(F^{e(c+dx)}\right)^n \left(a+b\left(F^{e(c+dx)}\right)^n\right)^p \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(F^(e*(c + d*x)))^n*(a + b*(F^(e*(c + d*x)))^n)^p,x]
[Out] Integrate[(F^(e*(c + d*x)))^n*(a + b*(F^(e*(c + d*x)))^n)^p, x]
```

fricas [A] time = 0.43, size = 53, normalized size = 1.29

$$\frac{\left(F^{denx+cen}b+a\right)\left(F^{denx+cen}b+a\right)^p}{\left(bdenp+bden\right)\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((F^(e*(d*x+c)))^n*(a+b*(F^(e*(d*x+c)))^n)^p,x, algorithm="fricas"
)
[Out] (F^(d*e*n*x + c*e*n)*b + a)*(F^(d*e*n*x + c*e*n)*b + a)^p/((b*d*e*n*p + b*d
*e*n)*log(F))
```

giac [A] time = 0.50, size = 43, normalized size = 1.05

$$\frac{\left(F^{dnxe+cne}b+a\right)^{p+1}e^{(-1)}}{bdn\left(p+1\right)\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((F^(e*(d*x+c)))^n*(a+b*(F^(e*(d*x+c)))^n)^p,x, algorithm="giac")
[Out] (F^(d*n*x*e + c*n*e)*b + a)^(p + 1)*e^(-1)/(b*d*n*(p + 1)*log(F))
```

maple [A] time = 0.01, size = 42, normalized size = 1.02

$$\frac{\left(b\left(F^{(dx+c)e}\right)^n+a\right)^{p+1}}{\left(p+1\right)bden\ln(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((F^(e*(d*x+c)))^n*(a+b*(F^(e*(d*x+c)))^n)^p,x)
[Out] (a+b*(F^(e*(d*x+c)))^n)^(p+1)/b/d/e/n/(p+1)/ln(F)
```

maxima [A] time = 0.44, size = 41, normalized size = 1.00

$$\frac{\left(\left(F^{(dx+c)e}\right)^{n}b+a\right)^{p+1}}{bden\left(p+1\right)\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((F^(e*(d*x+c)))^n*(a+b*(F^(e*(d*x+c)))^n)^p,x, algorithm="maxima"
)
```

```
[Out] ((F^((d*x + c)*e))^n*b + a)^(p + 1)/(b*d*e*n*(p + 1)*log(F))
```

mupad [B] time = 3.51, size = 74, normalized size = 1.80

$$\left(\frac{\left(F^{c\,e+d\,e\,x}\right)^{n}}{d\,e\,n\,\ln\left(F\right)\,\left(p+1\right)}+\frac{a}{b\,d\,e\,n\,\ln\left(F\right)\,\left(p+1\right)}\right)\,\left(a+b\,\left(F^{c\,e+d\,e\,x}\right)^{n}\right)^{p}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((F^(e*(c + d*x)))^n*(a + b*(F^(e*(c + d*x)))^n)^p,x)
```

```
[Out] ((F^(c*e + d*e*x))^n/(d*e*n*log(F)*(p + 1)) + a/(b*d*e*n*log(F)*(p + 1)))*(
a + b*(F^(c*e + d*e*x))^n)^p
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((F**(e*(d*x+c)))**n*(a+b*(F**(e*(d*x+c)))**n)**p,x)
```

```
[Out] Timed out
```

3.17 $\int \left(a+b\left(F^{e(c+dx)}\right)^n\right)^p \left(G^{h(f+gx)}\right)^{\frac{den\log(F)}{gh\log(G)}} dx$

Optimal. Leaf size=80

$$\frac{\left(F^{e(c+dx)}\right)^{-n}\left(a+b\left(F^{e(c+dx)}\right)^n\right)^{p+1}\left(G^{h(f+gx)}\right)^{\frac{den\log(F)}{gh\log(G)}}}{bden(p+1)\log(F)}$$

```
[Out] (a+b*(F^(e*(d*x+c)))^n)^(1+p)*(G^(h*(g*x+f)))^(d*e*n*ln(F)/g/h/ln(G))/b/d/e
/((F^(e*(d*x+c)))^n)/n/(1+p)/ln(F)
```

Rubi [A] time = 0.13, antiderivative size = 80, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 44, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.068, Rules used = {2247, 2246, 32}

$$\frac{\left(F^{e(c+dx)}\right)^{-n}\left(a+b\left(F^{e(c+dx)}\right)^n\right)^{p+1}\left(G^{h(f+gx)}\right)^{\frac{den\log(F)}{gh\log(G)}}}{bden(p+1)\log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*(F^(e*(c + d*x)))^n)^p*(G^(h*(f + g*x)))^((d*e*n*Log[F])/(g*h*Lo
g[G])),x]
```

```
[Out] ((a + b*(F^(e*(c + d*x)))^n)^(1 + p)*(G^(h*(f + g*x)))^((d*e*n*Log[F])/(g*h
*Log[G])))/(b*d*e*(F^(e*(c + d*x)))^n*n*(1 + p)*Log[F])
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 2246

```
Int[((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)*((a_) + (b_.)*((F_)^((e_.)*((
c_.) + (d_.)*(x_))))^(n_.))^(p_.), x_Symbol] :> Dist[1/(d*e*n*Log[F]), Subs
t[Int[(a + b*x)^p, x], x, (F^(e*(c + d*x)))^n], x] /; FreeQ[{F, a, b, c, d,
 e, n, p}, x]
```

Rule 2247

```
Int[((a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.))^(p_.)*((G_)^((
h_.)*((f_.) + (g_.)*(x_))))^(m_.), x_Symbol] :> Dist[(G^(h*(f + g*x)))^m/(F
^(e*(c + d*x)))^n, Int[(F^(e*(c + d*x)))^n*(a + b*(F^(e*(c + d*x)))^n)^p, x
```

```
], x] /; FreeQ[{F, G, a, b, c, d, e, f, g, h, m, n, p}, x] && EqQ[d*e*n*Log
[F], g*h*m*Log[G]]
```

Rubi steps

$$\begin{aligned}\int \left(a+b\left(F^{e(c+dx)}\right)^n\right)^p\left(G^{h(f+gx)}\right)^{\frac{den\log(F)}{gh\log(G)}}\,dx &= \left(\left(F^{e(c+dx)}\right)^{-n}\left(G^{h(f+gx)}\right)^{\frac{den\log(F)}{gh\log(G)}}\right)\int\left(F^{e(c+dx)}\right)^n\left(a+b\left(F^{e(c+dx)}\right)^n\right)^p\,dx\\ &= \frac{\left(\left(F^{e(c+dx)}\right)^{-n}\left(G^{h(f+gx)}\right)^{\frac{den\log(F)}{gh\log(G)}}\right)\text{Subst}\left(\int(a+bx)^p\,dx,x,\left(F^{e(c+dx)}\right)^n\right)}{den\log(F)}\\ &= \frac{\left(F^{e(c+dx)}\right)^{-n}\left(a+b\left(F^{e(c+dx)}\right)^n\right)^{1+p}\left(G^{h(f+gx)}\right)^{\frac{den\log(F)}{gh\log(G)}}}{bden(1+p)\log(F)}\end{aligned}$$

Mathematica [F] time = 0.32, size = 0, normalized size = 0.00

$$\int\left(a+b\left(F^{e(c+dx)}\right)^n\right)^p\left(G^{h(f+gx)}\right)^{\frac{den\log(F)}{gh\log(G)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a + b*(F^(e*(c + d*x)))^n)^p*(G^(h*(f + g*x)))^((d*e*n*Log[F])/(
g*h*Log[G])),x]
```

```
[Out] Integrate[(a + b*(F^(e*(c + d*x)))^n)^p*(G^(h*(f + g*x)))^((d*e*n*Log[F])/(
g*h*Log[G])), x]
```

fricas [A] time = 0.45, size = 88, normalized size = 1.10

$$\frac{\left(F^{denx+cen}F^{\frac{(def-ceg)n}{g}}b+F^{\frac{(def-ceg)n}{g}}a\right)\left(F^{denx+cen}b+a\right)^p}{\left(bdenp+bden\right)\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*(F^(e*(d*x+c)))^n)^p*(G^(h*(g*x+f)))^(d*e*n*log(F)/g/h/log(G
)),x, algorithm="fricas")
```

```
[Out] (F^(d*e*n*x + c*e*n)*F^((d*e*f - c*e*g)*n/g)*b + F^((d*e*f - c*e*g)*n/g)*a)
*(F^(d*e*n*x + c*e*n)*b + a)^p/((b*d*e*n*p + b*d*e*n)*log(F))
```

giac [A] time = 1.93, size = 156, normalized size = 1.95

$$\frac{F^{\frac{dfne}{g}}be^{\left(2\,dnxe\log(F)+cne\log(F)+p\log\left(be^{\left(dnxe\log(F)+cne\log(F)\right)}+a\right)\right)}+F^{\frac{dfne}{g}}ae^{\left(dnxe\log(F)+p\log\left(be^{\left(dnxe\log(F)+cne\log(F)\right)}+a\right)\right)}}{bdnpe^{\left(dnxe\log(F)+cne\log(F)+1\right)}\log(F)+bdne^{\left(dnxe\log(F)+cne\log(F)+1\right)}\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*(F^(e*(d*x+c)))^n)^p*(G^(h*(g*x+f)))^(d*e*n*log(F)/g/h/log(G
)),x, algorithm="giac")
```

```
[Out] (F^(d*f*n*e/g)*b*e^(2*d*n*x*e*log(F) + c*n*e*log(F) + p*log(b*e^(d*n*x*e*lo
g(F) + c*n*e*log(F)) + a)) + F^(d*f*n*e/g)*a*e^(d*n*x*e*log(F) + p*log(b*e^
(d*n*x*e*log(F) + c*n*e*log(F)) + a)))/(b*d*n*p*e^(d*n*x*e*log(F) + c*n*e*l
og(F) + 1)*log(F) + b*d*n*e^(d*n*x*e*log(F) + c*n*e*log(F) + 1)*log(F))
```

maple [F] time = 0.74, size = 0, normalized size = 0.00

$$\int \left(G^{\left(gx+f\right)h}\right)^{\frac{den\ln(F)}{gh\ln(G)}}\left(b\left(F^{(dx+c)e}\right)^{n}+a\right)^{p}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*(F^((d*x+c)*e))^n+a)^p*(G^(h*(g*x+f)))^(d*e*n*ln(F)/g/h/ln(G)),x)
```

```
[Out] int((b*(F^((d*x+c)*e))^n+a)^p*(G^(h*(g*x+f)))^(d*e*n*ln(F)/g/h/ln(G)),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(\left(F^{(dx+c)e}\right)^{n}b+a\right)^{p}\left(G^{\left(gx+f\right)h}\right)^{\frac{den\log(F)}{gh\log(G)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*(F^(e*(d*x+c)))^n)^p*(G^(h*(g*x+f)))^(d*e*n*log(F)/g/h/log(G
)),x, algorithm="maxima")
```

```
[Out] integrate(((F^((d*x + c)*e))^n*b + a)^p*(G^((g*x + f)*h))^(d*e*n*log(F)/(g*
h*log(G))), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int {\left(G^{h\,\left(f+g\,x\right)}\right)}^{\frac{d\,e\,n\,\ln(F)}{g\,h\,\ln(G)}}\,{\left(a+b\,{\left(F^{e\,(c+d\,x)}\right)}^n\right)}^p\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((G^(h*(f + g*x)))^((d*e*n*log(F))/(g*h*log(G)))*(a + b*(F^(e*(c + d*x))
)^n)^p,x)
```

```
[Out] int((G^(h*(f + g*x)))^((d*e*n*log(F))/(g*h*log(G)))*(a + b*(F^(e*(c + d*x))
)^n)^p, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*(F**(e*(d*x+c)))**n)**p*(G**(h*(g*x+f)))**(d*e*n*ln(F)/g/h/l
n(G)),x)
```

```
[Out] Timed out
```

3.18 $\int \frac{e^{2x}}{a+be^x} dx$

Optimal. Leaf size=22

$$\frac{e^x}{b} - \frac{a\log(a + be^x)}{b^2}$$

[Out] exp(x)/b-a*ln(a+b*exp(x))/b^2

Rubi [A] time = 0.03, antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {2248, 43}

$$\frac{e^x}{b} - \frac{a\log(a + be^x)}{b^2}$$

Antiderivative was successfully verified.

[In] Int[E^(2*x)/(a + b*E^x),x]

[Out] E^x/b - (a*Log[a + b*E^x])/b^2

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2248

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(g*h*Log[G])/(d*e*Lo
g[F])]}, Dist[(Denominator[m]*G^(f*h - (c*g*h)/d))/(d*e*Log[F]), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^((e*(c + d*x))/De
nominator[m])], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$
\begin{aligned}
\int \frac{e^{2x}}{a+be^x}\,dx &= \text{Subst}\left(\int \frac{x}{a+bx}\,dx,x,e^x\right)\\
&= \text{Subst}\left(\int \left(\frac{1}{b}-\frac{a}{b(a+bx)}\right)dx,x,e^x\right)\\
&= \frac{e^x}{b}-\frac{a\log\left(a+be^x\right)}{b^2}
\end{aligned}
$$

Mathematica [A] time = 0.02, size = 22, normalized size = 1.00

$$\frac{e^x}{b}-\frac{a\log\left(a+be^x\right)}{b^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(2*x)/(a + b*E^x),x]
```

```
[Out] E^x/b - (a*Log[a + b*E^x])/b^2
```

fricas [A] time = 0.43, size = 19, normalized size = 0.86

$$\frac{be^x-a\log\left(be^x+a\right)}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(a+b*exp(x)),x, algorithm="fricas")
```

```
[Out] (b*e^x - a*log(b*e^x + a))/b^2
```

giac [A] time = 0.39, size = 21, normalized size = 0.95

$$\frac{e^x}{b}-\frac{a\log\left(|be^x+a|\right)}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(a+b*exp(x)),x, algorithm="giac")
```

```
[Out] e^x/b - a*log(abs(b*e^x + a))/b^2
```

maple [A] time = 0.01, size = 21, normalized size = 0.95

$$-\frac{a\ln\left(b\,\mathrm{e}^x+a\right)}{b^2}+\frac{\mathrm{e}^x}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(2*x)/(b*exp(x)+a),x)
```

```
[Out] exp(x)/b-a*ln(b*exp(x)+a)/b^2
```

maxima **[A]** time = 0.44, size = 20, normalized size = 0.91

$$\frac{e^x}{b} - \frac{a \log\left(be^x + a\right)}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(a+b*exp(x)),x, algorithm="maxima")
```

```
[Out] e^x/b - a*log(b*e^x + a)/b^2
```

mupad **[B]** time = 3.57, size = 20, normalized size = 0.91

$$-\frac{a \ln\left(a + b\,\mathrm{e}^x\right) - b\,\mathrm{e}^x}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(2*x)/(a + b*exp(x)),x)
```

```
[Out] -(a*log(a + b*exp(x)) - b*exp(x))/b^2
```

sympy **[A]** time = 0.13, size = 20, normalized size = 0.91

$$-\frac{a \log\left(\frac{a}{b} + e^x\right)}{b^2} + \begin{cases} \frac{e^x}{b} & \text{for}\ b \neq 0 \\ \frac{x}{b} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(a+b*exp(x)),x)
```

```
[Out] -a*log(a/b + exp(x))/b**2 + Piecewise((exp(x)/b, Ne(b, 0)), (x/b, True))
```

3.19 $\int \frac{e^{2x}}{(a+be^x)^2} dx$

Optimal. Leaf size=27

$$\frac{a}{b^2 (a + be^x)} + \frac{\log (a + be^x)}{b^2}$$

```
[Out] a/b^2/(a+b*exp(x))+ln(a+b*exp(x))/b^2
```

Rubi [A] time = 0.03, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {2248, 43}

$$\frac{a}{b^2 (a + be^x)} + \frac{\log (a + be^x)}{b^2}$$

Antiderivative was successfully verified.

```
[In] Int[E^(2*x)/(a + b*E^x)^2,x]
```

```
[Out] a/(b^2*(a + b*E^x)) + Log[a + b*E^x]/b^2
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2248

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(g*h*Log[G])/(d*e*Lo
g[F])]}, Dist[(Denominator[m]*G^(f*h - (c*g*h)/d))/(d*e*Log[F]), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^((e*(c + d*x))/De
nominator[m])], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int \frac{e^{2x}}{(a+be^x)^2}\,dx = \text{Subst}\left(\int \frac{x}{(a+bx)^2}\,dx, x, e^x\right)$$
$$= \text{Subst}\left(\int \left(-\frac{a}{b(a+bx)^2} + \frac{1}{b(a+bx)}\right) dx, x, e^x\right)$$
$$= \frac{a}{b^2\,(a+be^x)} + \frac{\log\,(a+be^x)}{b^2}$$

Mathematica [A] time = 0.02, size = 24, normalized size = 0.89

$$\frac{\frac{a}{a+be^x} + \log\,(a+be^x)}{b^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(2*x)/(a + b*E^x)^2,x]
[Out] (a/(a + b*E^x) + Log[a + b*E^x])/b^2
```

fricas [A] time = 0.42, size = 31, normalized size = 1.15

$$\frac{(be^x + a)\log\,(be^x + a) + a}{b^3e^x + ab^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(a+b*exp(x))^2,x, algorithm="fricas")
[Out] ((b*e^x + a)*log(b*e^x + a) + a)/(b^3*e^x + a*b^2)
```

giac [A] time = 0.37, size = 26, normalized size = 0.96

$$\frac{\log\,(|be^x + a|)}{b^2} + \frac{a}{(be^x + a)b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(a+b*exp(x))^2,x, algorithm="giac")
[Out] log(abs(b*e^x + a))/b^2 + a/((b*e^x + a)*b^2)
```

maple [A] time = 0.02, size = 26, normalized size = 0.96

$$\frac{a}{(b\,e^x + a)\,b^2} + \frac{\ln\,(b\,e^x + a)}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(2*x)/(b*exp(x)+a)^2,x)
```

```
[Out] a/b^2/(b*exp(x)+a)+ln(b*exp(x)+a)/b^2
```

maxima [A] time = 0.44, size = 28, normalized size = 1.04

$$\frac{a}{b^3e^x + ab^2} + \frac{\log\left(be^x + a\right)}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(a+b*exp(x))^2,x, algorithm="maxima")
```

```
[Out] a/(b^3*e^x + a*b^2) + log(b*e^x + a)/b^2
```

mupad [B] time = 3.61, size = 27, normalized size = 1.00

$$\frac{\ln\left(a + b\,\mathrm{e}^x\right)}{b^2} - \frac{\mathrm{e}^x}{b\,\left(a + b\,\mathrm{e}^x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(2*x)/(a + b*exp(x))^2,x)
```

```
[Out] log(a + b*exp(x))/b^2 - exp(x)/(b*(a + b*exp(x)))
```

sympy [A] time = 0.13, size = 24, normalized size = 0.89

$$\frac{a}{ab^2 + b^3e^x} + \frac{\log\left(\frac{a}{b} + e^x\right)}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(a+b*exp(x))**2,x)
```

```
[Out] a/(a*b**2 + b**3*exp(x)) + log(a/b + exp(x))/b**2
```

3.20 $\int \frac{e^{2x}}{(a+be^x)^3} \, dx$

Optimal. Leaf size=21

$$\frac{e^{2x}}{2a\,(a+be^x)^2}$$

[Out] 1/2*exp(2*x)/a/(a+b*exp(x))^2

Rubi [A] time = 0.02, antiderivative size = 21, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {2248, 37}

$$\frac{e^{2x}}{2a\,(a+be^x)^2}$$

Antiderivative was successfully verified.

[In] Int[E^(2*x)/(a + b*E^x)^3,x]

[Out] E^(2*x)/(2*a*(a + b*E^x)^2)

Rule 37

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp
[((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] /; FreeQ[{
a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -
1]
```

Rule 2248

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(g*h*Log[G])/(d*e*Lo
g[F])]}, Dist[(Denominator[m]*G^(f*h - (c*g*h)/d))/(d*e*Log[F]), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^((e*(c + d*x))/De
nominator[m])], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int \frac{e^{2x}}{(a+be^x)^3}\,dx = \text{Subst}\left(\int \frac{x}{(a+bx)^3}\,dx, x, e^x\right)$$
$$= \frac{e^{2x}}{2a\,(a+be^x)^2}$$

Mathematica [A] time = 0.01, size = 21, normalized size = 1.00

$$\frac{e^{2x}}{2a\,(a+be^x)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(2*x)/(a + b*E^x)^3,x]
```

```
[Out] E^(2*x)/(2*a*(a + b*E^x)^2)
```

fricas [B] time = 0.39, size = 35, normalized size = 1.67

$$-\frac{2\,be^x + a}{2\left(b^4 e^{(2\,x)} + 2\,ab^3 e^x + a^2 b^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(a+b*exp(x))^3,x, algorithm="fricas")
```

```
[Out] -1/2*(2*b*e^x + a)/(b^4*e^(2*x) + 2*a*b^3*e^x + a^2*b^2)
```

giac [A] time = 0.40, size = 20, normalized size = 0.95

$$-\frac{2\,be^x + a}{2\,(be^x + a)^2 b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(a+b*exp(x))^3,x, algorithm="giac")
```

```
[Out] -1/2*(2*b*e^x + a)/((b*e^x + a)^2*b^2)
```

maple [A] time = 0.02, size = 29, normalized size = 1.38

$$\frac{a}{2\,(b\,\mathrm{e}^x + a)^2\,b^2} - \frac{1}{(b\,\mathrm{e}^x + a)\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(2*x)/(b*exp(x)+a)^3,x)
```

```
[Out] -1/b^2/(b*exp(x)+a)+1/2*a/b^2/(b*exp(x)+a)^2
```

maxima [B] time = 0.48, size = 61, normalized size = 2.90

$$-\frac{be^{x}}{b^{4}e^{(2x)}+2\,ab^{3}e^{x}+a^{2}b^{2}}-\frac{a}{2\left(b^{4}e^{(2x)}+2\,ab^{3}e^{x}+a^{2}b^{2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(a+b*exp(x))^3,x, algorithm="maxima")
```

```
[Out] -b*e^x/(b^4*e^(2*x) + 2*a*b^3*e^x + a^2*b^2) - 1/2*a/(b^4*e^(2*x) + 2*a*b^3
*e^x + a^2*b^2)
```

mupad [B] time = 3.56, size = 29, normalized size = 1.38

$$\frac{\mathrm{e}^{2\,x}}{2\,a\,\left(a^{2}+2\,\mathrm{e}^{x}\,a\,b+\mathrm{e}^{2\,x}\,b^{2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(2*x)/(a + b*exp(x))^3,x)
```

```
[Out] exp(2*x)/(2*a*(b^2*exp(2*x) + a^2 + 2*a*b*exp(x)))
```

sympy [B] time = 0.13, size = 37, normalized size = 1.76

$$\frac{-a-2be^{x}}{2a^{2}b^{2}+4ab^{3}e^{x}+2b^{4}e^{2x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(a+b*exp(x))**3,x)
```

```
[Out] (-a - 2*b*exp(x))/(2*a**2*b**2 + 4*a*b**3*exp(x) + 2*b**4*exp(2*x))
```

3.21 $\int \frac{e^{2x}}{(a+be^x)^4}\,dx$

Optimal. Leaf size=34

$$\frac{a}{3b^2\,(a+be^x)^3}-\frac{1}{2b^2\,(a+be^x)^2}$$

[Out] 1/3*a/b^2/(a+b*exp(x))^3-1/2/b^2/(a+b*exp(x))^2

Rubi [A] time = 0.04, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {2248, 43}

$$\frac{a}{3b^2\,(a+be^x)^3}-\frac{1}{2b^2\,(a+be^x)^2}$$

Antiderivative was successfully verified.

[In] Int[E^(2*x)/(a + b*E^x)^4,x]

[Out] a/(3*b^2*(a + b*E^x)^3) - 1/(2*b^2*(a + b*E^x)^2)

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2248

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(g*h*Log[G])/(d*e*Lo
g[F])]}, Dist[(Denominator[m]*G^(f*h - (c*g*h)/d))/(d*e*Log[F]), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^((e*(c + d*x))/De
nominator[m])], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int \frac{e^{2x}}{(a+be^x)^4}\,dx = \text{Subst}\left(\int \frac{x}{(a+bx)^4}\,dx, x, e^x\right)$$
$$= \text{Subst}\left(\int \left(-\frac{a}{b(a+bx)^4} + \frac{1}{b(a+bx)^3}\right) dx, x, e^x\right)$$
$$= \frac{a}{3b^2\,(a+be^x)^3} - \frac{1}{2b^2\,(a+be^x)^2}$$

Mathematica [A] time = 0.02, size = 24, normalized size = 0.71

$$-\frac{a+3be^x}{6b^2\,(a+be^x)^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(2*x)/(a + b*E^x)^4,x]
```

```
[Out] -1/6*(a + 3*b*E^x)/(b^2*(a + b*E^x)^3)
```

fricas [A] time = 0.42, size = 47, normalized size = 1.38

$$-\frac{3\,be^x + a}{6\left(b^5e^{(3\,x)} + 3\,ab^4e^{(2\,x)} + 3\,a^2b^3e^x + a^3b^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(a+b*exp(x))^4,x, algorithm="fricas")
```

```
[Out] -1/6*(3*b*e^x + a)/(b^5*e^(3*x) + 3*a*b^4*e^(2*x) + 3*a^2*b^3*e^x + a^3*b^2
)
```

giac [A] time = 0.38, size = 20, normalized size = 0.59

$$-\frac{3\,be^x + a}{6\,(be^x + a)^3b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(a+b*exp(x))^4,x, algorithm="giac")
```

```
[Out] -1/6*(3*b*e^x + a)/((b*e^x + a)^3*b^2)
```

maple [A] time = 0.02, size = 29, normalized size = 0.85

$$\frac{a}{3\,(b\,e^x + a)^3\,b^2} - \frac{1}{2\,(b\,e^x + a)^2\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(2*x)/(b*exp(x)+a)^4,x)
```

```
[Out] 1/3*a/b^2/(b*exp(x)+a)^3-1/2/b^2/(b*exp(x)+a)^2
```

maxima [B] time = 0.46, size = 85, normalized size = 2.50

$$-\frac{be^{x}}{2\left(b^{5}e^{(3x)}+3\,ab^{4}e^{(2x)}+3\,a^{2}b^{3}e^{x}+a^{3}b^{2}\right)}-\frac{a}{6\left(b^{5}e^{(3x)}+3\,ab^{4}e^{(2x)}+3\,a^{2}b^{3}e^{x}+a^{3}b^{2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(a+b*exp(x))^4,x, algorithm="maxima")
```

```
[Out] -1/2*b*e^x/(b^5*e^(3*x) + 3*a*b^4*e^(2*x) + 3*a^2*b^3*e^x + a^3*b^2) - 1/6*
a/(b^5*e^(3*x) + 3*a*b^4*e^(2*x) + 3*a^2*b^3*e^x + a^3*b^2)
```

mupad [B] time = 3.60, size = 53, normalized size = 1.56

$$\frac{\frac{e^{2\,x}}{2\,a}+\frac{b\,e^{3\,x}}{6\,a^{2}}}{a^{3}+3\,e^{x}\,a^{2}\,b+3\,e^{2\,x}\,a\,b^{2}+e^{3\,x}\,b^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(2*x)/(a + b*exp(x))^4,x)
```

```
[Out] (exp(2*x)/(2*a) + (b*exp(3*x))/(6*a^2))/(b^3*exp(3*x) + a^3 + 3*a^2*b*exp(x
) + 3*a*b^2*exp(2*x))
```

sympy [A] time = 0.16, size = 51, normalized size = 1.50

$$\frac{-a-3be^{x}}{6a^{3}b^{2}+18a^{2}b^{3}e^{x}+18ab^{4}e^{2x}+6b^{5}e^{3x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(a+b*exp(x))**4,x)
```

```
[Out] (-a - 3*b*exp(x))/(6*a**3*b**2 + 18*a**2*b**3*exp(x) + 18*a*b**4*exp(2*x) +
 6*b**5*exp(3*x))
```

3.22 $\int \frac{e^{4x}}{a+be^{2x}}\,dx$

Optimal. Leaf size=31

$$\frac{e^{2x}}{2b} - \frac{a\log\left(a+be^{2x}\right)}{2b^2}$$

```
[Out] 1/2*exp(2*x)/b-1/2*a*ln(a+b*exp(2*x))/b^2
```

Rubi [A] time = 0.03, antiderivative size = 31, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118, Rules used = {2248, 43}

$$\frac{e^{2x}}{2b} - \frac{a\log\left(a+be^{2x}\right)}{2b^2}$$

Antiderivative was successfully verified.

```
[In] Int[E^(4*x)/(a + b*E^(2*x)),x]
```

```
[Out] E^(2*x)/(2*b) - (a*Log[a + b*E^(2*x)])/(2*b^2)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2248

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(g*h*Log[G])/(d*e*Lo
g[F])]}, Dist[(Denominator[m]*G^(f*h - (c*g*h)/d))/(d*e*Log[F]), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^((e*(c + d*x))/De
nominator[m])], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int \frac{e^{4x}}{a+be^{2x}}\,dx = \frac{1}{2}\operatorname{Subst}\left(\int \frac{x}{a+bx}\,dx, x, e^{2x}\right)$$
$$= \frac{1}{2}\operatorname{Subst}\left(\int \left(\frac{1}{b}-\frac{a}{b(a+bx)}\right)dx, x, e^{2x}\right)$$
$$= \frac{e^{2x}}{2b}-\frac{a\log\left(a+be^{2x}\right)}{2b^2}$$

Mathematica [A] time = 0.02, size = 30, normalized size = 0.97

$$\frac{1}{2}\left(\frac{e^{2x}}{b}-\frac{a\log\left(a+be^{2x}\right)}{b^2}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(4*x)/(a + b*E^(2*x)),x]
[Out] (E^(2*x)/b - (a*Log[a + b*E^(2*x)])/b^2)/2
```

fricas [A] time = 0.41, size = 24, normalized size = 0.77

$$\frac{be^{(2x)}-a\log\left(be^{(2x)}+a\right)}{2b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x)/(a+b*exp(2*x)),x, algorithm="fricas")
[Out] 1/2*(b*e^(2*x) - a*log(b*e^(2*x) + a))/b^2
```

giac [A] time = 0.24, size = 26, normalized size = 0.84

$$\frac{e^{(2x)}}{2b}-\frac{a\log\left(\left|be^{(2x)}+a\right|\right)}{2b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x)/(a+b*exp(2*x)),x, algorithm="giac")
[Out] 1/2*e^(2*x)/b - 1/2*a*log(abs(b*e^(2*x) + a))/b^2
```

maple [A] time = 0.01, size = 26, normalized size = 0.84

$$-\frac{a\ln\left(b\,e^{2x}+a\right)}{2b^2}+\frac{e^{2x}}{2b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(4*x)/(a+b*exp(2*x)),x)
```

```
[Out] 1/2/b*exp(x)^2-1/2*a/b^2*ln(a+b*exp(x)^2)
```

maxima [A] time = 0.44, size = 25, normalized size = 0.81

$$\frac{e^{(2x)}}{2b} - \frac{a\log\left(be^{(2x)} + a\right)}{2b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x)/(a+b*exp(2*x)),x, algorithm="maxima")
```

```
[Out] 1/2*e^(2*x)/b - 1/2*a*log(b*e^(2*x) + a)/b^2
```

mupad [B] time = 0.07, size = 24, normalized size = 0.77

$$-\frac{a\ \ln\left(a + b\,\mathrm{e}^{2x}\right) - b\,\mathrm{e}^{2x}}{2b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(4*x)/(a + b*exp(2*x)),x)
```

```
[Out] -(a*log(a + b*exp(2*x)) - b*exp(2*x))/(2*b^2)
```

sympy [A] time = 0.14, size = 29, normalized size = 0.94

$$-\frac{a\log\left(\frac{a}{b} + e^{2x}\right)}{2b^2} + \begin{cases} \frac{e^{2x}}{2b} & \text{for}\ 2b \neq 0 \\ \frac{x}{b} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x)/(a+b*exp(2*x)),x)
```

```
[Out] -a*log(a/b + exp(2*x))/(2*b**2) + Piecewise((exp(2*x)/(2*b), Ne(2*b, 0)), (
x/b, True))
```

3.23 $\int \frac{e^{4x}}{\left(a+be^{2x}\right)^2}\,dx$

Optimal. Leaf size=37

$$\frac{a}{2b^2\left(a+be^{2x}\right)}+\frac{\log\left(a+be^{2x}\right)}{2b^2}$$

```
[Out] 1/2*a/b^2/(a+b*exp(2*x))+1/2*ln(a+b*exp(2*x))/b^2
```

Rubi [A] time = 0.04, antiderivative size = 37, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118, Rules used = {2248, 43}

$$\frac{a}{2b^2\left(a+be^{2x}\right)}+\frac{\log\left(a+be^{2x}\right)}{2b^2}$$

Antiderivative was successfully verified.

```
[In] Int[E^(4*x)/(a + b*E^(2*x))^2,x]
```

```
[Out] a/(2*b^2*(a + b*E^(2*x))) + Log[a + b*E^(2*x)]/(2*b^2)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2248

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(g*h*Log[G])/(d*e*Lo
g[F])]}, Dist[(Denominator[m]*G^(f*h - (c*g*h)/d))/(d*e*Log[F]), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^((e*(c + d*x))/De
nominator[m])], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int \frac{e^{4x}}{\left(a+be^{2x}\right)^2}\,dx = \frac{1}{2}\,\text{Subst}\left(\int \frac{x}{(a+bx)^2}\,dx, x, e^{2x}\right)$$
$$= \frac{1}{2}\,\text{Subst}\left(\int \left(-\frac{a}{b(a+bx)^2}+\frac{1}{b(a+bx)}\right)dx, x, e^{2x}\right)$$
$$= \frac{a}{2b^2\left(a+be^{2x}\right)}+\frac{\log\left(a+be^{2x}\right)}{2b^2}$$

Mathematica [A]   time = 0.03, size = 31, normalized size = 0.84

$$\frac{\frac{a}{a+be^{2x}}+\log\left(a+be^{2x}\right)}{2b^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(4*x)/(a + b*E^(2*x))^2,x]
[Out] (a/(a + b*E^(2*x)) + Log[a + b*E^(2*x)])/(2*b^2)
```

fricas [A]   time = 0.39, size = 38, normalized size = 1.03

$$\frac{\left(be^{(2x)}+a\right)\log\left(be^{(2x)}+a\right)+a}{2\left(b^3e^{(2x)}+ab^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x)/(a+b*exp(2*x))^2,x, algorithm="fricas")
[Out] 1/2*((b*e^(2*x) + a)*log(b*e^(2*x) + a) + a)/(b^3*e^(2*x) + a*b^2)
```

giac [A]   time = 0.36, size = 32, normalized size = 0.86

$$\frac{\log\left(\left|be^{(2x)}+a\right|\right)}{2\,b^2}+\frac{a}{2\left(be^{(2x)}+a\right)b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x)/(a+b*exp(2*x))^2,x, algorithm="giac")
[Out] 1/2*log(abs(b*e^(2*x) + a))/b^2 + 1/2*a/((b*e^(2*x) + a)*b^2)
```

maple [A] time = 0.02, size = 32, normalized size = 0.86

$$\frac{a}{2\left(b\,e^{2x}+a\right)b^{2}}+\frac{\ln\left(b\,e^{2x}+a\right)}{2b^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(4*x)/(b*exp(2*x)+a)^2,x)
[Out] 1/2*a/b^2/(a+b*exp(x)^2)+1/2/b^2*ln(a+b*exp(x)^2)
```

maxima [A] time = 0.44, size = 34, normalized size = 0.92

$$\frac{a}{2\left(b^{3}e^{(2\,x)}+ab^{2}\right)}+\frac{\log\left(be^{(2\,x)}+a\right)}{2\,b^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x)/(a+b*exp(2*x))^2,x, algorithm="maxima")
[Out] 1/2*a/(b^3*e^(2*x) + a*b^2) + 1/2*log(b*e^(2*x) + a)/b^2
```

mupad [B] time = 3.55, size = 34, normalized size = 0.92

$$\frac{\ln\left(a+b\,e^{2\,x}\right)}{2\,b^{2}}-\frac{e^{2\,x}}{2\,b\,\left(a+b\,e^{2\,x}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(4*x)/(a + b*exp(2*x))^2,x)
[Out] log(a + b*exp(2*x))/(2*b^2) - exp(2*x)/(2*b*(a + b*exp(2*x)))
```

sympy [A] time = 0.14, size = 32, normalized size = 0.86

$$\frac{a}{2ab^{2}+2b^{3}e^{2x}}+\frac{\log\left(\frac{a}{b}+e^{2x}\right)}{2b^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x)/(a+b*exp(2*x))**2,x)
[Out] a/(2*a*b**2 + 2*b**3*exp(2*x)) + log(a/b + exp(2*x))/(2*b**2)
```

3.24 $\int \frac{e^{4x}}{\left(a+be^{2x}\right)^3} \, dx$

Optimal. Leaf size=23

$$\frac{e^{4x}}{4a\left(a+be^{2x}\right)^2}$$

```
[Out] 1/4*exp(4*x)/a/(a+b*exp(2*x))^2
```

Rubi [A] time = 0.03, antiderivative size = 23, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118, Rules used = {2248, 37}

$$\frac{e^{4x}}{4a\left(a+be^{2x}\right)^2}$$

Antiderivative was successfully verified.

```
[In] Int[E^(4*x)/(a + b*E^(2*x))^3,x]
```

```
[Out] E^(4*x)/(4*a*(a + b*E^(2*x))^2)
```

Rule 37

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp
[((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] /; FreeQ[{
a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -
1]
```

Rule 2248

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(g*h*Log[G])/(d*e*Lo
g[F])]}, Dist[(Denominator[m]*G^(f*h - (c*g*h)/d))/(d*e*Log[F]), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^((e*(c + d*x))/De
nominator[m])], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int \frac{e^{4x}}{\left(a+be^{2x}\right)^3}\,dx = \frac{1}{2}\,\text{Subst}\left(\int \frac{x}{(a+bx)^3}\,dx, x, e^{2x}\right)$$
$$= \frac{e^{4x}}{4a\left(a+be^{2x}\right)^2}$$

Mathematica [**A**] time = 0.01, size = 23, normalized size = 1.00

$$\frac{e^{4x}}{4a\left(a+be^{2x}\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(4*x)/(a + b*E^(2*x))^3,x]
```

```
[Out] E^(4*x)/(4*a*(a + b*E^(2*x))^2)
```

fricas [**B**] time = 0.41, size = 39, normalized size = 1.70

$$-\frac{2\,be^{(2\,x)}+a}{4\left(b^4e^{(4\,x)}+2\,ab^3e^{(2\,x)}+a^2b^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x)/(a+b*exp(2*x))^3,x, algorithm="fricas")
```

```
[Out] -1/4*(2*b*e^(2*x) + a)/(b^4*e^(4*x) + 2*a*b^3*e^(2*x) + a^2*b^2)
```

giac [**A**] time = 0.30, size = 24, normalized size = 1.04

$$-\frac{2\,be^{(2\,x)}+a}{4\left(be^{(2\,x)}+a\right)^2b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x)/(a+b*exp(2*x))^3,x, algorithm="giac")
```

```
[Out] -1/4*(2*b*e^(2*x) + a)/((b*e^(2*x) + a)^2*b^2)
```

maple [**A**] time = 0.02, size = 33, normalized size = 1.43

$$\frac{a}{4\left(b\,\mathrm{e}^{2x}+a\right)^2b^2}-\frac{1}{2\left(b\,\mathrm{e}^{2x}+a\right)b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(4*x)/(b*exp(2*x)+a)^3,x)
```

```
[Out] -1/2/b^2/(a+b*exp(x)^2)+1/4*a/b^2/(a+b*exp(x)^2)^2
```

maxima [B] time = 0.46, size = 67, normalized size = 2.91

$$-\frac{be^{(2x)}}{2\left(b^4e^{(4x)} + 2ab^3e^{(2x)} + a^2b^2\right)} - \frac{a}{4\left(b^4e^{(4x)} + 2ab^3e^{(2x)} + a^2b^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x)/(a+b*exp(2*x))^3,x, algorithm="maxima")
```

```
[Out] -1/2*b*e^(2*x)/(b^4*e^(4*x) + 2*a*b^3*e^(2*x) + a^2*b^2) - 1/4*a/(b^4*e^(4*
x) + 2*a*b^3*e^(2*x) + a^2*b^2)
```

mupad [B] time = 3.56, size = 31, normalized size = 1.35

$$\frac{e^{4x}}{4a\left(a^2 + 2e^{2x}ab + e^{4x}b^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(4*x)/(a + b*exp(2*x))^3,x)
```

```
[Out] exp(4*x)/(4*a*(b^2*exp(4*x) + a^2 + 2*a*b*exp(2*x)))
```

sympy [B] time = 0.14, size = 41, normalized size = 1.78

$$\frac{-a - 2be^{2x}}{4a^2b^2 + 8ab^3e^{2x} + 4b^4e^{4x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x)/(a+b*exp(2*x))**3,x)
```

```
[Out] (-a - 2*b*exp(2*x))/(4*a**2*b**2 + 8*a*b**3*exp(2*x) + 4*b**4*exp(4*x))
```

3.25 $\int \frac{e^{4x}}{\left(a+be^{2x}\right)^4} \, dx$

Optimal. Leaf size=38

$$\frac{a}{6b^2\left(a+be^{2x}\right)^3}-\frac{1}{4b^2\left(a+be^{2x}\right)^2}$$

```
[Out] 1/6*a/b^2/(a+b*exp(2*x))^3-1/4/b^2/(a+b*exp(2*x))^2
```

Rubi [A] time = 0.04, antiderivative size = 38, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118, Rules used = {2248, 43}

$$\frac{a}{6b^2\left(a+be^{2x}\right)^3}-\frac{1}{4b^2\left(a+be^{2x}\right)^2}$$

Antiderivative was successfully verified.

```
[In] Int[E^(4*x)/(a + b*E^(2*x))^4,x]
```

```
[Out] a/(6*b^2*(a + b*E^(2*x))^3) - 1/(4*b^2*(a + b*E^(2*x))^2)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2248

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(g*h*Log[G])/(d*e*Lo
g[F])]}, Dist[(Denominator[m]*G^(f*h - (c*g*h)/d))/(d*e*Log[F]), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^((e*(c + d*x))/De
nominator[m])], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int \frac{e^{4x}}{\left(a+be^{2x}\right)^4}\,dx = \frac{1}{2}\operatorname{Subst}\left(\int \frac{x}{(a+bx)^4}\,dx, x, e^{2x}\right)$$
$$= \frac{1}{2}\operatorname{Subst}\left(\int \left(-\frac{a}{b(a+bx)^4}+\frac{1}{b(a+bx)^3}\right)dx, x, e^{2x}\right)$$
$$= \frac{a}{6b^2\left(a+be^{2x}\right)^3}-\frac{1}{4b^2\left(a+be^{2x}\right)^2}$$

Mathematica [A] time = 0.02, size = 28, normalized size = 0.74

$$-\frac{a+3be^{2x}}{12b^2\left(a+be^{2x}\right)^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(4*x)/(a + b*E^(2*x))^4,x]
[Out] -1/12*(a + 3*b*E^(2*x))/(b^2*(a + b*E^(2*x))^3)
```

fricas [A] time = 0.43, size = 51, normalized size = 1.34

$$-\frac{3\,be^{(2\,x)}+a}{12\left(b^5e^{(6\,x)}+3\,ab^4e^{(4\,x)}+3\,a^2b^3e^{(2\,x)}+a^3b^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x)/(a+b*exp(2*x))^4,x, algorithm="fricas")
[Out] -1/12*(3*b*e^(2*x) + a)/(b^5*e^(6*x) + 3*a*b^4*e^(4*x) + 3*a^2*b^3*e^(2*x)
+ a^3*b^2)
```

giac [A] time = 0.31, size = 24, normalized size = 0.63

$$-\frac{3\,be^{(2\,x)}+a}{12\left(be^{(2\,x)}+a\right)^3b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x)/(a+b*exp(2*x))^4,x, algorithm="giac")
[Out] -1/12*(3*b*e^(2*x) + a)/((b*e^(2*x) + a)^3*b^2)
```

maple [A] time = 0.02, size = 33, normalized size = 0.87

$$\frac{a}{6\left(b\,\mathrm{e}^{2x}+a\right)^{3}b^{2}}-\frac{1}{4\left(b\,\mathrm{e}^{2x}+a\right)^{2}b^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(4*x)/(b*exp(2*x)+a)^4,x)
```

```
[Out] 1/6*a/b^2/(a+b*exp(x)^2)^3-1/4/b^2/(a+b*exp(x)^2)^2
```

maxima [B] time = 0.68, size = 91, normalized size = 2.39

$$-\frac{be^{(2\,x)}}{4\left(b^5e^{(6\,x)}+3\,ab^4e^{(4\,x)}+3\,a^2b^3e^{(2\,x)}+a^3b^2\right)}-\frac{a}{12\left(b^5e^{(6\,x)}+3\,ab^4e^{(4\,x)}+3\,a^2b^3e^{(2\,x)}+a^3b^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x)/(a+b*exp(2*x))^4,x, algorithm="maxima")
```

```
[Out] -1/4*b*e^(2*x)/(b^5*e^(6*x) + 3*a*b^4*e^(4*x) + 3*a^2*b^3*e^(2*x) + a^3*b^2
) - 1/12*a/(b^5*e^(6*x) + 3*a*b^4*e^(4*x) + 3*a^2*b^3*e^(2*x) + a^3*b^2)
```

mupad [B] time = 3.60, size = 55, normalized size = 1.45

$$\frac{\frac{\mathrm{e}^{4\,x}}{4\,a}+\frac{b\,\mathrm{e}^{6\,x}}{12\,a^2}}{a^3+3\,\mathrm{e}^{2\,x}\,a^2\,b+3\,\mathrm{e}^{4\,x}\,a\,b^2+\mathrm{e}^{6\,x}\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(4*x)/(a + b*exp(2*x))^4,x)
```

```
[Out] (exp(4*x)/(4*a) + (b*exp(6*x))/(12*a^2))/(b^3*exp(6*x) + a^3 + 3*a^2*b*exp(
2*x) + 3*a*b^2*exp(4*x))
```

sympy [A] time = 0.17, size = 54, normalized size = 1.42

$$\frac{-a-3be^{2x}}{12a^3b^2+36a^2b^3e^{2x}+36ab^4e^{4x}+12b^5e^{6x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x)/(a+b*exp(2*x))**4,x)
```

```
[Out] (-a - 3*b*exp(2*x))/(12*a**3*b**2 + 36*a**2*b**3*exp(2*x) + 36*a*b**4*exp(4
*x) + 12*b**5*exp(6*x))
```

3.26 $\int \frac{e^{4x}}{\left(a+be^{2x}\right)^{2/3}}\,dx$

Optimal. Leaf size=42

$$\frac{3\left(a+be^{2x}\right)^{4/3}}{8b^2}-\frac{3a\sqrt[3]{a+be^{2x}}}{2b^2}$$

```
[Out] -3/2*a*(a+b*exp(2*x))^(1/3)/b^2+3/8*(a+b*exp(2*x))^(4/3)/b^2
```

Rubi [A] time = 0.05, antiderivative size = 42, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105, Rules used = {2248, 43}

$$\frac{3\left(a+be^{2x}\right)^{4/3}}{8b^2}-\frac{3a\sqrt[3]{a+be^{2x}}}{2b^2}$$

Antiderivative was successfully verified.

```
[In] Int[E^(4*x)/(a + b*E^(2*x))^(2/3),x]
```

```
[Out] (-3*a*(a + b*E^(2*x))^(1/3))/(2*b^2) + (3*(a + b*E^(2*x))^(4/3))/(8*b^2)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2248

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(g*h*Log[G])/(d*e*Lo
g[F])]}, Dist[(Denominator[m]*G^(f*h - (c*g*h)/d))/(d*e*Log[F]), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^((e*(c + d*x))/De
nominator[m])], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int \frac{e^{4x}}{\left(a+be^{2x}\right)^{2/3}}\,dx = \frac{1}{2}\,\text{Subst}\left(\int \frac{x}{(a+bx)^{2/3}}\,dx, x, e^{2x}\right)$$
$$= \frac{1}{2}\,\text{Subst}\left(\int \left(-\frac{a}{b(a+bx)^{2/3}} + \frac{\sqrt[3]{a+bx}}{b}\right)dx, x, e^{2x}\right)$$
$$= -\frac{3a\sqrt[3]{a+be^{2x}}}{2b^2} + \frac{3\left(a+be^{2x}\right)^{4/3}}{8b^2}$$

Mathematica [**A**] time = 0.02, size = 31, normalized size = 0.74

$$\frac{3\left(be^{2x}-3a\right)\sqrt[3]{a+be^{2x}}}{8b^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(4*x)/(a + b*E^(2*x))^(2/3),x]
[Out] (3*(-3*a + b*E^(2*x))*(a + b*E^(2*x))^(1/3))/(8*b^2)
```

fricas [**A**] time = 0.41, size = 25, normalized size = 0.60

$$\frac{3\left(be^{(2x)}+a\right)^{\frac{1}{3}}\left(be^{(2x)}-3a\right)}{8b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x)/(a+b*exp(2*x))^(2/3),x, algorithm="fricas")
[Out] 3/8*(b*e^(2*x) + a)^(1/3)*(b*e^(2*x) - 3*a)/b^2
```

giac [**A**] time = 0.27, size = 32, normalized size = 0.76

$$\frac{3\left(be^{(2x)}+a\right)^{\frac{4}{3}}}{8b^2} - \frac{3\left(be^{(2x)}+a\right)^{\frac{1}{3}}a}{2b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x)/(a+b*exp(2*x))^(2/3),x, algorithm="giac")
[Out] 3/8*(b*e^(2*x) + a)^(4/3)/b^2 - 3/2*(b*e^(2*x) + a)^(1/3)*a/b^2
```

maple [A] time = 0.02, size = 27, normalized size = 0.64

$$-\frac{3\left(b\,\mathrm{e}^{2x}+a\right)^{\frac{1}{3}}\left(-b\,\mathrm{e}^{2x}+3a\right)}{8b^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(4*x)/(b*exp(2*x)+a)^(2/3),x)
[Out] -3/8*(b*exp(2*x)+a)^(1/3)*(-b*exp(2*x)+3*a)/b^2
```

maxima [A] time = 0.63, size = 32, normalized size = 0.76

$$\frac{3\left(be^{(2\,x)}+a\right)^{\frac{4}{3}}}{8\,b^{2}}-\frac{3\left(be^{(2\,x)}+a\right)^{\frac{1}{3}}a}{2\,b^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x)/(a+b*exp(2*x))^(2/3),x, algorithm="maxima")
[Out] 3/8*(b*e^(2*x) + a)^(4/3)/b^2 - 3/2*(b*e^(2*x) + a)^(1/3)*a/b^2
```

mupad [B] time = 3.49, size = 26, normalized size = 0.62

$$-\frac{3\,\left(3\,a-b\,\mathrm{e}^{2\,x}\right)\,{\left(a+b\,\mathrm{e}^{2\,x}\right)}^{1/3}}{8\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(4*x)/(a + b*exp(2*x))^(2/3),x)
[Out] -(3*(3*a - b*exp(2*x))*(a + b*exp(2*x))^(1/3))/(8*b^2)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{4x}}{\left(a+be^{2x}\right)^{\frac{2}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x)/(a+b*exp(2*x))**(2/3),x)
[Out] Integral(exp(4*x)/(a + b*exp(2*x))**(2/3), x)
```

3.27 $\int e^{-nx}\left(a+be^{nx}\right)\,dx$

Optimal. Leaf size=16

$$bx-\frac{ae^{-nx}}{n}$$

```
[Out] -a/exp(n*x)/n+b*x
```

Rubi [A] time = 0.02, antiderivative size = 16, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {2248, 43}

$$bx-\frac{ae^{-nx}}{n}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*E^(n*x))/E^(n*x),x]
```

```
[Out] -(a/(E^(n*x)*n)) + b*x
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2248

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(g*h*Log[G])/(d*e*Lo
g[F])]}, Dist[(Denominator[m]*G^(f*h - (c*g*h)/d))/(d*e*Log[F]), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^((e*(c + d*x))/De
nominator[m])], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int e^{-nx}\left(a+be^{nx}\right)\,dx=\frac{\text{Subst}\left(\int\frac{a+bx}{x^2}\,dx,x,e^{nx}\right)}{n}$$
$$=\frac{\text{Subst}\left(\int\left(\frac{a}{x^2}+\frac{b}{x}\right)\,dx,x,e^{nx}\right)}{n}$$
$$=-\frac{ae^{-nx}}{n}+bx$$

Mathematica [A] time = 0.01, size = 16, normalized size = 1.00

$$bx-\frac{ae^{-nx}}{n}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*E^(n*x))/E^(n*x),x]
```

```
[Out] -(a/(E^(n*x)*n)) + b*x
```

fricas [A] time = 0.39, size = 21, normalized size = 1.31

$$\frac{\left(bnxe^{(nx)}-a\right)e^{(-nx)}}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(n*x))/exp(n*x),x, algorithm="fricas")
```

```
[Out] (b*n*x*e^(n*x) - a)*e^(-n*x)/n
```

giac [A] time = 0.41, size = 15, normalized size = 0.94

$$bx-\frac{ae^{(-nx)}}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(n*x))/exp(n*x),x, algorithm="giac")
```

```
[Out] b*x - a*e^(-n*x)/n
```

maple [A] time = 0.01, size = 24, normalized size = 1.50

$$-\frac{a\,\mathrm{e}^{-nx}}{n}+\frac{b\ln\left(\mathrm{e}^{nx}\right)}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*exp(n*x)+a)/exp(n*x),x)
```

```
[Out] -a/exp(n*x)/n+1/n*b*ln(exp(n*x))
```

maxima [A] time = 0.69, size = 15, normalized size = 0.94

$$bx - \frac{ae^{(-nx)}}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(n*x))/exp(n*x),x, algorithm="maxima")
```

```
[Out] b*x - a*e^(-n*x)/n
```

mupad [B] time = 0.08, size = 15, normalized size = 0.94

$$b\,x - \frac{a\,\mathrm{e}^{-n\,x}}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(-n*x)*(a + b*exp(n*x)),x)
```

```
[Out] b*x - (a*exp(-n*x))/n
```

sympy [A] time = 0.11, size = 15, normalized size = 0.94

$$bx + \begin{cases} -\frac{ae^{-nx}}{n} & \text{for}\ n \neq 0 \\ ax & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(n*x))/exp(n*x),x)
```

```
[Out] b*x + Piecewise((-a*exp(-n*x)/n, Ne(n, 0)), (a*x, True))
```

3.28 $\int e^{-nx}(a+be^{nx})^2\,dx$

Optimal. Leaf size=32

$$-\frac{a^2e^{-nx}}{n}+2abx+\frac{b^2e^{nx}}{n}$$

```
[Out] -a^2/exp(n*x)/n+b^2*exp(n*x)/n+2*a*b*x
```

Rubi [A] time = 0.03, antiderivative size = 32, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2248, 43}

$$-\frac{a^2e^{-nx}}{n}+2abx+\frac{b^2e^{nx}}{n}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*E^(n*x))^2/E^(n*x),x]
```

```
[Out] -(a^2/(E^(n*x)*n)) + (b^2*E^(n*x))/n + 2*a*b*x
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2248

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(g*h*Log[G])/(d*e*Lo
g[F])]}, Dist[(Denominator[m]*G^(f*h - (c*g*h)/d))/(d*e*Log[F]), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^((e*(c + d*x))/De
nominator[m])], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int e^{-nx}\left(a+be^{nx}\right)^2\,dx=\frac{\text{Subst}\left(\int\frac{(a+bx)^2}{x^2}\,dx,x,e^{nx}\right)}{n}$$
$$=\frac{\text{Subst}\left(\int\left(b^2+\frac{a^2}{x^2}+\frac{2ab}{x}\right)dx,x,e^{nx}\right)}{n}$$
$$=-\frac{a^2e^{-nx}}{n}+\frac{b^2e^{nx}}{n}+2abx$$

Mathematica [**A**] time = 0.02, size = 31, normalized size = 0.97

$$\frac{a^2\left(-e^{-nx}\right)+2abnx+b^2e^{nx}}{n}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*E^(n*x))^2/E^(n*x),x]
[Out] (-(a^2/E^(n*x)) + b^2*E^(n*x) + 2*a*b*n*x)/n
```

fricas [**A**] time = 0.41, size = 34, normalized size = 1.06

$$\frac{\left(2\,abnxe^{(nx)}+b^2e^{(2\,nx)}-a^2\right)e^{(-nx)}}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(n*x))^2/exp(n*x),x, algorithm="fricas")
[Out] (2*a*b*n*x*e^(n*x) + b^2*e^(2*n*x) - a^2)*e^(-n*x)/n
```

giac [**A**] time = 0.32, size = 30, normalized size = 0.94

$$2\,abx+\frac{b^2e^{(nx)}}{n}-\frac{a^2e^{(-nx)}}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(n*x))^2/exp(n*x),x, algorithm="giac")
[Out] 2*a*b*x + b^2*e^(n*x)/n - a^2*e^(-n*x)/n
```

maple [**A**] time = 0.01, size = 39, normalized size = 1.22

$$-\frac{a^2\mathrm{e}^{-nx}}{n}+\frac{2ab\ln\left(\mathrm{e}^{nx}\right)}{n}+\frac{b^2\mathrm{e}^{nx}}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*exp(n*x)+a)^2/exp(n*x),x)
```

```
[Out] b^2*exp(n*x)/n-a^2/exp(n*x)/n+2/n*a*b*ln(exp(n*x))
```

maxima [A] time = 0.68, size = 30, normalized size = 0.94

$$2\,abx + \frac{b^2 e^{(nx)}}{n} - \frac{a^2 e^{(-nx)}}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(n*x))^2/exp(n*x),x, algorithm="maxima")
```

```
[Out] 2*a*b*x + b^2*e^(n*x)/n - a^2*e^(-n*x)/n
```

mupad [B] time = 0.09, size = 30, normalized size = 0.94

$$2\,a\,b\,x - \frac{e^{-n\,x}\,\left(a^2 - b^2\,e^{2\,n\,x}\right)}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(-n*x)*(a + b*exp(n*x))^2,x)
```

```
[Out] 2*a*b*x - (exp(-n*x)*(a^2 - b^2*exp(2*n*x)))/n
```

sympy [A] time = 0.15, size = 39, normalized size = 1.22

$$2abx + \begin{cases} \frac{-a^2ne^{-nx}+b^2ne^{nx}}{n^2} & \text{for } n^2 \neq 0 \\ x\left(a^2 + b^2\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(n*x))**2/exp(n*x),x)
```

```
[Out] 2*a*b*x + Piecewise(((-a**2*n*exp(-n*x) + b**2*n*exp(n*x))/n**2, Ne(n**2, 0
)), (x*(a**2 + b**2), True))
```

3.29 $\int e^{-nx} (a + be^{nx})^3 \, dx$

Optimal. Leaf size=52

$$-\frac{a^3 e^{-nx}}{n} + 3a^2 bx + \frac{3ab^2 e^{nx}}{n} + \frac{b^3 e^{2nx}}{2n}$$

```
[Out] -a^3/exp(n*x)/n+3*a*b^2*exp(n*x)/n+1/2*b^3*exp(2*n*x)/n+3*a^2*b*x
```

Rubi [A] time = 0.04, antiderivative size = 52, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2248, 43}

$$3a^2 bx - \frac{a^3 e^{-nx}}{n} + \frac{3ab^2 e^{nx}}{n} + \frac{b^3 e^{2nx}}{2n}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*E^(n*x))^3/E^(n*x),x]
```

```
[Out] -(a^3/(E^(n*x)*n)) + (3*a*b^2*E^(n*x))/n + (b^3*E^(2*n*x))/(2*n) + 3*a^2*b*
x
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2248

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(g*h*Log[G])/(d*e*Lo
g[F])]}, Dist[(Denominator[m]*G^(f*h - (c*g*h)/d))/(d*e*Log[F]), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^((e*(c + d*x))/De
nominator[m])], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int e^{-nx}(a+be^{nx})^3\,dx = \frac{\text{Subst}\left(\int \frac{(a+bx)^3}{x^2}\,dx, x, e^{nx}\right)}{n}$$
$$= \frac{\text{Subst}\left(\int \left(3ab^2+\frac{a^3}{x^2}+\frac{3a^2b}{x}+b^3x\right)dx, x, e^{nx}\right)}{n}$$
$$= -\frac{a^3e^{-nx}}{n}+\frac{3ab^2e^{nx}}{n}+\frac{b^3e^{2nx}}{2n}+3a^2bx$$

Mathematica [A] time = 0.03, size = 48, normalized size = 0.92

$$\frac{a^3(-e^{-nx})+3a^2bnx+3ab^2e^{nx}+\frac{1}{2}b^3e^{2nx}}{n}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*E^(n*x))^3/E^(n*x),x]
[Out] (-(a^3/E^(n*x)) + 3*a*b^2*E^(n*x) + (b^3*E^(2*n*x))/2 + 3*a^2*b*n*x)/n
```

fricas [A] time = 0.41, size = 48, normalized size = 0.92

$$\frac{\left(6\,a^2bnxe^{(nx)}+b^3e^{(3\,nx)}+6\,ab^2e^{(2\,nx)}-2\,a^3\right)e^{(-nx)}}{2\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(n*x))^3/exp(n*x),x, algorithm="fricas")
[Out] 1/2*(6*a^2*b*n*x*e^(n*x) + b^3*e^(3*n*x) + 6*a*b^2*e^(2*n*x) - 2*a^3)*e^(-n
*x)/n
```

giac [A] time = 0.33, size = 47, normalized size = 0.90

$$3\,a^2bx+\frac{b^3e^{(2\,nx)}}{2\,n}+\frac{3\,ab^2e^{(nx)}}{n}-\frac{a^3e^{(-nx)}}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(n*x))^3/exp(n*x),x, algorithm="giac")
[Out] 3*a^2*b*x + 1/2*b^3*e^(2*n*x)/n + 3*a*b^2*e^(n*x)/n - a^3*e^(-n*x)/n
```

maple [A] time = 0.01, size = 57, normalized size = 1.10

$$-\frac{a^{3}\mathrm{e}^{-nx}}{n}+\frac{3a^{2}b\ln\left(\mathrm{e}^{nx}\right)}{n}+\frac{3a\,b^{2}\mathrm{e}^{nx}}{n}+\frac{b^{3}\mathrm{e}^{2nx}}{2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*exp(n*x)+a)^3/exp(n*x),x)
```

```
[Out] 1/2/n*b^3*exp(n*x)^2+3*a*b^2*exp(n*x)/n-a^3/exp(n*x)/n+3/n*b*a^2*ln(exp(n*x
))
```

maxima [A] time = 0.44, size = 47, normalized size = 0.90

$$3\,a^{2}bx+\frac{b^{3}e^{(2\,nx)}}{2\,n}+\frac{3\,ab^{2}e^{(nx)}}{n}-\frac{a^{3}e^{(-nx)}}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(n*x))^3/exp(n*x),x, algorithm="maxima")
```

```
[Out] 3*a^2*b*x + 1/2*b^3*e^(2*n*x)/n + 3*a*b^2*e^(n*x)/n - a^3*e^(-n*x)/n
```

mupad [B] time = 3.52, size = 44, normalized size = 0.85

$$\frac{\mathrm{e}^{-n\,x}\,\left(-2\,a^{3}+6\,\mathrm{e}^{2\,n\,x}\,a\,b^{2}+\mathrm{e}^{3\,n\,x}\,b^{3}\right)}{2\,n}+3\,a^{2}\,b\,x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(-n*x)*(a + b*exp(n*x))^3,x)
```

```
[Out] (exp(-n*x)*(b^3*exp(3*n*x) - 2*a^3 + 6*a*b^2*exp(2*n*x)))/(2*n) + 3*a^2*b*x
```

sympy [A] time = 0.19, size = 73, normalized size = 1.40

$$3a^{2}bx+\begin{cases}\frac{-2a^{3}n^{2}e^{-nx}+6ab^{2}n^{2}e^{nx}+b^{3}n^{2}e^{2nx}}{2n^{3}} & \text{for}\ 2n^{3}\neq 0\\ x\left(a^{3}+3ab^{2}+b^{3}\right) & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(n*x))**3/exp(n*x),x)
```

```
[Out] 3*a**2*b*x + Piecewise(((-2*a**3*n**2*exp(-n*x) + 6*a*b**2*n**2*exp(n*x) +
b**3*n**2*exp(2*n*x))/(2*n**3), Ne(2*n**3, 0)), (x*(a**3 + 3*a*b**2 + b**3)
, True))
```

3.30 $\int \frac{e^{-nx}}{a+be^{nx}}\,dx$

Optimal. Leaf size=40

$$\frac{b\log\left(a+be^{nx}\right)}{a^2n}-\frac{bx}{a^2}-\frac{e^{-nx}}{an}$$

```
[Out] -1/a/exp(n*x)/n-b*x/a^2+b*ln(a+b*exp(n*x))/a^2/n
```

Rubi **[A]** time = 0.04, antiderivative size = 40, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2248, 44}

$$\frac{b\log\left(a+be^{nx}\right)}{a^2n}-\frac{bx}{a^2}-\frac{e^{-nx}}{an}$$

Antiderivative was successfully verified.

```
[In] Int[1/(E^(n*x)*(a + b*E^(n*x))),x]
```

```
[Out] -(1/(a*E^(n*x)*n)) - (b*x)/a^2 + (b*Log[a + b*E^(n*x)])/(a^2*n)
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2248

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(g*h*Log[G])/(d*e*Lo
g[F])]}, Dist[(Denominator[m]*G^(f*h - (c*g*h)/d))/(d*e*Log[F]), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^((e*(c + d*x))/De
nominator[m])], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int \frac{e^{-nx}}{a+be^{nx}}\,dx = \frac{\text{Subst}\left(\int \frac{1}{x^2(a+bx)}\,dx, x, e^{nx}\right)}{n}$$
$$= \frac{\text{Subst}\left(\int \left(\frac{1}{ax^2}-\frac{b}{a^2x}+\frac{b^2}{a^2(a+bx)}\right)dx, x, e^{nx}\right)}{n}$$
$$= -\frac{e^{-nx}}{an}-\frac{bx}{a^2}+\frac{b\log\left(a+be^{nx}\right)}{a^2n}$$

Mathematica [A] time = 0.04, size = 34, normalized size = 0.85

$$-\frac{-b\log\left(a+be^{nx}\right)+ae^{-nx}+bnx}{a^2n}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(E^(n*x)*(a + b*E^(n*x))),x]
[Out] -((a/E^(n*x) + b*n*x - b*Log[a + b*E^(n*x)])/(a^2*n))
```

fricas [A] time = 0.43, size = 39, normalized size = 0.98

$$-\frac{\left(bnxe^{(nx)}-be^{(nx)}\log\left(be^{(nx)}+a\right)+a\right)e^{(-nx)}}{a^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/exp(n*x)/(a+b*exp(n*x)),x, algorithm="fricas")
[Out] -(b*n*x*e^(n*x) - b*e^(n*x)*log(b*e^(n*x) + a) + a)*e^(-n*x)/(a^2*n)
```

giac [A] time = 0.32, size = 38, normalized size = 0.95

$$-\frac{\frac{bnx}{a^2}+\frac{e^{(-nx)}}{a}-\frac{b\log\left(\left|be^{(nx)}+a\right|\right)}{a^2}}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/exp(n*x)/(a+b*exp(n*x)),x, algorithm="giac")
[Out] -(b*n*x/a^2 + e^(-n*x)/a - b*log(abs(b*e^(n*x) + a))/a^2)/n
```

maple [A] time = 0.01, size = 47, normalized size = 1.18

$$-\frac{\mathrm{e}^{-nx}}{an}+\frac{b\ln\left(b\,\mathrm{e}^{nx}+a\right)}{a^2n}-\frac{b\ln\left(\mathrm{e}^{nx}\right)}{a^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/exp(n*x)/(b*exp(n*x)+a),x)
```

```
[Out] -1/a/exp(n*x)/n-1/n/a^2*b*ln(exp(n*x))+b*ln(b*exp(n*x)+a)/a^2/n
```

maxima [A] time = 0.43, size = 32, normalized size = 0.80

$$-\frac{e^{(-nx)}}{an} + \frac{b\log\left(ae^{(-nx)} + b\right)}{a^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/exp(n*x)/(a+b*exp(n*x)),x, algorithm="maxima")
```

```
[Out] -e^(-n*x)/(a*n) + b*log(a*e^(-n*x) + b)/(a^2*n)
```

mupad [B] time = 3.57, size = 38, normalized size = 0.95

$$\frac{b\,\ln\left(a + b\,e^{n\,x}\right)}{a^2\,n} - \frac{b\,x}{a^2} - \frac{e^{-n\,x}}{a\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(-n*x)/(a + b*exp(n*x)),x)
```

```
[Out] (b*log(a + b*exp(n*x)))/(a^2*n) - (b*x)/a^2 - exp(-n*x)/(a*n)
```

sympy [A] time = 0.16, size = 34, normalized size = 0.85

$$\begin{cases} -\frac{e^{-nx}}{an} & \text{for}\ an \neq 0 \\ \frac{x}{a} & \text{otherwise} \end{cases} + \frac{b\log\left(e^{-nx} + \frac{b}{a}\right)}{a^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/exp(n*x)/(a+b*exp(n*x)),x)
```

```
[Out] Piecewise((-exp(-n*x)/(a*n), Ne(a*n, 0)), (x/a, True)) + b*log(exp(-n*x) +
b/a)/(a**2*n)
```

3.31 $\int \frac{e^{-nx}}{(a+be^{nx})^2}\,dx$

Optimal. Leaf size=61

$$\frac{2b\log\left(a+be^{nx}\right)}{a^3n}-\frac{2bx}{a^3}-\frac{b}{a^2n\left(a+be^{nx}\right)}-\frac{e^{-nx}}{a^2n}$$

```
[Out] -1/a^2/exp(n*x)/n-b/a^2/(a+b*exp(n*x))/n-2*b*x/a^3+2*b*ln(a+b*exp(n*x))/a^3
/n
```

Rubi [A] time = 0.06, antiderivative size = 61, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2248, 44}

$$-\frac{b}{a^2n\left(a+be^{nx}\right)}+\frac{2b\log\left(a+be^{nx}\right)}{a^3n}-\frac{2bx}{a^3}-\frac{e^{-nx}}{a^2n}$$

Antiderivative was successfully verified.

```
[In] Int[1/(E^(n*x)*(a + b*E^(n*x))^2),x]
```

```
[Out] -(1/(a^2*E^(n*x)*n)) - b/(a^2*(a + b*E^(n*x))*n) - (2*b*x)/a^3 + (2*b*Log[a
 + b*E^(n*x)])/(a^3*n)
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2248

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(g*h*Log[G])/(d*e*Lo
g[F])]}, Dist[(Denominator[m]*G^(f*h - (c*g*h)/d))/(d*e*Log[F]), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^((e*(c + d*x))/De
nominator[m])], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int \frac{e^{-nx}}{(a+be^{nx})^2}\,dx = \frac{\text{Subst}\left(\int \frac{1}{x^2(a+bx)^2}\,dx, x, e^{nx}\right)}{n}$$
$$= \frac{\text{Subst}\left(\int \left(\frac{1}{a^2x^2} - \frac{2b}{a^3x} + \frac{b^2}{a^2(a+bx)^2} + \frac{2b^2}{a^3(a+bx)}\right)dx, x, e^{nx}\right)}{n}$$
$$= -\frac{e^{-nx}}{a^2n} - \frac{b}{a^2(a+be^{nx})\,n} - \frac{2bx}{a^3} + \frac{2b\log(a+be^{nx})}{a^3n}$$

Mathematica [A] time = 0.11, size = 49, normalized size = 0.80

$$-\frac{a\left(\frac{b}{a+be^{nx}} + e^{-nx}\right) - 2b\log(a+be^{nx}) + 2bnx}{a^3n}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(E^(n*x)*(a + b*E^(n*x))^2),x]
```

```
[Out] -((a*(E^(-(n*x)) + b/(a + b*E^(n*x))) + 2*b*n*x - 2*b*Log[a + b*E^(n*x)])/(
a^3*n))
```

fricas [A] time = 0.43, size = 84, normalized size = 1.38

$$-\frac{2\,b^2nxe^{(2\,nx)} + a^2 + 2\,(abnx+ab)e^{(nx)} - 2\left(b^2e^{(2\,nx)} + abe^{(nx)}\right)\log\left(be^{(nx)}+a\right)}{a^3bne^{(2\,nx)} + a^4ne^{(nx)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/exp(n*x)/(a+b*exp(n*x))^2,x, algorithm="fricas")
```

```
[Out] -(2*b^2*n*x*e^(2*n*x) + a^2 + 2*(a*b*n*x + a*b)*e^(n*x) - 2*(b^2*e^(2*n*x)
+ a*b*e^(n*x))*log(b*e^(n*x) + a))/(a^3*b*n*e^(2*n*x) + a^4*n*e^(n*x))
```

giac [A] time = 0.25, size = 59, normalized size = 0.97

$$-\frac{\frac{2\,bnx}{a^3} - \frac{2\,b\log\left(\left|be^{(nx)}+a\right|\right)}{a^3} + \frac{2\,be^{(nx)}+a}{\left(be^{(2\,nx)}+ae^{(nx)}\right)a^2}}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/exp(n*x)/(a+b*exp(n*x))^2,x, algorithm="giac")
```

```
[Out] -(2*b*n*x/a^3 - 2*b*log(abs(b*e^(n*x) + a))/a^3 + (2*b*e^(n*x) + a)/((b*e^(
2*n*x) + a*e^(n*x))*a^2))/n
```

maple [A] time = 0.01, size = 67, normalized size = 1.10

$$-\frac{b}{\left(b\,e^{nx}+a\right)a^{2}n}-\frac{e^{-nx}}{a^{2}n}+\frac{2b\ln\left(b\,e^{nx}+a\right)}{a^{3}n}-\frac{2b\ln\left(e^{nx}\right)}{a^{3}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/exp(n*x)/(b*exp(n*x)+a)^2,x)
```

```
[Out] -1/a^2/exp(n*x)/n-2/n/a^3*b*ln(exp(n*x))-b/a^2/(b*exp(n*x)+a)/n+2*b*ln(b*ex
p(n*x)+a)/a^3/n
```

maxima [A] time = 0.44, size = 57, normalized size = 0.93

$$\frac{b^{2}}{\left(a^{4}e^{(-nx)}+a^{3}b\right)n}-\frac{e^{(-nx)}}{a^{2}n}+\frac{2\,b\log\left(ae^{(-nx)}+b\right)}{a^{3}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/exp(n*x)/(a+b*exp(n*x))^2,x, algorithm="maxima")
```

```
[Out] b^2/((a^4*e^(-n*x) + a^3*b)*n) - e^(-n*x)/(a^2*n) + 2*b*log(a*e^(-n*x) + b)
/(a^3*n)
```

mupad [B] time = 3.67, size = 86, normalized size = 1.41

$$\frac{2\,b\,\ln\left(a+b\,e^{n\,x}\right)}{a^{3}\,n}-\frac{\frac{1}{a\,n}+\frac{2\,b^{2}\,x\,e^{2\,n\,x}}{a^{3}}-\frac{2\,b^{2}\,e^{2\,n\,x}}{a^{3}\,n}+\frac{2\,b\,x\,e^{n\,x}}{a^{2}}}{a\,e^{n\,x}+b\,e^{2\,n\,x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(-n*x)/(a + b*exp(n*x))^2,x)
```

```
[Out] (2*b*log(a + b*exp(n*x)))/(a^3*n) - (1/(a*n) + (2*b^2*x*exp(2*n*x))/a^3 - (
2*b^2*exp(2*n*x))/(a^3*n) + (2*b*x*exp(n*x))/a^2)/(a*exp(n*x) + b*exp(2*n*x
))
```

sympy [A] time = 0.19, size = 61, normalized size = 1.00

$$\frac{b^{2}}{a^{4}ne^{-nx}+a^{3}bn}+\begin{cases}-\frac{e^{-nx}}{a^{2}n} & \text{for}\ a^{2}n\neq 0\\ \frac{x}{a^{2}} & \text{otherwise}\end{cases}+\frac{2b\log\left(e^{-nx}+\frac{b}{a}\right)}{a^{3}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/exp(n*x)/(a+b*exp(n*x))**2,x)
```

```
[Out] b**2/(a**4*n*exp(-n*x) + a**3*b*n) + Piecewise((-exp(-n*x)/(a**2*n), Ne(a**
2*n, 0)), (x/a**2, True)) + 2*b*log(exp(-n*x) + b/a)/(a**3*n)
```

3.32 $\int \frac{e^{-nx}}{(a+be^{nx})^3}\,dx$

Optimal. Leaf size=83

$$\frac{3b\log(a+be^{nx})}{a^4n}-\frac{3bx}{a^4}-\frac{2b}{a^3n(a+be^{nx})}-\frac{e^{-nx}}{a^3n}-\frac{b}{2a^2n(a+be^{nx})^2}$$

```
[Out] -1/a^3/exp(n*x)/n-1/2*b/a^2/(a+b*exp(n*x))^2/n-2*b/a^3/(a+b*exp(n*x))/n-3*b
*x/a^4+3*b*ln(a+b*exp(n*x))/a^4/n
```

Rubi [A] time = 0.07, antiderivative size = 83, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2248, 44}

$$-\frac{2b}{a^3n(a+be^{nx})}-\frac{b}{2a^2n(a+be^{nx})^2}+\frac{3b\log(a+be^{nx})}{a^4n}-\frac{3bx}{a^4}-\frac{e^{-nx}}{a^3n}$$

Antiderivative was successfully verified.

```
[In] Int[1/(E^(n*x)*(a + b*E^(n*x))^3),x]
```

```
[Out] -(1/(a^3*E^(n*x)*n)) - b/(2*a^2*(a + b*E^(n*x))^2*n) - (2*b)/(a^3*(a + b*E^
(n*x))*n) - (3*b*x)/a^4 + (3*b*Log[a + b*E^(n*x)])/(a^4*n)
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2248

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(g*h*Log[G])/(d*e*Lo
g[F])]}, Dist[(Denominator[m]*G^(f*h - (c*g*h)/d))/(d*e*Log[F]), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^((e*(c + d*x))/De
nominator[m])], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int \frac{e^{-nx}}{(a+be^{nx})^3}\,dx = \frac{\text{Subst}\left(\int \frac{1}{x^2(a+bx)^3}\,dx, x, e^{nx}\right)}{n}$$
$$= \frac{\text{Subst}\left(\int \left(\frac{1}{a^3x^2} - \frac{3b}{a^4x} + \frac{b^2}{a^2(a+bx)^3} + \frac{2b^2}{a^3(a+bx)^2} + \frac{3b^2}{a^4(a+bx)}\right) dx, x, e^{nx}\right)}{n}$$
$$= -\frac{e^{-nx}}{a^3n} - \frac{b}{2a^2\,(a+be^{nx})^2\,n} - \frac{2b}{a^3\,(a+be^{nx})\,n} - \frac{3bx}{a^4} + \frac{3b\log\left(a+be^{nx}\right)}{a^4n}$$

Mathematica [A] time = 0.14, size = 69, normalized size = 0.83

$$-\frac{\frac{a^2b}{(a+be^{nx})^2} + \frac{4ab}{a+be^{nx}} - 6b\log\left(a+be^{nx}\right) + 2ae^{-nx} + 6bnx}{2a^4n}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(E^(n*x)*(a + b*E^(n*x))^3),x]
```

```
[Out] -1/2*((2*a)/E^(n*x) + (a^2*b)/(a + b*E^(n*x))^2 + (4*a*b)/(a + b*E^(n*x)) +
 6*b*n*x - 6*b*Log[a + b*E^(n*x)])/(a^4*n)
```

fricas [A] time = 0.43, size = 140, normalized size = 1.69

$$-\frac{6\,b^3nxe^{(3\,nx)} + 2\,a^3 + 6\left(2\,ab^2nx + ab^2\right)e^{(2\,nx)} + 3\left(2\,a^2bnx + 3\,a^2b\right)e^{(nx)} - 6\left(b^3e^{(3\,nx)} + 2\,ab^2e^{(2\,nx)} + a^2be^{(nx)}\right)\text{lo}}{2\left(a^4b^2ne^{(3\,nx)} + 2\,a^5bne^{(2\,nx)} + a^6ne^{(nx)}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/exp(n*x)/(a+b*exp(n*x))^3,x, algorithm="fricas")
```

```
[Out] -1/2*(6*b^3*n*x*e^(3*n*x) + 2*a^3 + 6*(2*a*b^2*n*x + a*b^2)*e^(2*n*x) + 3*(
2*a^2*b*n*x + 3*a^2*b)*e^(n*x) - 6*(b^3*e^(3*n*x) + 2*a*b^2*e^(2*n*x) + a^2
*b*e^(n*x))*log(b*e^(n*x) + a))/(a^4*b^2*n*e^(3*n*x) + 2*a^5*b*n*e^(2*n*x)
+ a^6*n*e^(n*x))
```

giac [A] time = 0.40, size = 76, normalized size = 0.92

$$-\frac{\frac{6\,bnx}{a^4} - \frac{6\,b\log\left(\left|be^{(nx)}+a\right|\right)}{a^4} + \frac{\left(6\,ab^2e^{(2\,nx)} + 9\,a^2be^{(nx)} + 2\,a^3\right)e^{(-nx)}}{\left(be^{(nx)}+a\right)^2a^4}}{2\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/exp(n*x)/(a+b*exp(n*x))^3,x, algorithm="giac")
```

```
[Out] -1/2*(6*b*n*x/a^4 - 6*b*log(abs(b*e^(n*x) + a))/a^4 + (6*a*b^2*e^(2*n*x) +
9*a^2*b*e^(n*x) + 2*a^3)*e^(-n*x)/((b*e^(n*x) + a)^2*a^4))/n
```

maple [A] time = 0.01, size = 86, normalized size = 1.04

$$-\frac{b}{2\left(b\,\mathrm{e}^{nx}+a\right)^{2}a^{2}n}-\frac{2b}{\left(b\,\mathrm{e}^{nx}+a\right)a^{3}n}-\frac{\mathrm{e}^{-nx}}{a^{3}n}+\frac{3b\ln\left(b\,\mathrm{e}^{nx}+a\right)}{a^{4}n}-\frac{3b\ln\left(\mathrm{e}^{nx}\right)}{a^{4}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/exp(n*x)/(b*exp(n*x)+a)^3,x)
```

```
[Out] -1/a^3/exp(n*x)/n-3/n/a^4*b*ln(exp(n*x))-1/2*b/a^2/(b*exp(n*x)+a)^2/n+3*b*l
n(b*exp(n*x)+a)/a^4/n-2*b/a^3/(b*exp(n*x)+a)/n
```

maxima [A] time = 0.63, size = 85, normalized size = 1.02

$$\frac{6\,ab^{2}e^{(-nx)}+5\,b^{3}}{2\left(2\,a^{5}be^{(-nx)}+a^{6}e^{(-2\,nx)}+a^{4}b^{2}\right)n}-\frac{e^{(-nx)}}{a^{3}n}+\frac{3\,b\log\left(ae^{(-nx)}+b\right)}{a^{4}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/exp(n*x)/(a+b*exp(n*x))^3,x, algorithm="maxima")
```

```
[Out] 1/2*(6*a*b^2*e^(-n*x) + 5*b^3)/((2*a^5*b*e^(-n*x) + a^6*e^(-2*n*x) + a^4*b^
2)*n) - e^(-n*x)/(a^3*n) + 3*b*log(a*e^(-n*x) + b)/(a^4*n)
```

mupad [B] time = 0.19, size = 104, normalized size = 1.25

$$\frac{\frac{6\,b^{2}\,\mathrm{e}^{2\,n\,x}}{a^{3}\,n}-\frac{1}{a\,n}+\frac{9\,b^{3}\,\mathrm{e}^{3\,n\,x}}{2\,a^{4}\,n}}{\mathrm{e}^{n\,x}\,a^{2}+2\,\mathrm{e}^{2\,n\,x}\,a\,b+\mathrm{e}^{3\,n\,x}\,b^{2}}-\frac{3\,b\,\ln\left(\mathrm{e}^{n\,x}\right)}{a^{4}\,n}+\frac{3\,b\,\ln\left(a+b\,\mathrm{e}^{n\,x}\right)}{a^{4}\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(-n*x)/(a + b*exp(n*x))^3,x)
```

```
[Out] ((6*b^2*exp(2*n*x))/(a^3*n) - 1/(a*n) + (9*b^3*exp(3*n*x))/(2*a^4*n))/(a^2*
exp(n*x) + b^2*exp(3*n*x) + 2*a*b*exp(2*n*x)) - (3*b*log(exp(n*x)))/(a^4*n)
 + (3*b*log(a + b*exp(n*x)))/(a^4*n)
```

sympy [A] time = 0.22, size = 95, normalized size = 1.14

$$\frac{6ab^{2}e^{-nx}+5b^{3}}{2a^{6}ne^{-2nx}+4a^{5}bne^{-nx}+2a^{4}b^{2}n}+\begin{cases}-\frac{e^{-nx}}{a^{3}n} & \text{for}\ a^{3}n\neq 0\\ \frac{x}{a^{3}} & \text{otherwise}\end{cases}+\frac{3b\log\left(e^{-nx}+\frac{b}{a}\right)}{a^{4}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/exp(n*x)/(a+b*exp(n*x))**3,x)
```

```
[Out] (6*a*b**2*exp(-n*x) + 5*b**3)/(2*a**6*n*exp(-2*n*x) + 4*a**5*b*n*exp(-n*x)
+ 2*a**4*b**2*n) + Piecewise((-exp(-n*x)/(a**3*n), Ne(a**3*n, 0)), (x/a**3,
 True)) + 3*b*log(exp(-n*x) + b/a)/(a**4*n)
```

3.33 $\int \frac{f^{a+bx}}{c+df^{e+2bx}} \, dx$

Optimal. Leaf size=50

$$\frac{f^{a-\frac{e}{2}} \tan^{-1}\left(\frac{\sqrt{d} f^{bx+\frac{e}{2}}}{\sqrt{c}}\right)}{b\sqrt{c}\sqrt{d}\log(f)}$$

```
[Out] f^(a-1/2*e)*arctan(f^(1/2*e+b*x)*d^(1/2)/c^(1/2))/b/ln(f)/c^(1/2)/d^(1/2)
```

Rubi [A] time = 0.08, antiderivative size = 50, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {2249, 205}

$$\frac{f^{a-\frac{e}{2}} \tan^{-1}\left(\frac{\sqrt{d} f^{bx+\frac{e}{2}}}{\sqrt{c}}\right)}{b\sqrt{c}\sqrt{d}\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x)/(c + d*f^(e + 2*b*x)),x]
```

```
[Out] (f^(a - e/2)*ArcTan[(Sqrt[d]*f^(e/2 + b*x))/Sqrt[c]])/(b*Sqrt[c]*Sqrt[d]*Lo
g[f])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\int \frac{f^{a+bx}}{c+df^{e+2bx}}\,dx = \frac{\text{Subst}\left(\int \frac{1}{c+df^{-2a+e}x^2}\,dx, x, f^{a+bx}\right)}{b\log(f)} = \frac{f^{a-\frac{e}{2}}\tan^{-1}\left(\frac{\sqrt{d}\,f^{\frac{e}{2}+bx}}{\sqrt{c}}\right)}{b\sqrt{c}\,\sqrt{d}\,\log(f)}$$

Mathematica [A] time = 0.03, size = 50, normalized size = 1.00

$$\frac{f^{a-\frac{e}{2}}\tan^{-1}\left(\frac{\sqrt{d}\,f^{bx+\frac{e}{2}}}{\sqrt{c}}\right)}{b\sqrt{c}\,\sqrt{d}\,\log(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x)/(c + d*f^(e + 2*b*x)),x]
```

```
[Out] (f^(a - e/2)*ArcTan[(Sqrt[d]*f^(e/2 + b*x))/Sqrt[c]])/(b*Sqrt[c]*Sqrt[d]*Lo
g[f])
```

fricas [A] time = 0.43, size = 179, normalized size = 3.58

$$\left[-\frac{\sqrt{-cdf^{-2a+e}}\log\left(\frac{df^{2bx+2a}f^{-2a+e}-2\sqrt{-cdf^{-2a+e}}\,f^{bx+a}-c}{df^{2bx+2a}f^{-2a+e}+c}\right)}{2\,bcdf^{-2a+e}\log(f)}, -\frac{\sqrt{cdf^{-2a+e}}\arctan\left(\frac{\sqrt{cdf^{-2a+e}}}{df^{bx+a}f^{-2a+e}}\right)}{bcdf^{-2a+e}\log(f)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x+a)/(c+d*f^(2*b*x+e)),x, algorithm="fricas")
```

```
[Out] [-1/2*sqrt(-c*d*f^(-2*a + e))*log((d*f^(2*b*x + 2*a)*f^(-2*a + e) - 2*sqrt(
-c*d*f^(-2*a + e))*f^(b*x + a) - c)/(d*f^(2*b*x + 2*a)*f^(-2*a + e) + c))/(
b*c*d*f^(-2*a + e)*log(f)), -sqrt(c*d*f^(-2*a + e))*arctan(sqrt(c*d*f^(-2*a
 + e))/(d*f^(b*x + a)*f^(-2*a + e)))/(b*c*d*f^(-2*a + e)*log(f))]
```

giac [A] time = 0.30, size = 48, normalized size = 0.96

$$\frac{f^{2a}\arctan\left(\frac{df^{bx}f^{e}}{\sqrt{cdf^{e}}}\right)}{\sqrt{cdf^{e}}\,bf^{a}\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x+a)/(c+d*f^(2*b*x+e)),x, algorithm="giac")
```

```
[Out] f^(2*a)*arctan(d*f^(b*x)*f^e/sqrt(c*d*f^e))/(sqrt(c*d*f^e)*b*f^a*log(f))
```

maple [B] time = 0.08, size = 91, normalized size = 1.82

$$-\frac{f^{a} \ln \left(-\frac{c\,f^{a}}{\sqrt{-c d\,f^{e}}}+f^{b x +a}\right)}{2 \sqrt{-c d\,f^{e}}\, b \ln \left(f \right)}+\frac{f^{a} \ln \left(\frac{c\,f^{a}}{\sqrt{-c d\,f^{e}}}+f^{b x +a}\right)}{2 \sqrt{-c d\,f^{e}}\, b \ln \left(f \right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x+a)/(c+d*f^(2*b*x+e)),x)
```

```
[Out] -1/2/(-f^e*c*d)^(1/2)*f^a/b/ln(f)*ln(f^(b*x+a)-1/(-f^e*c*d)^(1/2)*f^a*c)+1/
2/(-f^e*c*d)^(1/2)*f^a/b/ln(f)*ln(f^(b*x+a)+1/(-f^e*c*d)^(1/2)*f^a*c)
```

maxima [A] time = 1.01, size = 45, normalized size = 0.90

$$\frac{f^{a} \arctan\left(\frac{d f^{b x+e}}{\sqrt{c d} f^{\frac{1}{2} e}}\right)}{\sqrt{c d} b f^{\frac{1}{2} e} \log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x+a)/(c+d*f^(2*b*x+e)),x, algorithm="maxima")
```

```
[Out] f^a*arctan(d*f^(b*x + e)/(sqrt(c*d)*f^(1/2*e)))/(sqrt(c*d)*b*f^(1/2*e)*log(
f))
```

mupad [B] time = 3.85, size = 64, normalized size = 1.28

$$\frac{\mathrm{atan}\left(\frac{f^{a+b\,x}\,\sqrt{b^2\,c\,d\,f^e\,{\ln\left(f\right)}^2}}{b\,c\,\ln\left(f\right)\,\sqrt{f^{2\,a}}}\right)\,\sqrt{f^{2\,a}}}{\sqrt{b^2\,c\,d\,f^e\,{\ln\left(f\right)}^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x)/(c + d*f^(e + 2*b*x)),x)
```

```
[Out] (atan((f^(a + b*x)*(b^2*c*d*f^e*log(f)^2)^(1/2))/(b*c*log(f)*(f^(2*a))^(1/2
)))*(f^(2*a))^(1/2))/(b^2*c*d*f^e*log(f)^2)^(1/2)
```

sympy [A] time = 0.87, size = 51, normalized size = 1.02

$$\operatorname{RootSum}{\left(4 z^{2} b^{2} c d e^{e \log{\left(f \right)}} \log{\left(f \right)}^{2} + e^{2 a \log{\left(f \right)}}, \left(i \mapsto i \log{\left(2 i b c \log{\left(f \right)} + f^{a + b x} \right)} \right)\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x+a)/(c+d*f**(2*b*x+e)),x)
```

```
[Out] RootSum(4*_z**2*b**2*c*d*exp(e*log(f))*log(f)**2 + exp(2*a*log(f)), Lambda(
_i, _i*log(2*_i*b*c*log(f) + f**(a + b*x))))
```

3.34 $\int \frac{f^{a+2bx}}{c+df^{e+2bx}}\,dx$

Optimal. Leaf size=34

$$\frac{f^{a-e}\log\left(df^{2bx+e}+c\right)}{2bd\log(f)}$$

```
[Out] 1/2*f^(a-e)*ln(c+d*f^(2*b*x+e))/b/d/ln(f)
```

Rubi [A] time = 0.08, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used = {2247, 2246, 31}

$$\frac{f^{a-e}\log\left(df^{2bx+e}+c\right)}{2bd\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + 2*b*x)/(c + d*f^(e + 2*b*x)),x]
```

```
[Out] (f^(a - e)*Log[c + d*f^(e + 2*b*x)])/(2*b*d*Log[f])
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x, x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2246

```
Int[((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)*((a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.))^(p_.), x_Symbol] :> Dist[1/(d*e*n*Log[F]), Subst[Int[(a + b*x)^p, x], x, (F^(e*(c + d*x)))^n], x] /; FreeQ[{F, a, b, c, d, e, n, p}, x]
```

Rule 2247

```
Int[((a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.))^(p_.)*((G_)^((h_.)*((f_.) + (g_.)*(x_))))^(m_.), x_Symbol] :> Dist[(G^(h*(f + g*x)))^m/(F^(e*(c + d*x)))^n, Int[(F^(e*(c + d*x)))^n*(a + b*(F^(e*(c + d*x)))^n)^p, x], x] /; FreeQ[{F, G, a, b, c, d, e, f, g, h, m, n, p}, x] && EqQ[d*e*n*Log[F], g*h*m*Log[G]]
```

Rubi steps

$$\int \frac{f^{a+2bx}}{c+df^{e+2bx}}\,dx = f^{a-e}\int \frac{f^{e+2bx}}{c+df^{e+2bx}}\,dx$$
$$= \frac{f^{a-e}\,\text{Subst}\left(\int \frac{1}{c+dx}\,dx, x, f^{e+2bx}\right)}{2b\log(f)}$$
$$= \frac{f^{a-e}\log\left(c+df^{e+2bx}\right)}{2bd\log(f)}$$

Mathematica [A] time = 0.02, size = 34, normalized size = 1.00

$$\frac{f^{a-e}\log\left(df^{2bx+e}+c\right)}{2bd\log(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + 2*b*x)/(c + d*f^(e + 2*b*x)),x]
[Out] (f^(a - e)*Log[c + d*f^(e + 2*b*x)])/(2*b*d*Log[f])
```

fricas [A] time = 0.42, size = 32, normalized size = 0.94

$$\frac{f^{a-e}\log\left(df^{2\,bx+e}+c\right)}{2\,bd\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(2*b*x+a)/(c+d*f^(2*b*x+e)),x, algorithm="fricas")
[Out] 1/2*f^(a - e)*log(d*f^(2*b*x + e) + c)/(b*d*log(f))
```

giac [A] time = 0.33, size = 37, normalized size = 1.09

$$\frac{f^{a}\log\left(\left|df^{2\,bx}f^{e}+c\right|\right)}{2\,bdf^{e}\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(2*b*x+a)/(c+d*f^(2*b*x+e)),x, algorithm="giac")
[Out] 1/2*f^a*log(abs(d*f^(2*b*x)*f^e + c))/(b*d*f^e*log(f))
```

maple [A]   time = 0.03, size = 47, normalized size = 1.38

$$\frac{f^{a} f^{-e} \ln\left(d\,\mathrm{e}^{(2bx+a)\ln(f)}\mathrm{e}^{-a\ln(f)+e\ln(f)}+c\right)}{2bd\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(2*b*x+a)/(c+d*f^(2*b*x+e)),x)
```

```
[Out] 1/2/(f^e)/d/ln(f)/b*f^a*ln(c+d*exp(-ln(f)*a+ln(f)*e)*exp((2*b*x+a)*ln(f)))
```

maxima [A]   time = 0.43, size = 32, normalized size = 0.94

$$\frac{f^{a-e}\log\left(d f^{2\,bx+e}+c\right)}{2\,bd\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(2*b*x+a)/(c+d*f^(2*b*x+e)),x, algorithm="maxima")
```

```
[Out] 1/2*f^(a - e)*log(d*f^(2*b*x + e) + c)/(b*d*log(f))
```

mupad [B]   time = 3.63, size = 37, normalized size = 1.09

$$\frac{f^{a-e}\,\ln\left(d\,f^{a+e+2\,b\,x}+c\,f^{a}\right)}{2\,b\,d\,\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + 2*b*x)/(c + d*f^(e + 2*b*x)),x)
```

```
[Out] (f^(a - e)*log(d*f^(a + e + 2*b*x) + c*f^a))/(2*b*d*log(f))
```

sympy [A]   time = 0.77, size = 42, normalized size = 1.24

$$\frac{e^{(a-e)\log(f)}\log\left(\frac{ce^{a\log(f)}e^{-e\log(f)}}{d}+f^{a+2bx}\right)}{2bd\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(2*b*x+a)/(c+d*f**(2*b*x+e)),x)
```

```
[Out] exp((a - e)*log(f))*log(c*exp(a*log(f))*exp(-e*log(f))/d + f**(a + 2*b*x))/
(2*b*d*log(f))
```

3.35 $\int \frac{f^{a+3bx}}{c+df^{e+2bx}}\,dx$

Optimal. Leaf size=88

$$\frac{f^{\frac{1}{2}(2a-3e)+\frac{1}{2}(2bx+e)}}{bd\log(f)}-\frac{\sqrt{c}\,f^{a-\frac{3e}{2}}\tan^{-1}\left(\frac{\sqrt{d}\,f^{\frac{1}{2}(2bx+e)}}{\sqrt{c}}\right)}{bd^{3/2}\log(f)}$$

```
[Out] f^(b*x+a-e)/b/d/ln(f)-f^(a-3/2*e)*arctan(f^(1/2*e+b*x)*d^(1/2)/c^(1/2))*c^(
1/2)/b/d^(3/2)/ln(f)
```

Rubi [A] time = 0.07, antiderivative size = 88, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used = {2248, 321, 205}

$$\frac{f^{\frac{1}{2}(2a-3e)+\frac{1}{2}(2bx+e)}}{bd\log(f)}-\frac{\sqrt{c}\,f^{a-\frac{3e}{2}}\tan^{-1}\left(\frac{\sqrt{d}\,f^{\frac{1}{2}(2bx+e)}}{\sqrt{c}}\right)}{bd^{3/2}\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + 3*b*x)/(c + d*f^(e + 2*b*x)),x]
```

```
[Out] f^((2*a - 3*e)/2 + (e + 2*b*x)/2)/(b*d*Log[f]) - (Sqrt[c]*f^(a - (3*e)/2)*A
rcTan[(Sqrt[d]*f^((e + 2*b*x)/2))/Sqrt[c]])/(b*d^(3/2)*Log[f])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2248

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(g*h*Log[G])/(d*e*Lo
g[F])]}, Dist[(Denominator[m]*G^(f*h - (c*g*h)/d))/(d*e*Log[F]), Subst[Int[
```

```
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^((e*(c + d*x))/De
nominator[m])], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int \frac{f^{a+3bx}}{c+df^{e+2bx}}\,dx = \frac{f^{a-\frac{3e}{2}}\,\text{Subst}\left(\int \frac{x^2}{c+dx^2}\,dx, x, f^{\frac{1}{2}(e+2bx)}\right)}{b\log(f)}$$
$$= \frac{f^{\frac{1}{2}(2a-3e)+\frac{1}{2}(e+2bx)}}{bd\log(f)} - \frac{\left(cf^{a-\frac{3e}{2}}\right)\text{Subst}\left(\int \frac{1}{c+dx^2}\,dx, x, f^{\frac{1}{2}(e+2bx)}\right)}{bd\log(f)}$$
$$= \frac{f^{\frac{1}{2}(2a-3e)+\frac{1}{2}(e+2bx)}}{bd\log(f)} - \frac{\sqrt{c}\,f^{a-\frac{3e}{2}}\tan^{-1}\left(\frac{\sqrt{d}\,f^{\frac{1}{2}(e+2bx)}}{\sqrt{c}}\right)}{bd^{3/2}\log(f)}$$

Mathematica [A] time = 0.07, size = 67, normalized size = 0.76

$$\frac{f^a\left(\frac{f^{bx-e}}{d} - \frac{\sqrt{c}\,f^{-3e/2}\tan^{-1}\left(\frac{\sqrt{d}\,f^{bx+\frac{e}{2}}}{\sqrt{c}}\right)}{d^{3/2}}\right)}{b\log(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + 3*b*x)/(c + d*f^(e + 2*b*x)),x]
```

```
[Out] (f^a*(f^(-e + b*x)/d - (Sqrt[c]*ArcTan[(Sqrt[d]*f^(e/2 + b*x))/Sqrt[c]])/(d
^(3/2)*f^((3*e)/2))))/(b*Log[f])
```

fricas [A] time = 0.44, size = 166, normalized size = 1.89

$$\left[\frac{f^{a-\frac{3}{2}e}\sqrt{-\frac{c}{d}}\log\left(-\frac{2df^{bx+\frac{1}{2}e}\sqrt{-\frac{c}{d}}-df^{2bx+e}+c}{df^{2bx+e}+c}\right)+2f^{bx+\frac{1}{2}e}f^{a-\frac{3}{2}e}}{2bd\log(f)}, -\frac{f^{a-\frac{3}{2}e}\sqrt{\frac{c}{d}}\arctan\left(\frac{df^{bx+\frac{1}{2}e}\sqrt{\frac{c}{d}}}{c}\right)-f^{bx+\frac{1}{2}e}f^{a-\frac{3}{2}e}}{bd\log(f)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(3*b*x+a)/(c+d*f^(2*b*x+e)),x, algorithm="fricas")
```

```
[Out] [1/2*(f^(a - 3/2*e)*sqrt(-c/d)*log(-(2*d*f^(b*x + 1/2*e)*sqrt(-c/d) - d*f^(
2*b*x + e) + c)/(d*f^(2*b*x + e) + c)) + 2*f^(b*x + 1/2*e)*f^(a - 3/2*e))/(
b*d*log(f)), -(f^(a - 3/2*e)*sqrt(c/d)*arctan(d*f^(b*x + 1/2*e)*sqrt(c/d)/c
) - f^(b*x + 1/2*e)*f^(a - 3/2*e))/(b*d*log(f))]
```

giac [A] time = 0.36, size = 77, normalized size = 0.88

$$-f^{a}\left(\frac{c\arctan\left(\frac{df^{bx}f^{e}}{\sqrt{cdf^{e}}}\right)}{\sqrt{cdf^{e}}\,bdf^{e}\log(f)}-\frac{f^{bx}}{bdf^{e}\log(f)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(3*b*x+a)/(c+d*f^(2*b*x+e)),x, algorithm="giac")
```

```
[Out] -f^a*(c*arctan(d*f^(b*x)*f^e/sqrt(c*d*f^e))/(sqrt(c*d*f^e)*b*d*f^e*log(f))
- f^(b*x)/(b*d*f^e*log(f)))
```

maple [B] time = 0.10, size = 171, normalized size = 1.94

$$\frac{f^{\frac{2a}{3}}f^{-e}f^{bx+\frac{a}{3}}}{bd\ln(f)}+\frac{\sqrt{-cd}\;f^{a}f^{-\frac{3e}{2}}\ln\left(-\frac{\sqrt{-cd}\;f^{\frac{a}{3}}f^{-\frac{e}{2}}}{d}+f^{bx+\frac{a}{3}}\right)}{2b\,d^{2}\ln(f)}-\frac{\sqrt{-cd}\;f^{a}f^{-\frac{3e}{2}}\ln\left(\frac{\sqrt{-cd}\;f^{\frac{a}{3}}f^{-\frac{e}{2}}}{d}+f^{bx+\frac{a}{3}}\right)}{2b\,d^{2}\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(3*b*x+a)/(c+d*f^(2*b*x+e)),x)
```

```
[Out] 1/(f^(1/2*e))^2/(f^(-1/3*a))^2/d/ln(f)/b*f^(b*x+1/3*a)+1/2/d^2*(-c*d)^(1/2)
/b/(f^(-1/3*a))^3/(f^(1/2*e))^3/ln(f)*ln(f^(b*x+1/3*a)-1/(f^(1/2*e))/(f^(-1
/3*a))/d*(-c*d)^(1/2))-1/2/d^2*(-c*d)^(1/2)/b/(f^(-1/3*a))^3/(f^(1/2*e))^3/
ln(f)*ln(f^(b*x+1/3*a)+1/(f^(1/2*e))/(f^(-1/3*a))/d*(-c*d)^(1/2))
```

maxima [A] time = 1.00, size = 76, normalized size = 0.86

$$-\frac{cf^{a-e}\arctan\left(\frac{df^{bx+e}}{\sqrt{cd}\,f^{\frac{1}{2}e}}\right)}{\sqrt{cd}\,bdf^{\frac{1}{2}e}\log(f)}+\frac{f^{bx+a-e}}{bd\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(3*b*x+a)/(c+d*f^(2*b*x+e)),x, algorithm="maxima")
```

```
[Out] -c*f^(a - e)*arctan(d*f^(b*x + e)/(sqrt(c*d)*f^(1/2*e)))/(sqrt(c*d)*b*d*f^(
1/2*e)*log(f)) + f^(b*x + a - e)/(b*d*log(f))
```

mupad [B] time = 3.55, size = 66, normalized size = 0.75

$$-\frac{f^a\,\mathrm{e}^{-\frac{3\,e\,\ln(f)}{2}}\,\left(c\,\mathrm{atan}\left(\frac{d\,f^{b\,x}\,\mathrm{e}^{\frac{e\,\ln(f)}{2}}}{\sqrt{c\,d}}\right)-f^{b\,x}\,\mathrm{e}^{\frac{e\,\ln(f)}{2}}\,\sqrt{c\,d}\right)}{b\,d\,\ln(f)\,\sqrt{c\,d}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + 3*b*x)/(c + d*f^(e + 2*b*x)),x)
```

```
[Out] -(f^a*exp(-(3*e*log(f))/2)*(c*atan((d*f^(b*x)*exp((e*log(f))/2))/(c*d)^(1/2
)) - f^(b*x)*exp((e*log(f))/2)*(c*d)^(1/2)))/(b*d*log(f)*(c*d)^(1/2))
```

sympy [A] time = 1.35, size = 110, normalized size = 1.25

$$\operatorname{RootSum}\left(4z^2b^2d^3e^{3e\log(f)}\log(f)^2+ce^{2a\log(f)},\left(i\mapsto i\log\left(-2ibde^{-\frac{2a\log(f)}{3}}e^{e\log(f)}\log(f)+e^{\frac{(a+3bx)\log(f)}{3}}\right)\right)\right)+\frac{\left(\left\{\begin{matrix}x\\ \frac{e^{b}}{b}\end{matrix}\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(3*b*x+a)/(c+d*f**(2*b*x+e)),x)
```

```
[Out] RootSum(4*_z**2*b**2*d**3*exp(3*e*log(f))*log(f)**2 + c*exp(2*a*log(f)), La
mbda(_i, _i*log(-2*_i*b*d*exp(-2*a*log(f)/3)*exp(e*log(f))*log(f) + exp((a
+ 3*b*x)*log(f)/3)))) + Piecewise((x, Eq(b, 0) | Eq(f, 1)), (exp(b*x*log(f)
)/(b*log(f)), True))*exp(a*log(f))*exp(-e*log(f))/d
```

3.36 $\int \frac{f^{a+4bx}}{c+df^{e+2bx}}\,dx$

Optimal. Leaf size=61

$$\frac{f^{a+2bx-e}}{2bd\log(f)}-\frac{cf^{a-2e}\log\left(df^{2bx+e}+c\right)}{2bd^2\log(f)}$$

```
[Out] 1/2*f^(2*b*x+a-e)/b/d/ln(f)-1/2*c*f^(a-2*e)*ln(c+d*f^(2*b*x+e))/b/d^2/ln(f)
```

Rubi [A] time = 0.06, antiderivative size = 61, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087, Rules used = {2248, 43}

$$\frac{f^{a+2bx-e}}{2bd\log(f)}-\frac{cf^{a-2e}\log\left(df^{2bx+e}+c\right)}{2bd^2\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + 4*b*x)/(c + d*f^(e + 2*b*x)),x]
```

```
[Out] f^(a - e + 2*b*x)/(2*b*d*Log[f]) - (c*f^(a - 2*e)*Log[c + d*f^(e + 2*b*x)])
/(2*b*d^2*Log[f])
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2248

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(g*h*Log[G])/(d*e*Lo
g[F])]}, Dist[(Denominator[m]*G^(f*h - (c*g*h)/d))/(d*e*Log[F]), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^((e*(c + d*x))/De
nominator[m])], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int \frac{f^{a+4bx}}{c+df^{e+2bx}}\,dx = \frac{f^{a-2e}\,\text{Subst}\left(\int \frac{x}{c+dx}\,dx, x, f^{e+2bx}\right)}{2b\log(f)}$$
$$= \frac{f^{a-2e}\,\text{Subst}\left(\int \left(\frac{1}{d}-\frac{c}{d(c+dx)}\right)dx, x, f^{e+2bx}\right)}{2b\log(f)}$$
$$= \frac{f^{a-e+2bx}}{2bd\log(f)} - \frac{cf^{a-2e}\log\left(c+df^{e+2bx}\right)}{2bd^2\log(f)}$$

Mathematica [A] time = 0.05, size = 48, normalized size = 0.79

$$\frac{f^{a-2e}\left(df^{2bx+e}-c\log\left(df^{2bx+e}+c\right)\right)}{2bd^2\log(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + 4*b*x)/(c + d*f^(e + 2*b*x)),x]
```

```
[Out] (f^(a - 2*e)*(d*f^(e + 2*b*x) - c*Log[c + d*f^(e + 2*b*x)]))/(2*b*d^2*Log[f
])
```

fricas [A] time = 0.43, size = 53, normalized size = 0.87

$$\frac{df^{2\,bx+e}f^{a-2\,e}-cf^{a-2\,e}\log\left(df^{2\,bx+e}+c\right)}{2\,bd^2\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(4*b*x+a)/(c+d*f^(2*b*x+e)),x, algorithm="fricas")
```

```
[Out] 1/2*(d*f^(2*b*x + e)*f^(a - 2*e) - c*f^(a - 2*e)*log(d*f^(2*b*x + e) + c))/
(b*d^2*log(f))
```

giac [A] time = 0.29, size = 66, normalized size = 1.08

$$\frac{1}{2}\,f^a\left(\frac{f^{2\,bx}}{bdf^e\log(f)}-\frac{c\log\left(\left|df^{2\,bx}f^e+c\right|\right)}{bd^2f^{2\,e}\log(f)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(4*b*x+a)/(c+d*f^(2*b*x+e)),x, algorithm="giac")
```

```
[Out] 1/2*f^a*(f^(2*b*x)/(b*d*f^e*log(f)) - c*log(abs(d*f^(2*b*x)*f^e + c))/(b*d^
2*f^(2*e)*log(f)))
```

maple [A] time = 0.04, size = 76, normalized size = 1.25

$$-\frac{c\,f^{a} f^{-2e} \ln\left(d\,\mathrm{e}^{(2bx+e)\ln(f)}+c\right)}{2b\,d^{2}\ln(f)}+\frac{f^{a} f^{-2e} \mathrm{e}^{(2bx+e)\ln(f)}}{2bd\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(4*b*x+a)/(c+d*f^(2*b*x+e)),x)
```

```
[Out] 1/2/(f^e)^2/ln(f)/b/d*(f^(1/2*a))^2*exp((2*b*x+e)*ln(f))-1/2/ln(f)/b/d^2*c/
(f^e)^2*(f^(1/2*a))^2*ln(c+d*exp((2*b*x+e)*ln(f)))
```

maxima [A] time = 0.45, size = 65, normalized size = 1.07

$$-\frac{cf^{a-2\,e}\log\left(df^{2\,bx+e}+c\right)}{2\,bd^{2}\log(f)}+\frac{\left(df^{2\,bx+e}+c\right)f^{a-2\,e}}{2\,bd^{2}\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(4*b*x+a)/(c+d*f^(2*b*x+e)),x, algorithm="maxima")
```

```
[Out] -1/2*c*f^(a - 2*e)*log(d*f^(2*b*x + e) + c)/(b*d^2*log(f)) + 1/2*(d*f^(2*b*
x + e) + c)*f^(a - 2*e)/(b*d^2*log(f))
```

mupad [B] time = 3.54, size = 47, normalized size = 0.77

$$-\frac{f^{a-2\,e}\,\left(\frac{c\,\ln\left(c+d\,f^{e+2\,b\,x}\right)}{2}-\frac{d\,f^{e+2\,b\,x}}{2}\right)}{b\,d^2\,\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + 4*b*x)/(c + d*f^(e + 2*b*x)),x)
```

```
[Out] -(f^(a - 2*e)*((c*log(c + d*f^(e + 2*b*x)))/2 - (d*f^(e + 2*b*x))/2))/(b*d^
2*log(f))
```

sympy [A] time = 1.19, size = 92, normalized size = 1.51

$$\frac{\left(\begin{cases} x & \text{for}\: b = 0 \vee f = 1 \\ \frac{e^{2bx\log{(f)}}}{2b\log{(f)}} & \text{otherwise} \end{cases}\right) e^{a\log{(f)}} e^{-e\log{(f)}}}{d} - \frac{ce^{(a-2e)\log{(f)}}\log{\left(\frac{ce^{\frac{a\log{(f)}}{2}}e^{-e\log{(f)}}}{d} + \sqrt{e^{(a+4bx)\log{(f)}}} \right)}}{2bd^{2}\log{(f)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(4*b*x+a)/(c+d*f**(2*b*x+e)),x)
```

```
[Out] Piecewise((x, Eq(b, 0) | Eq(f, 1)), (exp(2*b*x*log(f))/(2*b*log(f)), True))
*exp(a*log(f))*exp(-e*log(f))/d - c*exp((a - 2*e)*log(f))*log(c*exp(a*log(f
)/2)*exp(-e*log(f))/d + sqrt(exp((a + 4*b*x)*log(f))))/(2*b*d**2*log(f))
```

3.37 $\int \frac{f^{a+5bx}}{c+df^{e+2bx}}\,dx$

Optimal. Leaf size=127

$$\frac{c^{3/2}f^{a-\frac{5e}{2}}\tan^{-1}\left(\frac{\sqrt{d}\,f^{\frac{1}{2}(2bx+e)}}{\sqrt{c}}\right)}{bd^{5/2}\log(f)}-\frac{cf^{\frac{1}{2}(2a-5e)+\frac{1}{2}(2bx+e)}}{bd^2\log(f)}+\frac{f^{\frac{1}{2}(2a-5e)+\frac{3}{2}(2bx+e)}}{3bd\log(f)}$$

```
[Out] -c*f^(b*x+a-2*e)/b/d^2/ln(f)+1/3*f^(3*b*x+a-e)/b/d/ln(f)+c^(3/2)*f^(a-5/2*e
)*arctan(f^(1/2*e+b*x)*d^(1/2)/c^(1/2))/b/d^(5/2)/ln(f)
```

Rubi [A] time = 0.08, antiderivative size = 127, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used = {2248, 302, 205}

$$\frac{c^{3/2}f^{a-\frac{5e}{2}}\tan^{-1}\left(\frac{\sqrt{d}\,f^{\frac{1}{2}(2bx+e)}}{\sqrt{c}}\right)}{bd^{5/2}\log(f)}-\frac{cf^{\frac{1}{2}(2a-5e)+\frac{1}{2}(2bx+e)}}{bd^2\log(f)}+\frac{f^{\frac{1}{2}(2a-5e)+\frac{3}{2}(2bx+e)}}{3bd\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + 5*b*x)/(c + d*f^(e + 2*b*x)),x]
```

```
[Out] -((c*f^((2*a - 5*e)/2 + (e + 2*b*x)/2))/(b*d^2*Log[f])) + f^((2*a - 5*e)/2
+ (3*(e + 2*b*x))/2)/(3*b*d*Log[f]) + (c^(3/2)*f^(a - (5*e)/2)*ArcTan[(Sqrt
[d]*f^((e + 2*b*x)/2))/Sqrt[c]])/(b*d^(5/2)*Log[f])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 302

```
Int[(x_)^(m_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Int[PolynomialDivide[x
^m, a + b*x^n, x], x] /; FreeQ[{a, b}, x] && IGtQ[m, 0] && IGtQ[n, 0] && Gt
Q[m, 2*n - 1]
```

Rule 2248

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(g*h*Log[G])/(d*e*Lo
g[F])]}, Dist[(Denominator[m]*G^(f*h - (c*g*h)/d))/(d*e*Log[F]), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^((e*(c + d*x))/De
```

```
nominator[m])], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{f^{a+5bx}}{c+df^{e+2bx}}\,dx &= \frac{f^{a-\frac{5e}{2}}\operatorname{Subst}\left(\int \frac{x^4}{c+dx^2}\,dx, x, f^{\frac{1}{2}(e+2bx)}\right)}{b\log(f)}\\
&= \frac{f^{a-\frac{5e}{2}}\operatorname{Subst}\left(\int \left(-\frac{c}{d^2}+\frac{x^2}{d}+\frac{c^2}{d^2(c+dx^2)}\right)dx, x, f^{\frac{1}{2}(e+2bx)}\right)}{b\log(f)}\\
&= -\frac{cf^{\frac{1}{2}(2a-5e)+\frac{1}{2}(e+2bx)}}{bd^2\log(f)}+\frac{f^{\frac{1}{2}(2a-5e)+\frac{3}{2}(e+2bx)}}{3bd\log(f)}+\frac{\left(c^2f^{a-\frac{5e}{2}}\right)\operatorname{Subst}\left(\int \frac{1}{c+dx^2}\,dx, x, f^{\frac{1}{2}(e+2bx)}\right)}{bd^2\log(f)}\\
&= -\frac{cf^{\frac{1}{2}(2a-5e)+\frac{1}{2}(e+2bx)}}{bd^2\log(f)}+\frac{f^{\frac{1}{2}(2a-5e)+\frac{3}{2}(e+2bx)}}{3bd\log(f)}+\frac{c^{3/2}f^{a-\frac{5e}{2}}\tan^{-1}\left(\frac{\sqrt{d}\,f^{\frac{1}{2}(e+2bx)}}{\sqrt{c}}\right)}{bd^{5/2}\log(f)}
\end{aligned}$$

Mathematica [A] time = 0.07, size = 86, normalized size = 0.68

$$\frac{3c^{3/2}f^{a-\frac{5e}{2}}\tan^{-1}\left(\frac{\sqrt{d}\,f^{bx+\frac{e}{2}}}{\sqrt{c}}\right)+\sqrt{d}\,f^{a+bx-2e}\left(df^{2bx+e}-3c\right)}{3bd^{5/2}\log(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + 5*b*x)/(c + d*f^(e + 2*b*x)),x]
```

```
[Out] (Sqrt[d]*f^(a - 2*e + b*x)*(-3*c + d*f^(e + 2*b*x)) + 3*c^(3/2)*f^(a - (5*e
)/2)*ArcTan[(Sqrt[d]*f^(e/2 + b*x))/Sqrt[c]])/(3*b*d^(5/2)*Log[f])
```

fricas [A] time = 0.45, size = 211, normalized size = 1.66

$$\left[\frac{3\,cf^{a-\frac{5}{2}\,e}\sqrt{-\frac{c}{d}}\,\log\left(\frac{2\,df^{bx+\frac{1}{2}\,e}\sqrt{-\frac{c}{d}}+df^{2\,bx+e}-c}{df^{2\,bx+e}+c}\right)+2\,df^{3\,bx+\frac{3}{2}\,e}f^{a-\frac{5}{2}\,e}-6\,cf^{bx+\frac{1}{2}\,e}f^{a-\frac{5}{2}\,e}}{6\,bd^2\log(f)}, \frac{3\,cf^{a-\frac{5}{2}\,e}\sqrt{\frac{c}{d}}\,\arctan\left(\frac{df^{bx+\frac{1}{2}\,e}\sqrt{\frac{c}{d}}}{c}\right.}{3\,b}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(5*b*x+a)/(c+d*f^(2*b*x+e)),x, algorithm="fricas")
```

```
[Out] [1/6*(3*c*f^(a - 5/2*e)*sqrt(-c/d)*log((2*d*f^(b*x + 1/2*e)*sqrt(-c/d) + d*
f^(2*b*x + e) - c)/(d*f^(2*b*x + e) + c)) + 2*d*f^(3*b*x + 3/2*e)*f^(a - 5/
2*e) - 6*c*f^(b*x + 1/2*e)*f^(a - 5/2*e))/(b*d^2*log(f)), 1/3*(3*c*f^(a - 5
/2*e)*sqrt(c/d)*arctan(d*f^(b*x + 1/2*e)*sqrt(c/d)/c) + d*f^(3*b*x + 3/2*e)
*f^(a - 5/2*e) - 3*c*f^(b*x + 1/2*e)*f^(a - 5/2*e))/(b*d^2*log(f))]
```

giac [A] time = 0.32, size = 122, normalized size = 0.96

$$\frac{1}{3} f^a \left(\frac{3 c^2 \arctan\left(\frac{d f^{bx} f^e}{\sqrt{c d f^e}}\right)}{\sqrt{c d f^e}\, b d^2 f^{2e} \log(f)} + \frac{b^2 d^2 f^{3bx} f^{2e} \log(f)^2 - 3 b^2 c d f^{bx} f^e \log(f)^2}{b^3 d^3 f^{3e} \log(f)^3} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(5*b*x+a)/(c+d*f^(2*b*x+e)),x, algorithm="giac")
```

```
[Out] 1/3*f^a*(3*c^2*arctan(d*f^(b*x)*f^e/sqrt(c*d*f^e))/(sqrt(c*d*f^e)*b*d^2*f^(
2*e)*log(f)) + (b^2*d^2*f^(3*b*x)*f^(2*e)*log(f)^2 - 3*b^2*c*d*f^(b*x)*f^e*
log(f)^2)/(b^3*d^3*f^(3*e)*log(f)^3))
```

maple [B] time = 0.10, size = 212, normalized size = 1.67

$$-\frac{c f^{\frac{4a}{5}} f^{-2e} f^{bx+\frac{a}{5}}}{b d^2 \ln(f)} + \frac{f^{\frac{2a}{5}} f^{-e} f^{3bx+\frac{3a}{5}}}{3bd \ln(f)} - \frac{\sqrt{-cd}\; c f^a f^{-\frac{5e}{2}} \ln\left(-\frac{\sqrt{-cd}\; f^{\frac{a}{5}} f^{-\frac{e}{2}}}{d} + f^{bx+\frac{a}{5}}\right)}{2b d^3 \ln(f)} + \frac{\sqrt{-cd}\; c f^a f^{-\frac{5e}{2}} \ln\left(\frac{\sqrt{-cd}\; f^{\frac{a}{5}} f^{-\frac{e}{2}}}{d} + f\right.}{2b d^3 \ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(5*b*x+a)/(c+d*f^(2*b*x+e)),x)
```

```
[Out] 1/3/(f^(1/2*e))^2/(f^(-1/5*a))^2/d/ln(f)/b*(f^(b*x+1/5*a))^3-c/(f^(1/2*e))^
4/(f^(-1/5*a))^4/d^2/ln(f)/b*f^(b*x+1/5*a)+1/2/d^3*(-c*d)^(1/2)*c/b/(f^(-1/
5*a))^5/(f^(1/2*e))^5/ln(f)*ln(f^(b*x+1/5*a)+1/(f^(1/2*e))/(f^(-1/5*a))/d*(
-c*d)^(1/2))-1/2/d^3*(-c*d)^(1/2)*c/b/(f^(-1/5*a))^5/(f^(1/2*e))^5/ln(f)*ln
(f^(b*x+1/5*a)-1/(f^(1/2*e))/(f^(-1/5*a))/d*(-c*d)^(1/2))
```

maxima [A] time = 0.97, size = 97, normalized size = 0.76

$$\frac{c^2 f^{a-2e} \arctan\left(\frac{d f^{bx+e}}{\sqrt{cd}\, f^{\frac{1}{2}e}}\right)}{\sqrt{cd}\, b d^2 f^{\frac{1}{2}e} \log(f)} + \frac{d f^{3bx+a+e} - 3 c f^{bx+a}}{3 b d^2 f^{2e} \log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(5*b*x+a)/(c+d*f^(2*b*x+e)),x, algorithm="maxima")
```

```
[Out] c^2*f^(a - 2*e)*arctan(d*f^(b*x + e)/(sqrt(c*d)*f^(1/2*e)))/(sqrt(c*d)*b*d^
2*f^(1/2*e)*log(f)) + 1/3*(d*f^(3*b*x + a + e) - 3*c*f^(b*x + a))/(b*d^2*f^
(2*e)*log(f))
```

mupad [B] time = 3.56, size = 102, normalized size = 0.80

$$\frac{f^a\,f^{3\,b\,x}}{3\,b\,d\,f^e\,\ln(f)}-\frac{c\,f^a\,f^{b\,x}}{b\,d^2\,f^{2\,e}\,\ln(f)}+\frac{c^2\,f^a\,\mathrm{e}^{-\frac{5\,e\,\ln(f)}{2}}\,\mathrm{atan}\left(\frac{d\,f^{b\,x}\,\mathrm{e}^{\frac{e\,\ln(f)}{2}}}{\sqrt{c\,d}}\right)}{b\,d^2\,\ln(f)\,\sqrt{c\,d}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + 5*b*x)/(c + d*f^(e + 2*b*x)),x)
```

```
[Out] (f^a*f^(3*b*x))/(3*b*d*f^e*log(f)) - (c*f^a*f^(b*x))/(b*d^2*f^(2*e)*log(f))
 + (c^2*f^a*exp(-(5*e*log(f))/2)*atan((d*f^(b*x)*exp((e*log(f))/2))/(c*d)^(
1/2)))/(b*d^2*log(f)*(c*d)^(1/2))
```

sympy [A] time = 1.67, size = 185, normalized size = 1.46

$$\operatorname{RootSum}\left(4z^2b^2d^5e^{5e\log(f)}\log(f)^2+c^3e^{2a\log(f)},\left(i\mapsto i\log\left(\frac{2ibd^2e^{-\frac{4a\log(f)}{5}}e^{2e\log(f)}\log(f)}{c}+e^{\frac{(a+5bx)\log(f)}{5}}\right)\right)\right)+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(5*b*x+a)/(c+d*f**(2*b*x+e)),x)
```

```
[Out] RootSum(4*_z**2*b**2*d**5*exp(5*e*log(f))*log(f)**2 + c**3*exp(2*a*log(f)),
 Lambda(_i, _i*log(2*_i*b*d**2*exp(-4*a*log(f)/5)*exp(2*e*log(f))*log(f)/c
+ exp((a + 5*b*x)*log(f)/5)))) + Piecewise((x*(-c + d), Eq(b, 0) & Eq(f, 1)
), (x*(-c*exp(a*log(f)) + d*exp(a*log(f))*exp(e*log(f))), Eq(b, 0)), (x*(-c
 + d), Eq(f, 1)), (-c*exp(a*log(f))*exp(b*x*log(f))/(b*log(f)) + d*exp(a*lo
g(f))*exp(e*log(f))*exp(3*b*x*log(f))/(3*b*log(f)), True))*exp(-2*e*log(f))
/d**2
```

3.38 $\int \frac{e^x}{1+e^{2x}} \, dx$

Optimal. Leaf size=4

$$\tan^{-1}(e^x)$$

```
[Out] arctan(exp(x))
```

Rubi [A] time = 0.02, antiderivative size = 4, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2249, 203}

$$\tan^{-1}(e^x)$$

Antiderivative was successfully verified.

```
[In] Int[E^x/(1 + E^(2*x)),x]
```

```
[Out] ArcTan[E^x]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned} \int \frac{e^x}{1+e^{2x}} \, dx &= \text{Subst}\left(\int \frac{1}{1+x^2} \, dx, x, e^x\right) \\ &= \tan^{-1}(e^x) \end{aligned}$$

Mathematica [A] time = 0.00, size = 4, normalized size = 1.00

$$\tan^{-1}(e^x)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x/(1 + E^(2*x)),x]
[Out] ArcTan[E^x]
```

fricas [A] time = 0.47, size = 3, normalized size = 0.75

$$\arctan(e^x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1+exp(2*x)),x, algorithm="fricas")
[Out] arctan(e^x)
```

giac [A] time = 0.32, size = 3, normalized size = 0.75

$$\arctan(e^x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1+exp(2*x)),x, algorithm="giac")
[Out] arctan(e^x)
```

maple [A] time = 0.01, size = 4, normalized size = 1.00

$$\arctan(\mathrm{e}^x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(1+exp(2*x)),x)
[Out] arctan(exp(x))
```

maxima [A] time = 0.97, size = 3, normalized size = 0.75

$$\arctan(e^x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1+exp(2*x)),x, algorithm="maxima")
[Out] arctan(e^x)
```

mupad [B] time = 3.47, size = 3, normalized size = 0.75

$$\mathrm{atan}(\mathrm{e}^x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(exp(2*x) + 1),x)
[Out] atan(exp(x))
```

sympy **[B]** time = 0.11, size = 15, normalized size = 3.75

$$\text{RootSum}\left(4z^2 + 1, \left(i \mapsto i \log\left(2i + e^x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1+exp(2*x)),x)
[Out] RootSum(4*_z**2 + 1, Lambda(_i, _i*log(2*_i + exp(x))))
```

3.39 $\int \frac{e^x}{1-e^{2x}} dx$

Optimal. Leaf size=4

$$\tanh^{-1}(e^x)$$

```
[Out] arctanh(exp(x))
```

Rubi [A] time = 0.02, antiderivative size = 4, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {2249, 206}

$$\tanh^{-1}(e^x)$$

Antiderivative was successfully verified.

```
[In] Int[E^x/(1 - E^(2*x)),x]
```

```
[Out] ArcTanh[E^x]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{e^x}{1-e^{2x}} dx &= \text{Subst}\left(\int \frac{1}{1-x^2} dx, x, e^x\right)\\ &= \tanh^{-1}(e^x)\end{aligned}$$

Mathematica [A] time = 0.00, size = 4, normalized size = 1.00

$$\tanh^{-1}(e^x)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x/(1 - E^(2*x)),x]
```

```
[Out] ArcTanh[E^x]
```

fricas [B] time = 0.44, size = 15, normalized size = 3.75

$$\frac{1}{2} \log\left(e^{x} + 1\right) - \frac{1}{2} \log\left(e^{x} - 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1-exp(2*x)),x, algorithm="fricas")
```

```
[Out] 1/2*log(e^x + 1) - 1/2*log(e^x - 1)
```

giac [B] time = 0.33, size = 16, normalized size = 4.00

$$\frac{1}{2} \log\left(e^{x} + 1\right) - \frac{1}{2} \log\left(|e^{x} - 1|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1-exp(2*x)),x, algorithm="giac")
```

```
[Out] 1/2*log(e^x + 1) - 1/2*log(abs(e^x - 1))
```

maple [A] time = 0.01, size = 4, normalized size = 1.00

$$\operatorname{arctanh}\left(\mathrm{e}^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(1-exp(2*x)),x)
```

```
[Out] arctanh(exp(x))
```

maxima [B] time = 0.44, size = 15, normalized size = 3.75

$$\frac{1}{2} \log\left(e^{x} + 1\right) - \frac{1}{2} \log\left(e^{x} - 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1-exp(2*x)),x, algorithm="maxima")
```

```
[Out] 1/2*log(e^x + 1) - 1/2*log(e^x - 1)
```

mupad [B] time = 0.13, size = 15, normalized size = 3.75

$$\frac{\ln\left(\mathrm{e}^{x}+1\right)}{2}-\frac{\ln\left(\mathrm{e}^{x}-1\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-exp(x)/(exp(2*x) - 1),x)
```

```
[Out] log(exp(x) + 1)/2 - log(exp(x) - 1)/2
```

sympy [B] time = 0.11, size = 15, normalized size = 3.75

$$-\frac{\log\left(e^{x}-1\right)}{2}+\frac{\log\left(e^{x}+1\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1-exp(2*x)),x)
```

```
[Out] -log(exp(x) - 1)/2 + log(exp(x) + 1)/2
```

3.40 $\int \frac{e^x x}{1-e^{2x}}\,dx$

Optimal. Leaf size=27

$$\frac{\text{Li}_2\left(-e^x\right)}{2}-\frac{\text{Li}_2\left(e^x\right)}{2}+x\tanh^{-1}\left(e^x\right)$$

```
[Out] x*arctanh(exp(x))+1/2*polylog(2,-exp(x))-1/2*polylog(2,exp(x))
```

Rubi [A] time = 0.06, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 5, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.312, Rules used = {2249, 206, 2245, 2282, 5912}

$$\frac{1}{2}\text{PolyLog}\left(2,-e^x\right)-\frac{1}{2}\text{PolyLog}\left(2,e^x\right)+x\tanh^{-1}\left(e^x\right)$$

Antiderivative was successfully verified.

```
[In] Int[(E^x*x)/(1 - E^(2*x)),x]
```

```
[Out] x*ArcTanh[E^x] + PolyLog[2, -E^x]/2 - PolyLog[2, E^x]/2
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2245

```
Int[(F_)^((e_.)*((c_.) + (d_.)*(x_)))*((a_.) + (b_.)*(F_)^(v_))^(p_)*(x_)^(
m_.), x_Symbol] :> With[{u = IntHide[F^(e*(c + d*x))*(a + b*F^v)^p, x]}, Di
st[x^m, u, x] - Dist[m, Int[x^(m - 1)*u, x], x]] /; FreeQ[{F, a, b, c, d, e
}, x] && EqQ[v, 2*e*(c + d*x)] && GtQ[m, 0] && ILtQ[p, 0]
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 5912

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x
] + (-Simp[(b*PolyLog[2, -(c*x)])/2, x] + Simp[(b*PolyLog[2, c*x])/2, x]) /
; FreeQ[{a, b, c}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{e^x x}{1-e^{2x}}\,dx &= x\tanh^{-1}(e^x) - \int \tanh^{-1}(e^x)\,dx\\ &= x\tanh^{-1}(e^x) - \text{Subst}\left(\int \frac{\tanh^{-1}(x)}{x}\,dx, x, e^x\right)\\ &= x\tanh^{-1}(e^x) + \frac{\text{Li}_2(-e^x)}{2} - \frac{\text{Li}_2(e^x)}{2}\end{aligned}$$

Mathematica [A] time = 0.04, size = 45, normalized size = 1.67

$$\frac{\text{Li}_2(-e^x)}{2} - \frac{\text{Li}_2(e^x)}{2} - \frac{1}{2}x\log(1-e^x) + \frac{1}{2}x\log(e^x+1)$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^x*x)/(1 - E^(2*x)),x]
```

```
[Out] -1/2*(x*Log[1 - E^x]) + (x*Log[1 + E^x])/2 + PolyLog[2, -E^x]/2 - PolyLog[2
, E^x]/2
```

fricas [A] time = 0.44, size = 31, normalized size = 1.15

$$\frac{1}{2}x\log(e^x+1) - \frac{1}{2}x\log(-e^x+1) + \frac{1}{2}\text{Li}_2(-e^x) - \frac{1}{2}\text{Li}_2(e^x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*x/(1-exp(2*x)),x, algorithm="fricas")
```

```
[Out] 1/2*x*log(e^x + 1) - 1/2*x*log(-e^x + 1) + 1/2*dilog(-e^x) - 1/2*dilog(e^x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int -\frac{xe^x}{e^{(2x)} - 1}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*x/(1-exp(2*x)),x, algorithm="giac")
[Out] integrate(-x*e^x/(e^(2*x) - 1), x)
```

maple [A] time = 0.02, size = 34, normalized size = 1.26

$$-\frac{x\ln(-e^x + 1)}{2} + \frac{x\ln(e^x + 1)}{2} + \frac{\mathrm{polylog}(2, -e^x)}{2} - \frac{\mathrm{polylog}(2, e^x)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*x/(1-exp(2*x)),x)
[Out] 1/2*x*ln(1+exp(x))+1/2*polylog(2,-exp(x))-1/2*x*ln(1-exp(x))-1/2*polylog(2,
exp(x))
```

maxima [A] time = 0.45, size = 31, normalized size = 1.15

$$\frac{1}{2}x\log(e^x + 1) - \frac{1}{2}x\log(-e^x + 1) + \frac{1}{2}\mathrm{Li}_2(-e^x) - \frac{1}{2}\mathrm{Li}_2(e^x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*x/(1-exp(2*x)),x, algorithm="maxima")
[Out] 1/2*x*log(e^x + 1) - 1/2*x*log(-e^x + 1) + 1/2*dilog(-e^x) - 1/2*dilog(e^x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.04

$$-\int \frac{x\,e^x}{e^{2x} - 1}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-(x*exp(x))/(exp(2*x) - 1),x)
[Out] -int((x*exp(x))/(exp(2*x) - 1), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\int \frac{xe^x}{e^{2x} - 1}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*x/(1-exp(2*x)),x)
```

```
[Out] -Integral(x*exp(x)/(exp(2*x) - 1), x)
```

3.41 $\int \frac{e^x x^2}{1-e^{2x}} \, dx$

Optimal. Leaf size=40

$$x\text{Li}_2\left(-e^x\right) - x\text{Li}_2\left(e^x\right) - \text{Li}_3\left(-e^x\right) + \text{Li}_3\left(e^x\right) + x^2 \tanh^{-1}\left(e^x\right)$$

```
[Out] x^2*arctanh(exp(x))+x*polylog(2,-exp(x))-x*polylog(2,exp(x))-polylog(3,-exp
(x))+polylog(3,exp(x))
```

Rubi [A] time = 0.10, antiderivative size = 40, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.389, Rules used = {2249, 206, 2245, 6213, 2531, 2282, 6589}

$$x\text{PolyLog}\left(2,-e^x\right) - x\text{PolyLog}\left(2,e^x\right) - \text{PolyLog}\left(3,-e^x\right) + \text{PolyLog}\left(3,e^x\right) + x^2 \tanh^{-1}\left(e^x\right)$$

Antiderivative was successfully verified.

```
[In] Int[(E^x*x^2)/(1 - E^(2*x)),x]
```

```
[Out] x^2*ArcTanh[E^x] + x*PolyLog[2, -E^x] - x*PolyLog[2, E^x] - PolyLog[3, -E^x
] + PolyLog[3, E^x]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2245

```
Int[(F_)^((e_.)*((c_.) + (d_.)*(x_)))*((a_.) + (b_.)*(F_)^(v_))^(p_)*(x_)^(
m_.), x_Symbol] :> With[{u = IntHide[F^(e*(c + d*x))*(a + b*F^v)^p, x]}, Di
st[x^m, u, x] - Dist[m, Int[x^(m - 1)*u, x], x]] /; FreeQ[{F, a, b, c, d, e
}, x] && EqQ[v, 2*e*(c + d*x)] && GtQ[m, 0] && ILtQ[p, 0]
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 6213

```
Int[ArcTanh[(a_.) + (b_.)*(f_)^((c_.) + (d_.)*(x_))]*(x_)^(m_.), x_Symbol]
:> Dist[1/2, Int[x^m*Log[1 + a + b*f^(c + d*x)], x], x] - Dist[1/2, Int[x^m
*Log[1 - a - b*f^(c + d*x)], x], x] /; FreeQ[{a, b, c, d, f}, x] && IGtQ[m,
 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$
\begin{aligned}
\int \frac{e^x x^2}{1-e^{2x}}\,dx &= x^2\tanh^{-1}(e^x) - 2\int x\tanh^{-1}(e^x)\,dx \\
&= x^2\tanh^{-1}(e^x) + \int x\log(1-e^x)\,dx - \int x\log(1+e^x)\,dx \\
&= x^2\tanh^{-1}(e^x) + x\mathrm{Li}_2(-e^x) - x\mathrm{Li}_2(e^x) - \int \mathrm{Li}_2(-e^x)\,dx + \int \mathrm{Li}_2(e^x)\,dx \\
&= x^2\tanh^{-1}(e^x) + x\mathrm{Li}_2(-e^x) - x\mathrm{Li}_2(e^x) - \mathrm{Subst}\left(\int \frac{\mathrm{Li}_2(-x)}{x}\,dx, x, e^x\right) + \mathrm{Subst}\left(\int \frac{\mathrm{Li}_2(x)}{x}\,dx, x, e^x\right) \\
&= x^2\tanh^{-1}(e^x) + x\mathrm{Li}_2(-e^x) - x\mathrm{Li}_2(e^x) - \mathrm{Li}_3(-e^x) + \mathrm{Li}_3(e^x)
\end{aligned}
$$

Mathematica [A] time = 0.04, size = 60, normalized size = 1.50

$$x\mathrm{Li}_2(-e^x) - x\mathrm{Li}_2(e^x) - \mathrm{Li}_3(-e^x) + \mathrm{Li}_3(e^x) - \frac{1}{2}x^2\log(1-e^x) + \frac{1}{2}x^2\log(e^x+1)$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^x*x^2)/(1 - E^(2*x)),x]
```

```
[Out] -1/2*(x^2*Log[1 - E^x]) + (x^2*Log[1 + E^x])/2 + x*PolyLog[2, -E^x] - x*Pol
yLog[2, E^x] - PolyLog[3, -E^x] + PolyLog[3, E^x]
```

fricas [C] time = 0.44, size = 48, normalized size = 1.20

$$\frac{1}{2}x^2\log\left(e^x+1\right)-\frac{1}{2}x^2\log\left(-e^x+1\right)+x\mathrm{Li}_2\left(-e^x\right)-x\mathrm{Li}_2\left(e^x\right)-\mathrm{polylog}\left(3,-e^x\right)+\mathrm{polylog}\left(3,e^x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*x^2/(1-exp(2*x)),x, algorithm="fricas")
```

```
[Out] 1/2*x^2*log(e^x + 1) - 1/2*x^2*log(-e^x + 1) + x*dilog(-e^x) - x*dilog(e^x)
 - polylog(3, -e^x) + polylog(3, e^x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int -\frac{x^2e^x}{e^{(2x)}-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*x^2/(1-exp(2*x)),x, algorithm="giac")
```

```
[Out] integrate(-x^2*e^x/(e^(2*x) - 1), x)
```

maple [A] time = 0.02, size = 51, normalized size = 1.28

$$-\frac{x^2\ln\left(-\mathrm{e}^x+1\right)}{2}+\frac{x^2\ln\left(\mathrm{e}^x+1\right)}{2}+x\,\mathrm{polylog}\left(2,-\mathrm{e}^x\right)-x\,\mathrm{polylog}\left(2,\mathrm{e}^x\right)-\mathrm{polylog}\left(3,-\mathrm{e}^x\right)+\mathrm{polylog}\left(3,\mathrm{e}^x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*x^2/(1-exp(2*x)),x)
```

```
[Out] 1/2*x^2*ln(exp(x)+1)+x*polylog(2,-exp(x))-polylog(3,-exp(x))-1/2*x^2*ln(-ex
p(x)+1)-x*polylog(2,exp(x))+polylog(3,exp(x))
```

maxima [A] time = 0.45, size = 48, normalized size = 1.20

$$\frac{1}{2}x^2\log\left(e^x+1\right)-\frac{1}{2}x^2\log\left(-e^x+1\right)+x\mathrm{Li}_2\left(-e^x\right)-x\mathrm{Li}_2\left(e^x\right)-\mathrm{Li}_3(-e^x)+\mathrm{Li}_3(e^x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*x^2/(1-exp(2*x)),x, algorithm="maxima")
```

```
[Out] 1/2*x^2*log(e^x + 1) - 1/2*x^2*log(-e^x + 1) + x*dilog(-e^x) - x*dilog(e^x)
 - polylog(3, -e^x) + polylog(3, e^x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$-\int \frac{x^2\,\mathrm{e}^x}{\mathrm{e}^{2\,x}-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-(x^2*exp(x))/(exp(2*x) - 1),x)
```

```
[Out] -int((x^2*exp(x))/(exp(2*x) - 1), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\int \frac{x^2 e^x}{e^{2x}-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*x**2/(1-exp(2*x)),x)
```

```
[Out] -Integral(x**2*exp(x)/(exp(2*x) - 1), x)
```

3.42 $\int \frac{e^x x^3}{1-e^{2x}}\,dx$

Optimal. Leaf size=69

$$\frac{3}{2}x^2\text{Li}_2\left(-e^x\right)-\frac{3}{2}x^2\text{Li}_2\left(e^x\right)-3x\text{Li}_3\left(-e^x\right)+3x\text{Li}_3\left(e^x\right)+3\text{Li}_4\left(-e^x\right)-3\text{Li}_4\left(e^x\right)+x^3\tanh^{-1}\left(e^x\right)$$

```
[Out] x^3*arctanh(exp(x))+3/2*x^2*polylog(2,-exp(x))-3/2*x^2*polylog(2,exp(x))-3*
x*polylog(3,-exp(x))+3*x*polylog(3,exp(x))+3*polylog(4,-exp(x))-3*polylog(4
,exp(x))
```

Rubi [A] time = 0.12, antiderivative size = 69, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 8, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.444, Rules used = {2249, 206, 2245, 6213, 2531, 6609, 2282, 6589}

$$\frac{3}{2}x^2\text{PolyLog}\left(2,-e^x\right)-\frac{3}{2}x^2\text{PolyLog}\left(2,e^x\right)-3x\text{PolyLog}\left(3,-e^x\right)+3x\text{PolyLog}\left(3,e^x\right)+3\text{PolyLog}\left(4,-e^x\right)-3\text{PolyL}$$

Antiderivative was successfully verified.

```
[In] Int[(E^x*x^3)/(1 - E^(2*x)),x]
```

```
[Out] x^3*ArcTanh[E^x] + (3*x^2*PolyLog[2, -E^x])/2 - (3*x^2*PolyLog[2, E^x])/2 -
 3*x*PolyLog[3, -E^x] + 3*x*PolyLog[3, E^x] + 3*PolyLog[4, -E^x] - 3*PolyLo
g[4, E^x]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2245

```
Int[(F_)^((e_.)*((c_.) + (d_.)*(x_)))*((a_.) + (b_.)*(F_)^(v_))^(p_)*(x_)^(
m_.), x_Symbol] :> With[{u = IntHide[F^(e*(c + d*x))*(a + b*F^v)^p, x]}, Di
st[x^m, u, x] - Dist[m, Int[x^(m - 1)*u, x], x]] /; FreeQ[{F, a, b, c, d, e
}, x] && EqQ[v, 2*e*(c + d*x)] && GtQ[m, 0] && ILtQ[p, 0]
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
```

```
 f, g, h, p}, x]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 6213

```
Int[ArcTanh[(a_.) + (b_.)*(f_)^((c_.) + (d_.)*(x_))]*(x_)^(m_.), x_Symbol]
:> Dist[1/2, Int[x^m*Log[1 + a + b*f^(c + d*x)], x], x] - Dist[1/2, Int[x^m
*Log[1 - a - b*f^(c + d*x)], x], x] /; FreeQ[{a, b, c, d, f}, x] && IGtQ[m,
 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\begin{aligned}\int \frac{e^x x^3}{1-e^{2x}}\,dx &= x^3\tanh^{-1}(e^x) - 3\int x^2\tanh^{-1}(e^x)\,dx\\ &= x^3\tanh^{-1}(e^x) + \frac{3}{2}\int x^2\log(1-e^x)\,dx - \frac{3}{2}\int x^2\log(1+e^x)\,dx\\ &= x^3\tanh^{-1}(e^x) + \frac{3}{2}x^2\text{Li}_2(-e^x) - \frac{3}{2}x^2\text{Li}_2(e^x) - 3\int x\text{Li}_2(-e^x)\,dx + 3\int x\text{Li}_2(e^x)\,dx\\ &= x^3\tanh^{-1}(e^x) + \frac{3}{2}x^2\text{Li}_2(-e^x) - \frac{3}{2}x^2\text{Li}_2(e^x) - 3x\text{Li}_3(-e^x) + 3x\text{Li}_3(e^x) + 3\int \text{Li}_3(-e^x)\,dx - 3\int\\ &= x^3\tanh^{-1}(e^x) + \frac{3}{2}x^2\text{Li}_2(-e^x) - \frac{3}{2}x^2\text{Li}_2(e^x) - 3x\text{Li}_3(-e^x) + 3x\text{Li}_3(e^x) + 3\,\text{Subst}\left(\int \frac{\text{Li}_3(-x)}{x}\,dx\right.\\ &= x^3\tanh^{-1}(e^x) + \frac{3}{2}x^2\text{Li}_2(-e^x) - \frac{3}{2}x^2\text{Li}_2(e^x) - 3x\text{Li}_3(-e^x) + 3x\text{Li}_3(e^x) + 3\text{Li}_4(-e^x) - 3\text{Li}_4(e^x)\end{aligned}$$

Mathematica [A] time = 0.05, size = 89, normalized size = 1.29

$$\frac{3}{2}x^2\text{Li}_2(-e^x) - \frac{3}{2}x^2\text{Li}_2(e^x) - 3x\text{Li}_3(-e^x) + 3x\text{Li}_3(e^x) + 3\text{Li}_4(-e^x) - 3\text{Li}_4(e^x) - \frac{1}{2}x^3\log(1-e^x) + \frac{1}{2}x^3\log(e^x+1)$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^x*x^3)/(1 - E^(2*x)),x]
```

```
[Out] -1/2*(x^3*Log[1 - E^x]) + (x^3*Log[1 + E^x])/2 + (3*x^2*PolyLog[2, -E^x])/2
 - (3*x^2*PolyLog[2, E^x])/2 - 3*x*PolyLog[3, -E^x] + 3*x*PolyLog[3, E^x] +
 3*PolyLog[4, -E^x] - 3*PolyLog[4, E^x]
```

fricas [C] time = 0.45, size = 71, normalized size = 1.03

$$\frac{1}{2}x^3\log(e^x+1) - \frac{1}{2}x^3\log(-e^x+1) + \frac{3}{2}x^2\text{Li}_2(-e^x) - \frac{3}{2}x^2\text{Li}_2(e^x) - 3x\text{polylog}(3,-e^x) + 3x\text{polylog}(3,e^x) + 3\,\text{poly}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*x^3/(1-exp(2*x)),x, algorithm="fricas")
```

```
[Out] 1/2*x^3*log(e^x + 1) - 1/2*x^3*log(-e^x + 1) + 3/2*x^2*dilog(-e^x) - 3/2*x^
2*dilog(e^x) - 3*x*polylog(3, -e^x) + 3*x*polylog(3, e^x) + 3*polylog(4, -e
^x) - 3*polylog(4, e^x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int -\frac{x^3 e^x}{e^{(2x)}-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*x^3/(1-exp(2*x)),x, algorithm="giac")
```

```
[Out] integrate(-x^3*e^x/(e^(2*x) - 1), x)
```

maple [A] time = 0.02, size = 74, normalized size = 1.07

$$-\frac{x^3 \ln(-e^x+1)}{2}+\frac{x^3 \ln(e^x+1)}{2}+\frac{3x^2 \operatorname{polylog}(2,-e^x)}{2}-\frac{3x^2 \operatorname{polylog}(2,e^x)}{2}-3x \operatorname{polylog}(3,-e^x)+3x \operatorname{polylog}(3,e$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*x^3/(1-exp(2*x)),x)
```

```
[Out] 1/2*x^3*ln(exp(x)+1)+3/2*x^2*polylog(2,-exp(x))-3*x*polylog(3,-exp(x))+3*po
lylog(4,-exp(x))-1/2*x^3*ln(-exp(x)+1)-3/2*x^2*polylog(2,exp(x))+3*x*polylo
g(3,exp(x))-3*polylog(4,exp(x))
```

maxima [A] time = 0.47, size = 71, normalized size = 1.03

$$\frac{1}{2}x^3 \log(e^x+1)-\frac{1}{2}x^3 \log(-e^x+1)+\frac{3}{2}x^2\mathrm{Li}_2(-e^x)-\frac{3}{2}x^2\mathrm{Li}_2(e^x)-3x\mathrm{Li}_3(-e^x)+3x\mathrm{Li}_3(e^x)+3\mathrm{Li}_4(-e^x)-3\mathrm{Li}_4(e^x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*x^3/(1-exp(2*x)),x, algorithm="maxima")
```

```
[Out] 1/2*x^3*log(e^x + 1) - 1/2*x^3*log(-e^x + 1) + 3/2*x^2*dilog(-e^x) - 3/2*x^
2*dilog(e^x) - 3*x*polylog(3, -e^x) + 3*x*polylog(3, e^x) + 3*polylog(4, -e
^x) - 3*polylog(4, e^x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$-\int \frac{x^3 e^x}{e^{2x}-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-(x^3*exp(x))/(exp(2*x) - 1),x)
```

```
[Out] -int((x^3*exp(x))/(exp(2*x) - 1), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\int \frac{x^3 e^x}{e^{2x}-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*x**3/(1-exp(2*x)),x)
[Out] -Integral(x**3*exp(x)/(exp(2*x) - 1), x)
```

3.43 $\int \frac{f^x}{a+bf^{2x}}\,dx$

Optimal. Leaf size=30

$$\frac{\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)}$$

```
[Out] arctan(f^x*b^(1/2)/a^(1/2))/ln(f)/a^(1/2)/b^(1/2)
```

Rubi [A] time = 0.03, antiderivative size = 30, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {2249, 205}

$$\frac{\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^x/(a + b*f^(2*x)),x]
```

```
[Out] ArcTan[(Sqrt[b]*f^x)/Sqrt[a]]/(Sqrt[a]*Sqrt[b]*Log[f])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\int \frac{f^x}{a+bf^{2x}}\,dx = \frac{\text{Subst}\left(\int \frac{1}{a+bx^2}\,dx, x, f^x\right)}{\log(f)}$$
$$= \frac{\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)}$$

Mathematica [A] time = 0.01, size = 30, normalized size = 1.00

$$\frac{\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^x/(a + b*f^(2*x)),x]
[Out] ArcTan[(Sqrt[b]*f^x)/Sqrt[a]]/(Sqrt[a]*Sqrt[b]*Log[f])
```

fricas [A] time = 0.45, size = 86, normalized size = 2.87

$$\left[-\frac{\sqrt{-ab}\,\log\left(\frac{bf^{2x}-2\,\sqrt{-ab}\,f^x-a}{bf^{2x}+a}\right)}{2\,ab\log(f)}, -\frac{\sqrt{ab}\,\arctan\left(\frac{\sqrt{ab}}{bf^x}\right)}{ab\log(f)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^x/(a+b*f^(2*x)),x, algorithm="fricas")
[Out] [-1/2*sqrt(-a*b)*log((b*f^(2*x) - 2*sqrt(-a*b)*f^x - a)/(b*f^(2*x) + a))/(a
*b*log(f)), -sqrt(a*b)*arctan(sqrt(a*b)/(b*f^x))/(a*b*log(f))]
```

giac [A] time = 0.35, size = 21, normalized size = 0.70

$$\frac{\arctan\left(\frac{bf^x}{\sqrt{ab}}\right)}{\sqrt{ab}\,\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^x/(a+b*f^(2*x)),x, algorithm="giac")
[Out] arctan(b*f^x/sqrt(a*b))/(sqrt(a*b)*log(f))
```

maple [B] time = 0.04, size = 53, normalized size = 1.77

$$-\frac{\ln\left(-\frac{a}{\sqrt{-ab}}+f^{x}\right)}{2\sqrt{-ab}\,\ln\left(f\right)}+\frac{\ln\left(\frac{a}{\sqrt{-ab}}+f^{x}\right)}{2\sqrt{-ab}\,\ln\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^x/(a+b*f^(2*x)),x)
```

```
[Out] -1/2/(-a*b)^(1/2)/ln(f)*ln(f^x-1/(-a*b)^(1/2)*a)+1/2/(-a*b)^(1/2)/ln(f)*ln(
f^x+1/(-a*b)^(1/2)*a)
```

maxima [A] time = 1.01, size = 21, normalized size = 0.70

$$\frac{\arctan\left(\frac{bf^{x}}{\sqrt{ab}}\right)}{\sqrt{ab}\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^x/(a+b*f^(2*x)),x, algorithm="maxima")
```

```
[Out] arctan(b*f^x/sqrt(a*b))/(sqrt(a*b)*log(f))
```

mupad [B] time = 3.50, size = 21, normalized size = 0.70

$$\frac{\mathrm{atan}\left(\frac{b\,f^x}{\sqrt{a\,b}}\right)}{\ln\left(f\right)\,\sqrt{a\,b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^x/(a + b*f^(2*x)),x)
```

```
[Out] atan((b*f^x)/(a*b)^(1/2))/(log(f)*(a*b)^(1/2))
```

sympy [A] time = 0.18, size = 24, normalized size = 0.80

$$\frac{\operatorname{RootSum}{\left(4 z^{2} a b + 1, \left(i \mapsto i \log{\left(2 i a + f^{x} \right)} \right)\right)}}{\log{\left(f \right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**x/(a+b*f**(2*x)),x)
```

```
[Out] RootSum(4*_z**2*a*b + 1, Lambda(_i, _i*log(2*_i*a + f**x)))/log(f)
```

3.44 $\int \frac{f^x x}{a+bf^{2x}}\,dx$

Optimal. Leaf size=110

$$-\frac{i\mathrm{Li}_2\left(-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2\sqrt{a}\,\sqrt{b}\,\log^2(f)}+\frac{i\mathrm{Li}_2\left(\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2\sqrt{a}\,\sqrt{b}\,\log^2(f)}+\frac{x\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)}$$

```
[Out] x*arctan(f^x*b^(1/2)/a^(1/2))/ln(f)/a^(1/2)/b^(1/2)-1/2*I*polylog(2,-I*f^x*
b^(1/2)/a^(1/2))/ln(f)^2/a^(1/2)/b^(1/2)+1/2*I*polylog(2,I*f^x*b^(1/2)/a^(1
/2))/ln(f)^2/a^(1/2)/b^(1/2)
```

Rubi [A] time = 0.11, antiderivative size = 110, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 7, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.438, Rules used = {2249, 205, 2245, 12, 2282, 4848, 2391}

$$-\frac{i\mathrm{PolyLog}\left(2,-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2\sqrt{a}\,\sqrt{b}\,\log^2(f)}+\frac{i\mathrm{PolyLog}\left(2,\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2\sqrt{a}\,\sqrt{b}\,\log^2(f)}+\frac{x\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[(f^x*x)/(a + b*f^(2*x)),x]
```

```
[Out] (x*ArcTan[(Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Sqrt[b]*Log[f]) - ((I/2)*PolyLog
[2, ((-I)*Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Sqrt[b]*Log[f]^2) + ((I/2)*PolyLo
g[2, (I*Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Sqrt[b]*Log[f]^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2245

```
Int[(F_)^((e_.)*((c_.) + (d_.)*(x_)))*((a_.) + (b_.)*(F_)^(v_))^(p_)*(x_)^(
m_.), x_Symbol] :> With[{u = IntHide[F^(e*(c + d*x))*(a + b*F^v)^p, x]}, Di
st[x^m, u, x] - Dist[m, Int[x^(m - 1)*u, x], x]] /; FreeQ[{F, a, b, c, d, e
}, x] && EqQ[v, 2*e*(c + d*x)] && GtQ[m, 0] && ILtQ[p, 0]
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rubi steps

$$\int \frac{f^x x}{a+bf^{2x}}\,dx = \frac{x\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log(f)} - \int \frac{\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log(f)}\,dx$$

$$= \frac{x\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log(f)} - \frac{\int \tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)dx}{\sqrt{a}\sqrt{b}\log(f)}$$

$$= \frac{x\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log(f)} - \frac{\text{Subst}\left(\int \frac{\tan^{-1}\left(\frac{\sqrt{b}x}{\sqrt{a}}\right)}{x}dx, x, f^x\right)}{\sqrt{a}\sqrt{b}\log^2(f)}$$

$$= \frac{x\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log(f)} - \frac{i\,\text{Subst}\left(\int \frac{\log\left(1-\frac{i\sqrt{b}x}{\sqrt{a}}\right)}{x}dx, x, f^x\right)}{2\sqrt{a}\sqrt{b}\log^2(f)} + \frac{i\,\text{Subst}\left(\int \frac{\log\left(1+\frac{i\sqrt{b}x}{\sqrt{a}}\right)}{x}dx, x, f^x\right)}{2\sqrt{a}\sqrt{b}\log^2(f)}$$

$$= \frac{x\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log(f)} - \frac{i\text{Li}_2\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{2\sqrt{a}\sqrt{b}\log^2(f)} + \frac{i\text{Li}_2\left(\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{2\sqrt{a}\sqrt{b}\log^2(f)}$$

Mathematica [A] time = 0.07, size = 108, normalized size = 0.98

$$\frac{i\left(-\text{Li}_2\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right) + \text{Li}_2\left(\frac{i\sqrt{b}f^x}{\sqrt{a}}\right) + x\log(f)\left(\log\left(1-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right) - \log\left(1+\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)\right)\right)}{2\sqrt{a}\sqrt{b}\log^2(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f^x*x)/(a + b*f^(2*x)),x]
```

```
[Out] ((I/2)*(x*Log[f]*(Log[1 - (I*Sqrt[b]*f^x)/Sqrt[a]] - Log[1 + (I*Sqrt[b]*f^x
)/Sqrt[a]]) - PolyLog[2, ((-I)*Sqrt[b]*f^x)/Sqrt[a]] + PolyLog[2, (I*Sqrt[b
]*f^x)/Sqrt[a]]))/(Sqrt[a]*Sqrt[b]*Log[f]^2)
```

fricas [A] time = 0.45, size = 112, normalized size = 1.02

$$-\frac{x\sqrt{-\frac{b}{a}}\log\left(f^x\sqrt{-\frac{b}{a}}+1\right)\log(f) - x\sqrt{-\frac{b}{a}}\log\left(-f^x\sqrt{-\frac{b}{a}}+1\right)\log(f) - \sqrt{-\frac{b}{a}}\text{Li}_2\left(f^x\sqrt{-\frac{b}{a}}\right) + \sqrt{-\frac{b}{a}}\text{Li}_2\left(-f^x\sqrt{-\right.}{2b\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^x*x/(a+b*f^(2*x)),x, algorithm="fricas")
```

```
[Out] -1/2*(x*sqrt(-b/a)*log(f^x*sqrt(-b/a) + 1)*log(f) - x*sqrt(-b/a)*log(-f^x*s
qrt(-b/a) + 1)*log(f) - sqrt(-b/a)*dilog(f^x*sqrt(-b/a)) + sqrt(-b/a)*dilog
(-f^x*sqrt(-b/a)))/(b*log(f)^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^x x}{bf^{2x} + a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^x*x/(a+b*f^(2*x)),x, algorithm="giac")
```

```
[Out] integrate(f^x*x/(b*f^(2*x) + a), x)
```

maple [A] time = 0.06, size = 134, normalized size = 1.22

$$\frac{x \ln\left(\frac{-b f^{x}+\sqrt{-ab}}{\sqrt{-ab}}\right)}{2\sqrt{-ab}\, \ln(f)} - \frac{x \ln\left(\frac{b f^{x}+\sqrt{-ab}}{\sqrt{-ab}}\right)}{2\sqrt{-ab}\, \ln(f)} + \frac{\operatorname{dilog}\left(\frac{-b f^{x}+\sqrt{-ab}}{\sqrt{-ab}}\right)}{2\sqrt{-ab}\, \ln(f)^{2}} - \frac{\operatorname{dilog}\left(\frac{b f^{x}+\sqrt{-ab}}{\sqrt{-ab}}\right)}{2\sqrt{-ab}\, \ln(f)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^x*x/(a+b*f^(2*x)),x)
```

```
[Out] 1/2/ln(f)*x/(-a*b)^(1/2)*ln((-b*f^x+(-a*b)^(1/2))/(-a*b)^(1/2))-1/2/ln(f)*x
/(-a*b)^(1/2)*ln((b*f^x+(-a*b)^(1/2))/(-a*b)^(1/2))+1/2/ln(f)^2/(-a*b)^(1/2
)*dilog((-b*f^x+(-a*b)^(1/2))/(-a*b)^(1/2))-1/2/ln(f)^2/(-a*b)^(1/2)*dilog(
(b*f^x+(-a*b)^(1/2))/(-a*b)^(1/2))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^x x}{bf^{2x} + a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^x*x/(a+b*f^(2*x)),x, algorithm="maxima")
```

```
[Out] integrate(f^x*x/(b*f^(2*x) + a), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{f^x\, x}{a + b\, f^{2x}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f^x*x)/(a + b*f^(2*x)),x)
[Out] int((f^x*x)/(a + b*f^(2*x)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^x x}{a+bf^{2x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**x*x/(a+b*f**(2*x)),x)
[Out] Integral(f**x*x/(a + b*f**(2*x)), x)
```

3.45 $\int \frac{f^x x^2}{a+bf^{2x}} \, dx$

Optimal. Leaf size=184

$$\frac{i\text{Li}_3\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log^3(f)}-\frac{i\text{Li}_3\left(\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log^3(f)}-\frac{ix\text{Li}_2\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log^2(f)}+\frac{ix\text{Li}_2\left(\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log^2(f)}+\frac{x^2\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log(f)}$$

```
[Out] x^2*arctan(f^x*b^(1/2)/a^(1/2))/ln(f)/a^(1/2)/b^(1/2)-I*x*polylog(2,-I*f^x*
b^(1/2)/a^(1/2))/ln(f)^2/a^(1/2)/b^(1/2)+I*x*polylog(2,I*f^x*b^(1/2)/a^(1/2
))/ln(f)^2/a^(1/2)/b^(1/2)+I*polylog(3,-I*f^x*b^(1/2)/a^(1/2))/ln(f)^3/a^(1
/2)/b^(1/2)-I*polylog(3,I*f^x*b^(1/2)/a^(1/2))/ln(f)^3/a^(1/2)/b^(1/2)
```

Rubi [A] time = 0.18, antiderivative size = 184, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 8, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.444, Rules used = {2249, 205, 2245, 12, 5143, 2531, 2282, 6589}

$$-\frac{ix\text{PolyLog}\left(2,-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log^2(f)}+\frac{ix\text{PolyLog}\left(2,\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log^2(f)}+\frac{i\text{PolyLog}\left(3,-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log^3(f)}-\frac{i\text{PolyLog}\left(3,\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log^3(f)}+\frac{x^2\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[(f^x*x^2)/(a + b*f^(2*x)),x]
```

```
[Out] (x^2*ArcTan[(Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Sqrt[b]*Log[f]) - (I*x*PolyLog
[2, ((-I)*Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Sqrt[b]*Log[f]^2) + (I*x*PolyLog[
2, (I*Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Sqrt[b]*Log[f]^2) + (I*PolyLog[3, ((-
I)*Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Sqrt[b]*Log[f]^3) - (I*PolyLog[3, (I*Sqr
t[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Sqrt[b]*Log[f]^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2245

```
Int[(F_)^((e_.)*((c_.) + (d_.)*(x_)))*((a_.) + (b_.)*(F_)^(v_))^(p_)*(x_)^(
m_.), x_Symbol] :> With[{u = IntHide[F^(e*(c + d*x))*(a + b*F^v)^p, x]}, Di
```

```
st[x^m, u, x] - Dist[m, Int[x^(m - 1)*u, x], x]] /; FreeQ[{F, a, b, c, d, e
}, x] && EqQ[v, 2*e*(c + d*x)] && GtQ[m, 0] && ILtQ[p, 0]
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 5143

```
Int[ArcTan[(a_.) + (b_.)*(f_)^((c_.) + (d_.)*(x_))]*(x_)^(m_.), x_Symbol] :
> Dist[I/2, Int[x^m*Log[1 - I*a - I*b*f^(c + d*x)], x], x] - Dist[I/2, Int[
x^m*Log[1 + I*a + I*b*f^(c + d*x)], x], x] /; FreeQ[{a, b, c, d, f}, x] &&
IntegerQ[m] && m > 0
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{f^x x^2}{a+bf^{2x}}\,dx = \frac{x^2\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log(f)} - 2\int \frac{x\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log(f)}\,dx$$

$$= \frac{x^2\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log(f)} - \frac{2\int x\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)dx}{\sqrt{a}\sqrt{b}\log(f)}$$

$$= \frac{x^2\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log(f)} - \frac{i\int x\log\left(1-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)dx}{\sqrt{a}\sqrt{b}\log(f)} + \frac{i\int x\log\left(1+\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)dx}{\sqrt{a}\sqrt{b}\log(f)}$$

$$= \frac{x^2\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log(f)} - \frac{ix\text{Li}_2\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log^2(f)} + \frac{ix\text{Li}_2\left(\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log^2(f)} + \frac{i\int \text{Li}_2\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)dx}{\sqrt{a}\sqrt{b}\log^2(f)} - \frac{i\int \text{Li}_2\left(\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)d}{\sqrt{a}\sqrt{b}\log^2(f)}$$

$$= \frac{x^2\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log(f)} - \frac{ix\text{Li}_2\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log^2(f)} + \frac{ix\text{Li}_2\left(\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log^2(f)} + \frac{i\,\text{Subst}\left(\int \frac{\text{Li}_2\left(-\frac{i\sqrt{b}x}{\sqrt{a}}\right)}{x}dx, x, f^x\right)}{\sqrt{a}\sqrt{b}\log^3(f)} - \frac{i\,\text{Subs}}{}$$

$$= \frac{x^2\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log(f)} - \frac{ix\text{Li}_2\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log^2(f)} + \frac{ix\text{Li}_2\left(\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log^2(f)} + \frac{i\text{Li}_3\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log^3(f)} - \frac{i\text{Li}_3\left(\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log^3(f)}$$

Mathematica [A] time = 0.05, size = 168, normalized size = 0.91

$$\frac{i\left(2\text{Li}_3\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right) - 2\text{Li}_3\left(\frac{i\sqrt{b}f^x}{\sqrt{a}}\right) - 2x\log(f)\text{Li}_2\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right) + 2x\log(f)\text{Li}_2\left(\frac{i\sqrt{b}f^x}{\sqrt{a}}\right) + x^2\log^2(f)\log\left(1-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right) - x\right.}{2\sqrt{a}\sqrt{b}\log^3(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f^x*x^2)/(a + b*f^(2*x)),x]
```

```
[Out] ((I/2)*(x^2*Log[f]^2*Log[1 - (I*Sqrt[b]*f^x)/Sqrt[a]] - x^2*Log[f]^2*Log[1
+ (I*Sqrt[b]*f^x)/Sqrt[a]] - 2*x*Log[f]*PolyLog[2, ((-I)*Sqrt[b]*f^x)/Sqrt[
a]] + 2*x*Log[f]*PolyLog[2, (I*Sqrt[b]*f^x)/Sqrt[a]] + 2*PolyLog[3, ((-I)*S
qrt[b]*f^x)/Sqrt[a]] - 2*PolyLog[3, (I*Sqrt[b]*f^x)/Sqrt[a]]))/(Sqrt[a]*Sqr
t[b]*Log[f]^3)
```

fricas [C] time = 0.42, size = 176, normalized size = 0.96

$$-\frac{x^2\sqrt{-\frac{b}{a}}\log\left(f^x\sqrt{-\frac{b}{a}}+1\right)\log(f)^2 - x^2\sqrt{-\frac{b}{a}}\log\left(-f^x\sqrt{-\frac{b}{a}}+1\right)\log(f)^2 - 2x\sqrt{-\frac{b}{a}}\text{Li}_2\left(f^x\sqrt{-\frac{b}{a}}\right)\log(f) + 2x\sqrt{}}{2b\log(f)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^x*x^2/(a+b*f^(2*x)),x, algorithm="fricas")
```

```
[Out] -1/2*(x^2*sqrt(-b/a)*log(f^x*sqrt(-b/a) + 1)*log(f)^2 - x^2*sqrt(-b/a)*log(
-f^x*sqrt(-b/a) + 1)*log(f)^2 - 2*x*sqrt(-b/a)*dilog(f^x*sqrt(-b/a))*log(f)
 + 2*x*sqrt(-b/a)*dilog(-f^x*sqrt(-b/a))*log(f) + 2*sqrt(-b/a)*polylog(3, f
^x*sqrt(-b/a)) - 2*sqrt(-b/a)*polylog(3, -f^x*sqrt(-b/a)))/(b*log(f)^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^x x^2}{bf^{2x} + a} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^x*x^2/(a+b*f^(2*x)),x, algorithm="giac")
```

```
[Out] integrate(f^x*x^2/(b*f^(2*x) + a), x)
```

maple [F] time = 0.05, size = 0, normalized size = 0.00

$$\int \frac{x^2 f^x}{b\, f^{2x} + a} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^x*x^2/(a+b*f^(2*x)),x)
```

```
[Out] int(f^x*x^2/(a+b*f^(2*x)),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^x x^2}{bf^{2x} + a} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^x*x^2/(a+b*f^(2*x)),x, algorithm="maxima")
```

```
[Out] integrate(f^x*x^2/(b*f^(2*x) + a), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{f^x\, x^2}{a + b\, f^{2\,x}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f^x*x^2)/(a + b*f^(2*x)),x)
```

```
[Out] int((f^x*x^2)/(a + b*f^(2*x)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^x x^2}{a + b f^{2x}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**x*x**2/(a+b*f**(2*x)),x)
```

```
[Out] Integral(f**x*x**2/(a + b*f**(2*x)), x)
```

3.46 $\int \frac{f^x x^3}{a+bf^{2x}} dx$

Optimal. Leaf size=268

$$-\frac{3ix^2\text{Li}_2\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{2\sqrt{a}\sqrt{b}\log^2(f)}+\frac{3ix^2\text{Li}_2\left(\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{2\sqrt{a}\sqrt{b}\log^2(f)}-\frac{3i\text{Li}_4\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log^4(f)}+\frac{3i\text{Li}_4\left(\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log^4(f)}+\frac{3ix\text{Li}_3\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log^3(f)}-\frac{3ix\text{Li}_3\left(\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log^3(f)}+\frac{x^3}{\sqrt{}}$$

```
[Out] x^3*arctan(f^x*b^(1/2)/a^(1/2))/ln(f)/a^(1/2)/b^(1/2)-3/2*I*x^2*polylog(2,-
I*f^x*b^(1/2)/a^(1/2))/ln(f)^2/a^(1/2)/b^(1/2)+3/2*I*x^2*polylog(2,I*f^x*b^
(1/2)/a^(1/2))/ln(f)^2/a^(1/2)/b^(1/2)+3*I*x*polylog(3,-I*f^x*b^(1/2)/a^(1/
2))/ln(f)^3/a^(1/2)/b^(1/2)-3*I*x*polylog(3,I*f^x*b^(1/2)/a^(1/2))/ln(f)^3/
a^(1/2)/b^(1/2)-3*I*polylog(4,-I*f^x*b^(1/2)/a^(1/2))/ln(f)^4/a^(1/2)/b^(1/
2)+3*I*polylog(4,I*f^x*b^(1/2)/a^(1/2))/ln(f)^4/a^(1/2)/b^(1/2)
```

Rubi [A] time = 0.23, antiderivative size = 268, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 9, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {2249, 205, 2245, 12, 5143, 2531, 6609, 2282, 6589}

$$-\frac{3ix^2\text{PolyLog}\left(2,-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{2\sqrt{a}\sqrt{b}\log^2(f)}+\frac{3ix^2\text{PolyLog}\left(2,\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{2\sqrt{a}\sqrt{b}\log^2(f)}+\frac{3ix\text{PolyLog}\left(3,-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log^3(f)}-\frac{3ix\text{PolyLog}\left(3,\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log^3(f)}-\frac{3i\text{Poly}}{\sqrt{}}$$

Antiderivative was successfully verified.

```
[In] Int[(f^x*x^3)/(a + b*f^(2*x)),x]
```

```
[Out] (x^3*ArcTan[(Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Sqrt[b]*Log[f]) - (((3*I)/2)*x
^2*PolyLog[2, ((-I)*Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Sqrt[b]*Log[f]^2) + (((
3*I)/2)*x^2*PolyLog[2, (I*Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Sqrt[b]*Log[f]^2)
 + ((3*I)*x*PolyLog[3, ((-I)*Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Sqrt[b]*Log[f]
^3) - ((3*I)*x*PolyLog[3, (I*Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Sqrt[b]*Log[f]
^3) - ((3*I)*PolyLog[4, ((-I)*Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Sqrt[b]*Log[f
]^4) + ((3*I)*PolyLog[4, (I*Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Sqrt[b]*Log[f]^
4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2245

```
Int[(F_)^((e_.)*((c_.) + (d_.)*(x_)))*((a_.) + (b_.)*(F_)^(v_))^(p_)*(x_)^(
m_.), x_Symbol] :> With[{u = IntHide[F^(e*(c + d*x))*(a + b*F^v)^p, x]}, Di
st[x^m, u, x] - Dist[m, Int[x^(m - 1)*u, x], x]] /; FreeQ[{F, a, b, c, d, e
}, x] && EqQ[v, 2*e*(c + d*x)] && GtQ[m, 0] && ILtQ[p, 0]
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 5143

```
Int[ArcTan[(a_.) + (b_.)*(f_)^((c_.) + (d_.)*(x_))]*(x_)^(m_.), x_Symbol] :
> Dist[I/2, Int[x^m*Log[1 - I*a - I*b*f^(c + d*x)], x], x] - Dist[I/2, Int[
x^m*Log[1 + I*a + I*b*f^(c + d*x)], x], x] /; FreeQ[{a, b, c, d, f}, x] &&
IntegerQ[m] && m > 0
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\int \frac{f^x x^3}{a+bf^{2x}}\,dx = \frac{x^3\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log(f)} - 3\int \frac{x^2\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log(f)}\,dx$$

$$= \frac{x^3\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log(f)} - \frac{3\int x^2\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)dx}{\sqrt{a}\sqrt{b}\log(f)}$$

$$= \frac{x^3\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log(f)} - \frac{(3i)\int x^2\log\left(1-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)dx}{2\sqrt{a}\sqrt{b}\log(f)} + \frac{(3i)\int x^2\log\left(1+\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)dx}{2\sqrt{a}\sqrt{b}\log(f)}$$

$$= \frac{x^3\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log(f)} - \frac{3ix^2\text{Li}_2\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{2\sqrt{a}\sqrt{b}\log^2(f)} + \frac{3ix^2\text{Li}_2\left(\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{2\sqrt{a}\sqrt{b}\log^2(f)} + \frac{(3i)\int x\text{Li}_2\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)dx}{\sqrt{a}\sqrt{b}\log^2(f)} - \frac{(3i)\int x}{\sqrt{a}}$$

$$= \frac{x^3\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log(f)} - \frac{3ix^2\text{Li}_2\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{2\sqrt{a}\sqrt{b}\log^2(f)} + \frac{3ix^2\text{Li}_2\left(\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{2\sqrt{a}\sqrt{b}\log^2(f)} + \frac{3ix\text{Li}_3\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log^3(f)} - \frac{3ix\text{Li}_3\left(\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log^3(f)}$$

$$= \frac{x^3\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log(f)} - \frac{3ix^2\text{Li}_2\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{2\sqrt{a}\sqrt{b}\log^2(f)} + \frac{3ix^2\text{Li}_2\left(\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{2\sqrt{a}\sqrt{b}\log^2(f)} + \frac{3ix\text{Li}_3\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log^3(f)} - \frac{3ix\text{Li}_3\left(\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log^3(f)}$$

$$= \frac{x^3\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log(f)} - \frac{3ix^2\text{Li}_2\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{2\sqrt{a}\sqrt{b}\log^2(f)} + \frac{3ix^2\text{Li}_2\left(\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{2\sqrt{a}\sqrt{b}\log^2(f)} + \frac{3ix\text{Li}_3\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log^3(f)} - \frac{3ix\text{Li}_3\left(\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log^3(f)}$$

$$= \frac{x^3\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log(f)} - \frac{3ix^2\text{Li}_2\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{2\sqrt{a}\sqrt{b}\log^2(f)} + \frac{3ix^2\text{Li}_2\left(\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{2\sqrt{a}\sqrt{b}\log^2(f)} + \frac{3ix\text{Li}_3\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log^3(f)} - \frac{3ix\text{Li}_3\left(\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log^3(f)}$$

Mathematica [A] time = 0.05, size = 224, normalized size = 0.84

$$\frac{i\left(-3x^2\log^2(f)\text{Li}_2\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)+3x^2\log^2(f)\text{Li}_2\left(\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)-6\text{Li}_4\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)+6\text{Li}_4\left(\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)+6x\log(f)\text{Li}_3\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)\right.}{2\sqrt{a}\sqrt{b}\log^4(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f^x*x^3)/(a + b*f^(2*x)),x]
```

```
[Out] ((I/2)*(x^3*Log[f]^3*Log[1 - (I*Sqrt[b]*f^x)/Sqrt[a]] - x^3*Log[f]^3*Log[1
+ (I*Sqrt[b]*f^x)/Sqrt[a]] - 3*x^2*Log[f]^2*PolyLog[2, ((-I)*Sqrt[b]*f^x)/S
qrt[a]] + 3*x^2*Log[f]^2*PolyLog[2, (I*Sqrt[b]*f^x)/Sqrt[a]] + 6*x*Log[f]*P
olyLog[3, ((-I)*Sqrt[b]*f^x)/Sqrt[a]] - 6*x*Log[f]*PolyLog[3, (I*Sqrt[b]*f^
x)/Sqrt[a]] - 6*PolyLog[4, ((-I)*Sqrt[b]*f^x)/Sqrt[a]] + 6*PolyLog[4, (I*Sq
rt[b]*f^x)/Sqrt[a]]))/(Sqrt[a]*Sqrt[b]*Log[f]^4)
```

fricas [C] time = 0.46, size = 239, normalized size = 0.89

$$-\frac{x^3\sqrt{-\frac{b}{a}}\,\log\left(f^x\sqrt{-\frac{b}{a}}+1\right)\log(f)^3 - x^3\sqrt{-\frac{b}{a}}\,\log\left(-f^x\sqrt{-\frac{b}{a}}+1\right)\log(f)^3 - 3\,x^2\sqrt{-\frac{b}{a}}\,\mathrm{Li}_2\left(f^x\sqrt{-\frac{b}{a}}\right)\log(f)^2 + 3\,x}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^x*x^3/(a+b*f^(2*x)),x, algorithm="fricas")
```

```
[Out] -1/2*(x^3*sqrt(-b/a)*log(f^x*sqrt(-b/a) + 1)*log(f)^3 - x^3*sqrt(-b/a)*log(
-f^x*sqrt(-b/a) + 1)*log(f)^3 - 3*x^2*sqrt(-b/a)*dilog(f^x*sqrt(-b/a))*log(
f)^2 + 3*x^2*sqrt(-b/a)*dilog(-f^x*sqrt(-b/a))*log(f)^2 + 6*x*sqrt(-b/a)*lo
g(f)*polylog(3, f^x*sqrt(-b/a)) - 6*x*sqrt(-b/a)*log(f)*polylog(3, -f^x*sqr
t(-b/a)) - 6*sqrt(-b/a)*polylog(4, f^x*sqrt(-b/a)) + 6*sqrt(-b/a)*polylog(4
, -f^x*sqrt(-b/a)))/(b*log(f)^4)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^x x^3}{bf^{2x} + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^x*x^3/(a+b*f^(2*x)),x, algorithm="giac")
```

```
[Out] integrate(f^x*x^3/(b*f^(2*x) + a), x)
```

maple [F] time = 0.06, size = 0, normalized size = 0.00

$$\int \frac{x^3 f^x}{b\,f^{2x} + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^x*x^3/(b*f^(2*x)+a),x)
```

```
[Out] int(f^x*x^3/(b*f^(2*x)+a),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^x x^3}{bf^{2x} + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^x*x^3/(a+b*f^(2*x)),x, algorithm="maxima")
```

```
[Out] integrate(f^x*x^3/(b*f^(2*x) + a), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{f^x\,x^3}{a + b\,f^{2\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f^x*x^3)/(a + b*f^(2*x)),x)
```

```
[Out] int((f^x*x^3)/(a + b*f^(2*x)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^x x^3}{a + bf^{2x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**x*x**3/(a+b*f**(2*x)),x)
```

```
[Out] Integral(f**x*x**3/(a + b*f**(2*x)), x)
```

3.47 $\int \frac{f^x}{\left(a+bf^{2x}\right)^2}\,dx$

Optimal. Leaf size=59

$$\frac{\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log(f)}+\frac{f^x}{2a\log(f)\left(a+bf^{2x}\right)}$$

```
[Out] 1/2*f^x/a/(a+b*f^(2*x))/ln(f)+1/2*arctan(f^x*b^(1/2)/a^(1/2))/a^(3/2)/ln(f)
/b^(1/2)
```

Rubi [A] time = 0.04, antiderivative size = 59, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2249, 199, 205}

$$\frac{\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log(f)}+\frac{f^x}{2a\log(f)\left(a+bf^{2x}\right)}$$

Antiderivative was successfully verified.

```
[In] Int[f^x/(a + b*f^(2*x))^2,x]
```

```
[Out] f^x/(2*a*(a + b*f^(2*x))*Log[f]) + ArcTan[(Sqrt[b]*f^x)/Sqrt[a]]/(2*a^(3/2)
*Sqrt[b]*Log[f])
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
```

```
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\int \frac{f^x}{\left(a+bf^{2x}\right)^2}\,dx = \frac{\text{Subst}\left(\int \frac{1}{\left(a+bx^2\right)^2}\,dx, x, f^x\right)}{\log(f)}$$

$$= \frac{f^x}{2a\left(a+bf^{2x}\right)\log(f)} + \frac{\text{Subst}\left(\int \frac{1}{a+bx^2}\,dx, x, f^x\right)}{2a\log(f)}$$

$$= \frac{f^x}{2a\left(a+bf^{2x}\right)\log(f)} + \frac{\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log(f)}$$

Mathematica [A] time = 0.06, size = 53, normalized size = 0.90

$$\frac{\frac{\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{a^{3/2}\sqrt{b}} + \frac{f^x}{a^2+abf^{2x}}}{2\log(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^x/(a + b*f^(2*x))^2,x]
```

```
[Out] (f^x/(a^2 + a*b*f^(2*x)) + ArcTan[(Sqrt[b]*f^x)/Sqrt[a]]/(a^(3/2)*Sqrt[b]))
/(2*Log[f])
```

fricas [A] time = 0.44, size = 164, normalized size = 2.78

$$\left[\frac{2\,abf^x - \left(\sqrt{-ab}\,bf^{2\,x} + \sqrt{-ab}\,a\right)\log\left(\frac{bf^{2\,x} - 2\,\sqrt{-ab}\,f^x - a}{bf^{2\,x} + a}\right)}{4\left(a^2b^2f^{2\,x}\log(f) + a^3b\log(f)\right)}, \frac{abf^x - \left(\sqrt{ab}\,bf^{2\,x} + \sqrt{ab}\,a\right)\arctan\left(\frac{\sqrt{ab}}{bf^x}\right)}{2\left(a^2b^2f^{2\,x}\log(f) + a^3b\log(f)\right)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^x/(a+b*f^(2*x))^2,x, algorithm="fricas")
```

```
[Out] [1/4*(2*a*b*f^x - (sqrt(-a*b)*b*f^(2*x) + sqrt(-a*b)*a)*log((b*f^(2*x) - 2*
sqrt(-a*b)*f^x - a)/(b*f^(2*x) + a)))/(a^2*b^2*f^(2*x)*log(f) + a^3*b*log(f
```

```
)), 1/2*(a*b*f^x - (sqrt(a*b)*b*f^(2*x) + sqrt(a*b)*a)*arctan(sqrt(a*b)/(b*
f^x)))/(a^2*b^2*f^(2*x)*log(f) + a^3*b*log(f))]
```

giac [A] time = 0.30, size = 49, normalized size = 0.83

$$\frac{\arctan\left(\frac{bf^x}{\sqrt{ab}}\right)}{2\sqrt{ab}\,a\log(f)} + \frac{f^x}{2\left(bf^{2x}+a\right)a\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^x/(a+b*f^(2*x))^2,x, algorithm="giac")
```

```
[Out] 1/2*arctan(b*f^x/sqrt(a*b))/(sqrt(a*b)*a*log(f)) + 1/2*f^x/((b*f^(2*x) + a)
*a*log(f))
```

maple [A] time = 0.05, size = 82, normalized size = 1.39

$$\frac{f^x}{2\left(b\,f^{2x}+a\right)a\ln(f)} - \frac{\ln\left(-\frac{a}{\sqrt{-ab}}+f^x\right)}{4\sqrt{-ab}\;a\ln(f)} + \frac{\ln\left(\frac{a}{\sqrt{-ab}}+f^x\right)}{4\sqrt{-ab}\;a\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^x/(b*f^(2*x)+a)^2,x)
```

```
[Out] 1/2/a/ln(f)*f^x/(a+b*(f^x)^2)-1/4/(-a*b)^(1/2)/a/ln(f)*ln(-1/(-a*b)^(1/2)*a
+f^x)+1/4/(-a*b)^(1/2)/a/ln(f)*ln(1/(-a*b)^(1/2)*a+f^x)
```

maxima [A] time = 0.97, size = 49, normalized size = 0.83

$$\frac{f^x}{2\left(abf^{2x}+a^2\right)\log(f)} + \frac{\arctan\left(\frac{bf^x}{\sqrt{ab}}\right)}{2\sqrt{ab}\,a\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^x/(a+b*f^(2*x))^2,x, algorithm="maxima")
```

```
[Out] 1/2*f^x/((a*b*f^(2*x) + a^2)*log(f)) + 1/2*arctan(b*f^x/sqrt(a*b))/(sqrt(a*
b)*a*log(f))
```

mupad [B] time = 3.50, size = 49, normalized size = 0.83

$$\frac{f^x}{2\,a\,\ln(f)\,\left(a+b\,f^{2\,x}\right)} + \frac{\mathrm{atan}\left(\frac{b\,f^x}{\sqrt{a\,b}}\right)}{2\,a\,\ln(f)\,\sqrt{a\,b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^x/(a + b*f^(2*x))^2,x)
```

```
[Out] f^x/(2*a*log(f)*(a + b*f^(2*x))) + atan((b*f^x)/(a*b)^(1/2))/(2*a*log(f)*(a
*b)^(1/2))
```

sympy [A] time = 0.23, size = 53, normalized size = 0.90

$$\frac{f^x}{2a^2\log(f) + 2abf^{2x}\log(f)} + \frac{\mathrm{RootSum}\left(16z^2a^3b+1, \left(i \mapsto i\log\left(4ia^2+f^x\right)\right)\right)}{\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**x/(a+b*f**(2*x))**2,x)
```

```
[Out] f**x/(2*a**2*log(f) + 2*a*b*f**(2*x)*log(f)) + RootSum(16*_z**2*a**3*b + 1,
 Lambda(_i, _i*log(4*_i*a**2 + f**x)))/log(f)
```

3.48 $\int \frac{f^x x}{\left(a+bf^{2x}\right)^2}\,dx$

Optimal. Leaf size=172

$$-\frac{i\text{Li}_2\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{4a^{3/2}\sqrt{b}\log^2(f)}+\frac{i\text{Li}_2\left(\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{4a^{3/2}\sqrt{b}\log^2(f)}-\frac{\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log^2(f)}+\frac{x\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log(f)}+\frac{xf^x}{2a\log(f)\left(a+bf^{2x}\right)}$$

```
[Out] 1/2*f^x*x/a/(a+b*f^(2*x))/ln(f)-1/2*arctan(f^x*b^(1/2)/a^(1/2))/a^(3/2)/ln(
f)^2/b^(1/2)+1/2*x*arctan(f^x*b^(1/2)/a^(1/2))/a^(3/2)/ln(f)/b^(1/2)-1/4*I*
polylog(2,-I*f^x*b^(1/2)/a^(1/2))/a^(3/2)/ln(f)^2/b^(1/2)+1/4*I*polylog(2,I
*f^x*b^(1/2)/a^(1/2))/a^(3/2)/ln(f)^2/b^(1/2)
```

Rubi [A] time = 0.16, antiderivative size = 172, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.438, Rules used = {2249, 199, 205, 2245, 2282, 4848, 2391}

$$-\frac{i\text{PolyLog}\left(2,-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{4a^{3/2}\sqrt{b}\log^2(f)}+\frac{i\text{PolyLog}\left(2,\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{4a^{3/2}\sqrt{b}\log^2(f)}-\frac{\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log^2(f)}+\frac{x\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log(f)}+\frac{xf^x}{2a\log(f)\left(a+bf^{2x}\right)}$$

Antiderivative was successfully verified.

```
[In] Int[(f^x*x)/(a + b*f^(2*x))^2,x]
```

```
[Out] -ArcTan[(Sqrt[b]*f^x)/Sqrt[a]]/(2*a^(3/2)*Sqrt[b]*Log[f]^2) + (f^x*x)/(2*a*
(a + b*f^(2*x))*Log[f]) + (x*ArcTan[(Sqrt[b]*f^x)/Sqrt[a]])/(2*a^(3/2)*Sqrt
[b]*Log[f]) - ((I/4)*PolyLog[2, ((-I)*Sqrt[b]*f^x)/Sqrt[a]])/(a^(3/2)*Sqrt[
b]*Log[f]^2) + ((I/4)*PolyLog[2, (I*Sqrt[b]*f^x)/Sqrt[a]])/(a^(3/2)*Sqrt[b]
*Log[f]^2)
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2245

```
Int[(F_)^((e_.)*((c_.) + (d_.)*(x_)))*((a_.) + (b_.)*(F_)^(v_))^(p_)*(x_)^(
m_.), x_Symbol] :> With[{u = IntHide[F^(e*(c + d*x))*(a + b*F^v)^p, x]}, Di
st[x^m, u, x] - Dist[m, Int[x^(m - 1)*u, x], x]] /; FreeQ[{F, a, b, c, d, e
}, x] && EqQ[v, 2*e*(c + d*x)] && GtQ[m, 0] && ILtQ[p, 0]
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rubi steps

$$\int \frac{f^x x}{\left(a+bf^{2x}\right)^2}\,dx = \frac{f^x x}{2a\left(a+bf^{2x}\right)\log(f)} + \frac{x\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log(f)} - \int\left(\frac{f^x}{2a\left(a+bf^{2x}\right)\log(f)} + \frac{\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log(f)}\right)dx$$

$$= \frac{f^x x}{2a\left(a+bf^{2x}\right)\log(f)} + \frac{x\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log(f)} - \frac{\int \frac{f^x}{a+bf^{2x}}\,dx}{2a\log(f)} - \frac{\int \tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)dx}{2a^{3/2}\sqrt{b}\,\log(f)}$$

$$= \frac{f^x x}{2a\left(a+bf^{2x}\right)\log(f)} + \frac{x\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log(f)} - \frac{\text{Subst}\left(\int \frac{1}{a+bx^2}\,dx, x, f^x\right)}{2a\log^2(f)} - \frac{\text{Subst}\left(\int \frac{\tan^{-1}\left(\frac{\sqrt{b}x}{\sqrt{a}}\right)}{x}\,dx\right.}{2a^{3/2}\sqrt{b}\,\log^2(f}$$

$$= -\frac{\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log^2(f)} + \frac{f^x x}{2a\left(a+bf^{2x}\right)\log(f)} + \frac{x\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log(f)} - \frac{i\,\text{Subst}\left(\int \frac{\log\left(1-\frac{i\sqrt{b}x}{\sqrt{a}}\right)}{x}\,dx, x, f\right.}{4a^{3/2}\sqrt{b}\,\log^2(f)}$$

$$= -\frac{\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log^2(f)} + \frac{f^x x}{2a\left(a+bf^{2x}\right)\log(f)} + \frac{x\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\,\log(f)} - \frac{i\text{Li}_2\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{4a^{3/2}\sqrt{b}\,\log^2(f)} + \frac{i\text{Li}_2\left(\frac{i}{}\right.}{4a^{3/2}\sqrt{b}\,}$$

Mathematica [A] time = 0.15, size = 271, normalized size = 1.58

$$\frac{\frac{-\frac{i\text{Li}_2\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\log^2(f)}-\frac{ix\log\left(1+\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\log(f)}+\frac{ix^2}{2\sqrt{a}}}{2\sqrt{b}}+\frac{\frac{i\text{Li}_2\left(\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\log^2(f)}+\frac{ix\log\left(1-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\log(f)}-\frac{ix^2}{2\sqrt{a}}}{2\sqrt{b}}}{2a}+\frac{xf^x}{2a\log(f)\left(a+bf^{2x}\right)}-\frac{\left(\frac{bf^{2x}}{a}+1\right)\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{2\sqrt{a}\sqrt{b}\log^2(f)\left(a+bf^{2x}\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f^x*x)/(a + b*f^(2*x))^2,x]
```

```
[Out] -1/2*((1 + (b*f^(2*x))/a)*ArcTan[(Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Sqrt[b]*(
a + b*f^(2*x))*Log[f]^2) + (f^x*x)/(2*a*(a + b*f^(2*x))*Log[f]) + ((((I/2)*
x^2)/Sqrt[a] - (I*x*Log[1 + (I*Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Log[f]) - (I
*PolyLog[2, ((-I)*Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Log[f]^2))/(2*Sqrt[b]) +
(((-1/2*I)*x^2)/Sqrt[a] + (I*x*Log[1 - (I*Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*L
og[f]) + (I*PolyLog[2, (I*Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Log[f]^2))/(2*Sqr
t[b]))/(2*a)
```

fricas [B] time = 0.44, size = 311, normalized size = 1.81

$$\frac{2\,bf^{x}x\log(f) + \left(bf^{2\,x}\sqrt{-\frac{b}{a}} + a\sqrt{-\frac{b}{a}}\right)\mathrm{Li}_2\left(f^{x}\sqrt{-\frac{b}{a}}\right) - \left(bf^{2\,x}\sqrt{-\frac{b}{a}} + a\sqrt{-\frac{b}{a}}\right)\mathrm{Li}_2\left(-f^{x}\sqrt{-\frac{b}{a}}\right) - \left(bf^{2\,x}\sqrt{-\frac{b}{a}} + a\sqrt{\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^x*x/(a+b*f^(2*x))^2,x, algorithm="fricas")
```

```
[Out] 1/4*(2*b*f^x*x*log(f) + (b*f^(2*x)*sqrt(-b/a) + a*sqrt(-b/a))*dilog(f^x*sqr
t(-b/a)) - (b*f^(2*x)*sqrt(-b/a) + a*sqrt(-b/a))*dilog(-f^x*sqrt(-b/a)) - (
b*f^(2*x)*sqrt(-b/a) + a*sqrt(-b/a))*log(2*b*f^x + 2*a*sqrt(-b/a)) + (b*f^(
2*x)*sqrt(-b/a) + a*sqrt(-b/a))*log(2*b*f^x - 2*a*sqrt(-b/a)) - (b*f^(2*x)*
x*sqrt(-b/a)*log(f) + a*x*sqrt(-b/a)*log(f))*log(f^x*sqrt(-b/a) + 1) + (b*f
^(2*x)*x*sqrt(-b/a)*log(f) + a*x*sqrt(-b/a)*log(f))*log(-f^x*sqrt(-b/a) + 1
))/(a*b^2*f^(2*x)*log(f)^2 + a^2*b*log(f)^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{x}x}{\left(bf^{2\,x} + a\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^x*x/(a+b*f^(2*x))^2,x, algorithm="giac")
```

```
[Out] integrate(f^x*x/(b*f^(2*x) + a)^2, x)
```

maple [A] time = 0.07, size = 195, normalized size = 1.13

$$\frac{x\,f^{x}}{2\left(b\,f^{2x}+a\right)a\ln(f)}+\frac{x\ln\left(\frac{-b\,f^{x}+\sqrt{-ab}}{\sqrt{-ab}}\right)}{4\sqrt{-ab}\;a\ln(f)}-\frac{x\ln\left(\frac{b\,f^{x}+\sqrt{-ab}}{\sqrt{-ab}}\right)}{4\sqrt{-ab}\;a\ln(f)}+\frac{\mathrm{dilog}\left(\frac{-b\,f^{x}+\sqrt{-ab}}{\sqrt{-ab}}\right)}{4\sqrt{-ab}\;a\ln(f)^{2}}-\frac{\mathrm{dilog}\left(\frac{b\,f^{x}+\sqrt{-ab}}{\sqrt{-ab}}\right)}{4\sqrt{-ab}\;a\ln(f)^{2}}-\frac{\arctan\left(\frac{b\,f^{x}}{\sqrt{ab}}\right)}{2\sqrt{ab}\;a\ln(f)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^x*x/(b*f^(2*x)+a)^2,x)
```

```
[Out] 1/2/a/ln(f)*f^x*x/(a+b*(f^x)^2)+1/4/a/ln(f)*x/(-a*b)^(1/2)*ln((-b*f^x+(-a*b
)^(1/2))/(-a*b)^(1/2))-1/4/a/ln(f)*x/(-a*b)^(1/2)*ln((b*f^x+(-a*b)^(1/2))/(
-a*b)^(1/2))+1/4/a/ln(f)^2/(-a*b)^(1/2)*dilog((-b*f^x+(-a*b)^(1/2))/(-a*b)^
(1/2))-1/4/a/ln(f)^2/(-a*b)^(1/2)*dilog((b*f^x+(-a*b)^(1/2))/(-a*b)^(1/2))-
1/2/a/ln(f)^2/(a*b)^(1/2)*arctan(b*f^x/(a*b)^(1/2))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{f^{x}x}{2\left(abf^{2x}\log(f)+a^{2}\log(f)\right)}+\int\frac{\left(x\log(f)-1\right)f^{x}}{2\left(abf^{2x}\log(f)+a^{2}\log(f)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^x*x/(a+b*f^(2*x))^2,x, algorithm="maxima")
```

```
[Out] 1/2*f^x*x/(a*b*f^(2*x)*log(f) + a^2*log(f)) + integrate(1/2*(x*log(f) - 1)*
f^x/(a*b*f^(2*x)*log(f) + a^2*log(f)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{f^{x}\,x}{\left(a+b\,f^{2\,x}\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f^x*x)/(a + b*f^(2*x))^2,x)
```

```
[Out] int((f^x*x)/(a + b*f^(2*x))^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{f^{x}x}{2a^{2}\log(f)+2abf^{2x}\log(f)}+\frac{\int\left(-\frac{f^{x}}{a+bf^{2x}}\right)dx+\int\frac{f^{x}x\log(f)}{a+bf^{2x}}\,dx}{2a\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**x*x/(a+b*f**(2*x))**2,x)
```

```
[Out] f**x*x/(2*a**2*log(f) + 2*a*b*f**(2*x)*log(f)) + (Integral(-f**x/(a + b*f**
(2*x)), x) + Integral(f**x*x*log(f)/(a + b*f**(2*x)), x))/(2*a*log(f))
```

3.49 $\int \frac{f^x x^2}{\left(a+bf^{2x}\right)^2} \, dx$

Optimal. Leaf size=333

$$\frac{i\text{Li}_2\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log^3(f)}-\frac{i\text{Li}_2\left(\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log^3(f)}+\frac{i\text{Li}_3\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log^3(f)}-\frac{i\text{Li}_3\left(\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log^3(f)}-\frac{ix\text{Li}_2\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log^2(f)}+\frac{ix\text{Li}_2\left(\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log^2(f)}+\cdots$$

```
[Out] 1/2*f^x*x^2/a/(a+b*f^(2*x))/ln(f)-x*arctan(f^x*b^(1/2)/a^(1/2))/a^(3/2)/ln(
f)^2/b^(1/2)+1/2*x^2*arctan(f^x*b^(1/2)/a^(1/2))/a^(3/2)/ln(f)/b^(1/2)+1/2*
I*polylog(2,-I*f^x*b^(1/2)/a^(1/2))/a^(3/2)/ln(f)^3/b^(1/2)-1/2*I*x*polylog
(2,-I*f^x*b^(1/2)/a^(1/2))/a^(3/2)/ln(f)^2/b^(1/2)-1/2*I*polylog(2,I*f^x*b^
(1/2)/a^(1/2))/a^(3/2)/ln(f)^3/b^(1/2)+1/2*I*x*polylog(2,I*f^x*b^(1/2)/a^(1
/2))/a^(3/2)/ln(f)^2/b^(1/2)+1/2*I*polylog(3,-I*f^x*b^(1/2)/a^(1/2))/a^(3/2
)/ln(f)^3/b^(1/2)-1/2*I*polylog(3,I*f^x*b^(1/2)/a^(1/2))/a^(3/2)/ln(f)^3/b^
(1/2)
```

Rubi [A] time = 0.36, antiderivative size = 333, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 12, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.667, Rules used = {2249, 199, 205, 2245, 14, 12, 2282, 4848, 2391, 5143, 2531, 6589}

$$-\frac{ix\text{PolyLog}\left(2,-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log^2(f)}+\frac{i\text{PolyLog}\left(2,-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log^3(f)}+\frac{ix\text{PolyLog}\left(2,\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log^2(f)}-\frac{i\text{PolyLog}\left(2,\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log^3(f)}+\frac{i\text{PolyLog}\left(3,-\cdots\right)}{2a^{3/2}\sqrt{b}\log\cdots}$$

Antiderivative was successfully verified.

```
[In] Int[(f^x*x^2)/(a + b*f^(2*x))^2,x]
```

```
[Out] -((x*ArcTan[(Sqrt[b]*f^x)/Sqrt[a]])/(a^(3/2)*Sqrt[b]*Log[f]^2)) + (f^x*x^2)
/(2*a*(a + b*f^(2*x))*Log[f]) + (x^2*ArcTan[(Sqrt[b]*f^x)/Sqrt[a]])/(2*a^(3
/2)*Sqrt[b]*Log[f]) + ((I/2)*PolyLog[2, ((-I)*Sqrt[b]*f^x)/Sqrt[a]])/(a^(3/
2)*Sqrt[b]*Log[f]^3) - ((I/2)*x*PolyLog[2, ((-I)*Sqrt[b]*f^x)/Sqrt[a]])/(a^
(3/2)*Sqrt[b]*Log[f]^2) - ((I/2)*PolyLog[2, (I*Sqrt[b]*f^x)/Sqrt[a]])/(a^(3
/2)*Sqrt[b]*Log[f]^3) + ((I/2)*x*PolyLog[2, (I*Sqrt[b]*f^x)/Sqrt[a]])/(a^(3
/2)*Sqrt[b]*Log[f]^2) + ((I/2)*PolyLog[3, ((-I)*Sqrt[b]*f^x)/Sqrt[a]])/(a^(
3/2)*Sqrt[b]*Log[f]^3) - ((I/2)*PolyLog[3, (I*Sqrt[b]*f^x)/Sqrt[a]])/(a^(3/
2)*Sqrt[b]*Log[f]^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2245

```
Int[(F_)^((e_.)*((c_.) + (d_.)*(x_)))*((a_.) + (b_.)*(F_)^(v_))^(p_)*(x_)^(
m_.), x_Symbol] :> With[{u = IntHide[F^(e*(c + d*x))*(a + b*F^v)^p, x]}, Di
st[x^m, u, x] - Dist[m, Int[x^(m - 1)*u, x], x]] /; FreeQ[{F, a, b, c, d, e
}, x] && EqQ[v, 2*e*(c + d*x)] && GtQ[m, 0] && ILtQ[p, 0]
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 5143

```
Int[ArcTan[(a_.) + (b_.)*(f_)^((c_.) + (d_.)*(x_))]*(x_)^(m_.), x_Symbol] :
> Dist[I/2, Int[x^m*Log[1 - I*a - I*b*f^(c + d*x)], x], x] - Dist[I/2, Int[
x^m*Log[1 + I*a + I*b*f^(c + d*x)], x], x] /; FreeQ[{a, b, c, d, f}, x] &&
IntegerQ[m] && m > 0
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{f^x x^2}{\left(a+bf^{2x}\right)^2}\,dx = \frac{f^x x^2}{2a\left(a+bf^{2x}\right)\log(f)} + \frac{x^2\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log(f)} - 2\int x\left(\frac{f^x}{2a\left(a+bf^{2x}\right)\log(f)} + \frac{\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log(f)}\right) d$$

$$= \frac{f^x x^2}{2a\left(a+bf^{2x}\right)\log(f)} + \frac{x^2\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log(f)} - 2\int\left(\frac{f^x x}{2a\left(a+bf^{2x}\right)\log(f)} + \frac{x\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log(f)}\right) dx$$

$$= \frac{f^x x^2}{2a\left(a+bf^{2x}\right)\log(f)} + \frac{x^2\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log(f)} - \frac{\int \frac{f^x x}{a+bf^{2x}}\,dx}{a\log(f)} - \frac{\int x\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right) dx}{a^{3/2}\sqrt{b}\log(f)}$$

$$= -\frac{x\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{a^{3/2}\sqrt{b}\log^2(f)} + \frac{f^x x^2}{2a\left(a+bf^{2x}\right)\log(f)} + \frac{x^2\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log(f)} + \frac{\int \frac{\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log(f)}\,dx}{a\log(f)} - \frac{i\int x\log(}{2a^{3/2}}$$

$$= -\frac{x\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{a^{3/2}\sqrt{b}\log^2(f)} + \frac{f^x x^2}{2a\left(a+bf^{2x}\right)\log(f)} + \frac{x^2\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log(f)} - \frac{ix\text{Li}_2\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log^2(f)} + \frac{ix\text{Li}_2\left(\frac{i}{}\right.}{2a^{3/2}\sqrt{b}\,\text{l}}$$

$$= -\frac{x\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{a^{3/2}\sqrt{b}\log^2(f)} + \frac{f^x x^2}{2a\left(a+bf^{2x}\right)\log(f)} + \frac{x^2\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log(f)} - \frac{ix\text{Li}_2\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log^2(f)} + \frac{ix\text{Li}_2\left(\frac{i}{}\right.}{2a^{3/2}\sqrt{b}\,\text{l}}$$

$$= -\frac{x\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{a^{3/2}\sqrt{b}\log^2(f)} + \frac{f^x x^2}{2a\left(a+bf^{2x}\right)\log(f)} + \frac{x^2\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log(f)} - \frac{ix\text{Li}_2\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log^2(f)} + \frac{ix\text{Li}_2\left(\frac{i}{}\right.}{2a^{3/2}\sqrt{b}\,\text{l}}$$

$$= -\frac{x\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{a^{3/2}\sqrt{b}\log^2(f)} + \frac{f^x x^2}{2a\left(a+bf^{2x}\right)\log(f)} + \frac{x^2\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log(f)} + \frac{i\text{Li}_2\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log^3(f)} - \frac{ix\text{Li}_2\left(-\frac{i}{}\right.}{2a^{3/2}\sqrt{b}\,\text{l}}$$

Mathematica [A] time = 0.12, size = 477, normalized size = 1.43

$$-\frac{\frac{-\frac{i\text{Li}_2\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\log^2(f)} - \frac{ix\log\left(1+\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\log(f)} + \frac{ix^2}{2\sqrt{a}}}{2\sqrt{b}} + \frac{\frac{i\text{Li}_2\left(\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\log^2(f)} + \frac{ix\log\left(1-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\log(f)} - \frac{ix^2}{2\sqrt{a}}}{2\sqrt{b}}}{a\log(f)} + \frac{\frac{\frac{2i\text{Li}_3\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\log^3(f)} - \frac{2ix\text{Li}_2\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\log^2(f)} - \frac{ix^2\log\left(1+\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\log(f)} + \frac{ix^3}{3\sqrt{a}}}{2\sqrt{b}} + \frac{-\frac{2i\text{Li}}{\sqrt{}}}{}}{2a}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f^x*x^2)/(a + b*f^(2*x))^2,x]
```

```
[Out] (f^x*x^2)/(2*a*(a + b*f^(2*x))*Log[f]) - ((((I/2)*x^2)/Sqrt[a] - (I*x*Log[1
 + (I*Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Log[f]) - (I*PolyLog[2, ((-I)*Sqrt[b]
*f^x)/Sqrt[a]])/(Sqrt[a]*Log[f]^2))/(2*Sqrt[b]) + (((-1/2*I)*x^2)/Sqrt[a] +
 (I*x*Log[1 - (I*Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Log[f]) + (I*PolyLog[2, (I
*Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Log[f]^2))/(2*Sqrt[b]))/(a*Log[f]) + ((((I
/3)*x^3)/Sqrt[a] - (I*x^2*Log[1 + (I*Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Log[f]
) - ((2*I)*x*PolyLog[2, ((-I)*Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Log[f]^2) + (
(2*I)*PolyLog[3, ((-I)*Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Log[f]^3))/(2*Sqrt[b
]) + (((-1/3*I)*x^3)/Sqrt[a] + (I*x^2*Log[1 - (I*Sqrt[b]*f^x)/Sqrt[a]])/(Sq
rt[a]*Log[f]) + ((2*I)*x*PolyLog[2, (I*Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Log[
f]^2) - ((2*I)*PolyLog[3, (I*Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Log[f]^3))/(2*
Sqrt[b]))/(2*a)
```

fricas [C] time = 0.43, size = 388, normalized size = 1.17

$$\frac{2\,bf^{x}x^{2}\log(f)^{2}+2\left(\left(bx\log(f)-b\right)f^{2\,x}\sqrt{-\frac{b}{a}}+\left(ax\log(f)-a\right)\sqrt{-\frac{b}{a}}\right)\mathrm{Li}_2\left(f^{x}\sqrt{-\frac{b}{a}}\right)-2\left(\left(bx\log(f)-b\right)f^{2\,x}\sqrt{-\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^x*x^2/(a+b*f^(2*x))^2,x, algorithm="fricas")
```

```
[Out] 1/4*(2*b*f^x*x^2*log(f)^2 + 2*((b*x*log(f) - b)*f^(2*x)*sqrt(-b/a) + (a*x*l
og(f) - a)*sqrt(-b/a))*dilog(f^x*sqrt(-b/a)) - 2*((b*x*log(f) - b)*f^(2*x)*
sqrt(-b/a) + (a*x*log(f) - a)*sqrt(-b/a))*dilog(-f^x*sqrt(-b/a)) - ((b*x^2*
log(f)^2 - 2*b*x*log(f))*f^(2*x)*sqrt(-b/a) + (a*x^2*log(f)^2 - 2*a*x*log(f
))*sqrt(-b/a))*log(f^x*sqrt(-b/a) + 1) + ((b*x^2*log(f)^2 - 2*b*x*log(f))*f
^(2*x)*sqrt(-b/a) + (a*x^2*log(f)^2 - 2*a*x*log(f))*sqrt(-b/a))*log(-f^x*sq
rt(-b/a) + 1) - 2*(b*f^(2*x)*sqrt(-b/a) + a*sqrt(-b/a))*polylog(3, f^x*sqrt
(-b/a)) + 2*(b*f^(2*x)*sqrt(-b/a) + a*sqrt(-b/a))*polylog(3, -f^x*sqrt(-b/a
)))/(a*b^2*f^(2*x)*log(f)^3 + a^2*b*log(f)^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{x}x^{2}}{\left(bf^{2\,x}+a\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^x*x^2/(a+b*f^(2*x))^2,x, algorithm="giac")
```

```
[Out] integrate(f^x*x^2/(b*f^(2*x) + a)^2, x)
```

maple [F] time = 0.19, size = 0, normalized size = 0.00

$$\int \frac{x^{2} f^{x}}{\left(b\,f^{2x}+a\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^x*x^2/(b*f^(2*x)+a)^2,x)
```

```
[Out] int(f^x*x^2/(b*f^(2*x)+a)^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{f^{x}x^{2}}{2\left(abf^{2\,x}\log(f)+a^{2}\log(f)\right)}+\int \frac{\left(x^{2}\log(f)-2\,x\right)f^{x}}{2\left(abf^{2\,x}\log(f)+a^{2}\log(f)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^x*x^2/(a+b*f^(2*x))^2,x, algorithm="maxima")
```

```
[Out] 1/2*f^x*x^2/(a*b*f^(2*x)*log(f) + a^2*log(f)) + integrate(1/2*(x^2*log(f) -
 2*x)*f^x/(a*b*f^(2*x)*log(f) + a^2*log(f)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{f^{x}\,x^{2}}{\left(a+b\,f^{2\,x}\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f^x*x^2)/(a + b*f^(2*x))^2,x)
```

```
[Out] int((f^x*x^2)/(a + b*f^(2*x))^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{f^{x}x^{2}}{2a^{2}\log{(f)}+2abf^{2x}\log{(f)}}+\frac{\int\left(-\frac{2f^{x}x}{a+bf^{2x}}\right)dx+\int\frac{f^{x}x^{2}\log{(f)}}{a+bf^{2x}}\,dx}{2a\log{(f)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**x*x**2/(a+b*f**(2*x))**2,x)
```

```
[Out] f**x*x**2/(2*a**2*log(f) + 2*a*b*f**(2*x)*log(f)) + (Integral(-2*f**x*x/(a
+ b*f**(2*x)), x) + Integral(f**x*x**2*log(f)/(a + b*f**(2*x)), x))/(2*a*lo
g(f))
```

3.50 $\int \frac{f^x x^3}{\left(a+bf^{2x}\right)^2}\,dx$

Optimal. Leaf size=501

$$-\frac{3ix^2\text{Li}_2\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{4a^{3/2}\sqrt{b}\log^2(f)}+\frac{3ix^2\text{Li}_2\left(\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{4a^{3/2}\sqrt{b}\log^2(f)}-\frac{3i\text{Li}_3\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log^4(f)}+\frac{3i\text{Li}_3\left(\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log^4(f)}-\frac{3i\text{Li}_4\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log^4(f)}+\frac{3i\text{Li}_4\left(\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log^4(f)}$$

```
[Out] 1/2*f^x*x^3/a/(a+b*f^(2*x))/ln(f)-3/2*x^2*arctan(f^x*b^(1/2)/a^(1/2))/a^(3/
2)/ln(f)^2/b^(1/2)+1/2*x^3*arctan(f^x*b^(1/2)/a^(1/2))/a^(3/2)/ln(f)/b^(1/2
)+3/2*I*x*polylog(2,-I*f^x*b^(1/2)/a^(1/2))/a^(3/2)/ln(f)^3/b^(1/2)-3/4*I*x
^2*polylog(2,-I*f^x*b^(1/2)/a^(1/2))/a^(3/2)/ln(f)^2/b^(1/2)-3/2*I*x*polylo
g(2,I*f^x*b^(1/2)/a^(1/2))/a^(3/2)/ln(f)^3/b^(1/2)+3/4*I*x^2*polylog(2,I*f^
x*b^(1/2)/a^(1/2))/a^(3/2)/ln(f)^2/b^(1/2)-3/2*I*polylog(3,-I*f^x*b^(1/2)/a
^(1/2))/a^(3/2)/ln(f)^4/b^(1/2)+3/2*I*x*polylog(3,-I*f^x*b^(1/2)/a^(1/2))/a
^(3/2)/ln(f)^3/b^(1/2)+3/2*I*polylog(3,I*f^x*b^(1/2)/a^(1/2))/a^(3/2)/ln(f)
^4/b^(1/2)-3/2*I*x*polylog(3,I*f^x*b^(1/2)/a^(1/2))/a^(3/2)/ln(f)^3/b^(1/2)
-3/2*I*polylog(4,-I*f^x*b^(1/2)/a^(1/2))/a^(3/2)/ln(f)^4/b^(1/2)+3/2*I*poly
log(4,I*f^x*b^(1/2)/a^(1/2))/a^(3/2)/ln(f)^4/b^(1/2)
```

Rubi [A] time = 0.51, antiderivative size = 501, normalized size of antiderivative = 1.00, number of steps used = 21, number of rules used = 11, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.611, Rules used = {2249, 199, 205, 2245, 14, 12, 5143, 2531, 2282, 6589, 6609}

$$-\frac{3ix^2\text{PolyLog}\left(2,-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{4a^{3/2}\sqrt{b}\log^2(f)}+\frac{3ix^2\text{PolyLog}\left(2,\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{4a^{3/2}\sqrt{b}\log^2(f)}+\frac{3ix\text{PolyLog}\left(2,-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log^3(f)}-\frac{3ix\text{PolyLog}\left(2,\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log^3(f)}+\frac{3ix\text{Po}}{2a}$$

Antiderivative was successfully verified.

```
[In] Int[(f^x*x^3)/(a + b*f^(2*x))^2,x]
```

```
[Out] (-3*x^2*ArcTan[(Sqrt[b]*f^x)/Sqrt[a]])/(2*a^(3/2)*Sqrt[b]*Log[f]^2) + (f^x*
x^3)/(2*a*(a + b*f^(2*x))*Log[f]) + (x^3*ArcTan[(Sqrt[b]*f^x)/Sqrt[a]])/(2*
a^(3/2)*Sqrt[b]*Log[f]) + (((3*I)/2)*x*PolyLog[2, ((-I)*Sqrt[b]*f^x)/Sqrt[a
]])/(a^(3/2)*Sqrt[b]*Log[f]^3) - (((3*I)/4)*x^2*PolyLog[2, ((-I)*Sqrt[b]*f^
x)/Sqrt[a]])/(a^(3/2)*Sqrt[b]*Log[f]^2) - (((3*I)/2)*x*PolyLog[2, (I*Sqrt[b
]*f^x)/Sqrt[a]])/(a^(3/2)*Sqrt[b]*Log[f]^3) + (((3*I)/4)*x^2*PolyLog[2, (I*
Sqrt[b]*f^x)/Sqrt[a]])/(a^(3/2)*Sqrt[b]*Log[f]^2) - (((3*I)/2)*PolyLog[3, (
(-I)*Sqrt[b]*f^x)/Sqrt[a]])/(a^(3/2)*Sqrt[b]*Log[f]^4) + (((3*I)/2)*x*PolyL
og[3, ((-I)*Sqrt[b]*f^x)/Sqrt[a]])/(a^(3/2)*Sqrt[b]*Log[f]^3) + (((3*I)/2)*
PolyLog[3, (I*Sqrt[b]*f^x)/Sqrt[a]])/(a^(3/2)*Sqrt[b]*Log[f]^4) - (((3*I)/2
```

```
)*x*PolyLog[3, (I*Sqrt[b]*f^x)/Sqrt[a]])/(a^(3/2)*Sqrt[b]*Log[f]^3) - (((3*
I)/2)*PolyLog[4, ((-I)*Sqrt[b]*f^x)/Sqrt[a]])/(a^(3/2)*Sqrt[b]*Log[f]^4) +
(((3*I)/2)*PolyLog[4, (I*Sqrt[b]*f^x)/Sqrt[a]])/(a^(3/2)*Sqrt[b]*Log[f]^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2245

```
Int[(F_)^((e_.)*((c_.) + (d_.)*(x_)))*((a_.) + (b_.)*(F_)^(v_))^(p_)*(x_)^(
m_.), x_Symbol] :> With[{u = IntHide[F^(e*(c + d*x))*(a + b*F^v)^p, x]}, Di
st[x^m, u, x] - Dist[m, Int[x^(m - 1)*u, x], x]] /; FreeQ[{F, a, b, c, d, e
}, x] && EqQ[v, 2*e*(c + d*x)] && GtQ[m, 0] && ILtQ[p, 0]
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 5143

```
Int[ArcTan[(a_.) + (b_.)*(f_)^((c_.) + (d_.)*(x_))]*(x_)^(m_.), x_Symbol] :
> Dist[I/2, Int[x^m*Log[1 - I*a - I*b*f^(c + d*x)], x], x] - Dist[I/2, Int[
x^m*Log[1 + I*a + I*b*f^(c + d*x)], x], x] /; FreeQ[{a, b, c, d, f}, x] &&
IntegerQ[m] && m > 0
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\int \frac{f^x x^3}{\left(a+bf^{2x}\right)^2}\,dx = \frac{f^x x^3}{2a\left(a+bf^{2x}\right)\log(f)} + \frac{x^3\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log(f)} - 3\int x^2\left(\frac{f^x}{2a\left(a+bf^{2x}\right)\log(f)} + \frac{\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log(f)}\right)$$

$$= \frac{f^x x^3}{2a\left(a+bf^{2x}\right)\log(f)} + \frac{x^3\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log(f)} - 3\int\left(\frac{f^x x^2}{2a\left(a+bf^{2x}\right)\log(f)} + \frac{x^2\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log(f)}\right)dx$$

$$= \frac{f^x x^3}{2a\left(a+bf^{2x}\right)\log(f)} + \frac{x^3\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log(f)} - \frac{3\int\frac{f^x x^2}{a+bf^{2x}}\,dx}{2a\log(f)} - \frac{3\int x^2\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)dx}{2a^{3/2}\sqrt{b}\log(f)}$$

$$= -\frac{3x^2\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log^2(f)} + \frac{f^x x^3}{2a\left(a+bf^{2x}\right)\log(f)} + \frac{x^3\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log(f)} + \frac{3\int\frac{x\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log(f)}\,dx}{a\log(f)} - \frac{(3i)\int}{}$$

$$= -\frac{3x^2\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log^2(f)} + \frac{f^x x^3}{2a\left(a+bf^{2x}\right)\log(f)} + \frac{x^3\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log(f)} - \frac{3ix^2\mathrm{Li}_2\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{4a^{3/2}\sqrt{b}\log^2(f)} + \frac{3ix^2\mathrm{Li}}{4a^{3/2}\sqrt{}}$$

$$= -\frac{3x^2\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log^2(f)} + \frac{f^x x^3}{2a\left(a+bf^{2x}\right)\log(f)} + \frac{x^3\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log(f)} - \frac{3ix^2\mathrm{Li}_2\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{4a^{3/2}\sqrt{b}\log^2(f)} + \frac{3ix^2\mathrm{Li}}{4a^{3/2}\sqrt{}}$$

$$= -\frac{3x^2\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log^2(f)} + \frac{f^x x^3}{2a\left(a+bf^{2x}\right)\log(f)} + \frac{x^3\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log(f)} + \frac{3ix\mathrm{Li}_2\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log^3(f)} - \frac{3ix^2\mathrm{Li}_2}{4a^{3/2}\sqrt{b}}$$

$$= -\frac{3x^2\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log^2(f)} + \frac{f^x x^3}{2a\left(a+bf^{2x}\right)\log(f)} + \frac{x^3\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log(f)} + \frac{3ix\mathrm{Li}_2\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log^3(f)} - \frac{3ix^2\mathrm{Li}_2}{4a^{3/2}\sqrt{b}}$$

$$= -\frac{3x^2\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log^2(f)} + \frac{f^x x^3}{2a\left(a+bf^{2x}\right)\log(f)} + \frac{x^3\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log(f)} + \frac{3ix\mathrm{Li}_2\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}\log^3(f)} - \frac{3ix^2\mathrm{Li}_2}{4a^{3/2}\sqrt{b}}$$

Mathematica [A] time = 0.27, size = 434, normalized size = 0.87

$$\frac{-\frac{6i\mathrm{Li}_3\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{b}} + \frac{6i\mathrm{Li}_3\left(\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{b}} - \frac{6i\mathrm{Li}_4\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{b}} + \frac{6i\mathrm{Li}_4\left(\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{b}} - \frac{3ix\log(f)(x\log(f)-2)\mathrm{Li}_2\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{b}} + \frac{3ix\log(f)(x\log(f)-2)\mathrm{Li}_2\left(\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{b}}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f^x*x^3)/(a + b*f^(2*x))^2,x]
```

```
[Out] ((2*Sqrt[a]*f^x*x^3*Log[f]^3)/(a + b*f^(2*x)) - ((3*I)*x^2*Log[f]^2*Log[1 -
 (I*Sqrt[b]*f^x)/Sqrt[a]])/Sqrt[b] + (I*x^3*Log[f]^3*Log[1 - (I*Sqrt[b]*f^x
)/Sqrt[a]])/Sqrt[b] + ((3*I)*x^2*Log[f]^2*Log[1 + (I*Sqrt[b]*f^x)/Sqrt[a]])
/Sqrt[b] - (I*x^3*Log[f]^3*Log[1 + (I*Sqrt[b]*f^x)/Sqrt[a]])/Sqrt[b] - ((3*
I)*x*Log[f]*(-2 + x*Log[f])*PolyLog[2, ((-I)*Sqrt[b]*f^x)/Sqrt[a]])/Sqrt[b]
 + ((3*I)*x*Log[f]*(-2 + x*Log[f])*PolyLog[2, (I*Sqrt[b]*f^x)/Sqrt[a]])/Sqr
t[b] - ((6*I)*PolyLog[3, ((-I)*Sqrt[b]*f^x)/Sqrt[a]])/Sqrt[b] + ((6*I)*x*Lo
g[f]*PolyLog[3, ((-I)*Sqrt[b]*f^x)/Sqrt[a]])/Sqrt[b] + ((6*I)*PolyLog[3, (I
*Sqrt[b]*f^x)/Sqrt[a]])/Sqrt[b] - ((6*I)*x*Log[f]*PolyLog[3, (I*Sqrt[b]*f^x
)/Sqrt[a]])/Sqrt[b] - ((6*I)*PolyLog[4, ((-I)*Sqrt[b]*f^x)/Sqrt[a]])/Sqrt[b
] + ((6*I)*PolyLog[4, (I*Sqrt[b]*f^x)/Sqrt[a]])/Sqrt[b])/(4*a^(3/2)*Log[f]^
4)
```

fricas [C] time = 0.44, size = 549, normalized size = 1.10

$$\frac{2\,bf^{x}x^{3}\log(f)^{3}+3\left(\left(bx^{2}\log(f)^{2}-2\,bx\log(f)\right)f^{2\,x}\sqrt{-\frac{b}{a}}+\left(ax^{2}\log(f)^{2}-2\,ax\log(f)\right)\sqrt{-\frac{b}{a}}\right)\mathrm{Li}_2\left(f^{x}\sqrt{-\frac{b}{a}}\right)-3}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^x*x^3/(a+b*f^(2*x))^2,x, algorithm="fricas")
```

```
[Out] 1/4*(2*b*f^x*x^3*log(f)^3 + 3*((b*x^2*log(f)^2 - 2*b*x*log(f))*f^(2*x)*sqrt
(-b/a) + (a*x^2*log(f)^2 - 2*a*x*log(f))*sqrt(-b/a))*dilog(f^x*sqrt(-b/a))
- 3*((b*x^2*log(f)^2 - 2*b*x*log(f))*f^(2*x)*sqrt(-b/a) + (a*x^2*log(f)^2 -
 2*a*x*log(f))*sqrt(-b/a))*dilog(-f^x*sqrt(-b/a)) - ((b*x^3*log(f)^3 - 3*b*
x^2*log(f)^2)*f^(2*x)*sqrt(-b/a) + (a*x^3*log(f)^3 - 3*a*x^2*log(f)^2)*sqrt
(-b/a))*log(f^x*sqrt(-b/a) + 1) + ((b*x^3*log(f)^3 - 3*b*x^2*log(f)^2)*f^(2
*x)*sqrt(-b/a) + (a*x^3*log(f)^3 - 3*a*x^2*log(f)^2)*sqrt(-b/a))*log(-f^x*s
qrt(-b/a) + 1) + 6*(b*f^(2*x)*sqrt(-b/a) + a*sqrt(-b/a))*polylog(4, f^x*sqr
t(-b/a)) - 6*(b*f^(2*x)*sqrt(-b/a) + a*sqrt(-b/a))*polylog(4, -f^x*sqrt(-b/
a)) - 6*((b*x*log(f) - b)*f^(2*x)*sqrt(-b/a) + (a*x*log(f) - a)*sqrt(-b/a))
*polylog(3, f^x*sqrt(-b/a)) + 6*((b*x*log(f) - b)*f^(2*x)*sqrt(-b/a) + (a*x
*log(f) - a)*sqrt(-b/a))*polylog(3, -f^x*sqrt(-b/a)))/(a*b^2*f^(2*x)*log(f)
^4 + a^2*b*log(f)^4)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{x}x^{3}}{\left(bf^{2\,x}+a\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^x*x^3/(a+b*f^(2*x))^2,x, algorithm="giac")
```

```
[Out] integrate(f^x*x^3/(b*f^(2*x) + a)^2, x)
```

maple [F] time = 0.18, size = 0, normalized size = 0.00

$$\int \frac{x^{3} f^{x}}{\left(b\, f^{2 x}+a\right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^x*x^3/(b*f^(2*x)+a)^2,x)
```

```
[Out] int(f^x*x^3/(b*f^(2*x)+a)^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{f^{x} x^{3}}{2 \left(a b f^{2 x} \log(f) + a^{2} \log(f)\right)} + \int \frac{\left(x^{3} \log(f) - 3 x^{2}\right) f^{x}}{2 \left(a b f^{2 x} \log(f) + a^{2} \log(f)\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^x*x^3/(a+b*f^(2*x))^2,x, algorithm="maxima")
```

```
[Out] 1/2*f^x*x^3/(a*b*f^(2*x)*log(f) + a^2*log(f)) + integrate(1/2*(x^3*log(f) -
 3*x^2)*f^x/(a*b*f^(2*x)*log(f) + a^2*log(f)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{f^{x}\, x^{3}}{\left(a+b\, f^{2\, x}\right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f^x*x^3)/(a + b*f^(2*x))^2,x)
```

```
[Out] int((f^x*x^3)/(a + b*f^(2*x))^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{f^{x} x^{3}}{2 a^{2} \log{\left(f \right)} + 2 a b f^{2 x} \log{\left(f \right)}} + \frac{\int \left(- \frac{3 f^{x} x^{2}}{a + b f^{2 x}}\right)\, dx + \int \frac{f^{x} x^{3} \log{\left(f \right)}}{a + b f^{2 x}}\, dx}{2 a \log{\left(f \right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**x*x**3/(a+b*f**(2*x))**2,x)
```

```
[Out] f**x*x**3/(2*a**2*log(f) + 2*a*b*f**(2*x)*log(f)) + (Integral(-3*f**x*x**2/
(a + b*f**(2*x)), x) + Integral(f**x*x**3*log(f)/(a + b*f**(2*x)), x))/(2*a
*log(f))
```

3.51 $\int \frac{f^x}{\left(a+bf^{2x}\right)^3}\,dx$

Optimal. Leaf size=84

$$\frac{3\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{8a^{5/2}\sqrt{b}\,\log(f)}+\frac{3f^x}{8a^2\log(f)\left(a+bf^{2x}\right)}+\frac{f^x}{4a\log(f)\left(a+bf^{2x}\right)^2}$$

```
[Out] 1/4*f^x/a/(a+b*f^(2*x))^2/ln(f)+3/8*f^x/a^2/(a+b*f^(2*x))/ln(f)+3/8*arctan(
f^x*b^(1/2)/a^(1/2))/a^(5/2)/ln(f)/b^(1/2)
```

Rubi [A] time = 0.05, antiderivative size = 84, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2249, 199, 205}

$$\frac{3f^x}{8a^2\log(f)\left(a+bf^{2x}\right)}+\frac{3\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{8a^{5/2}\sqrt{b}\,\log(f)}+\frac{f^x}{4a\log(f)\left(a+bf^{2x}\right)^2}$$

Antiderivative was successfully verified.

```
[In] Int[f^x/(a + b*f^(2*x))^3,x]
```

```
[Out] f^x/(4*a*(a + b*f^(2*x))^2*Log[f]) + (3*f^x)/(8*a^2*(a + b*f^(2*x))*Log[f])
 + (3*ArcTan[(Sqrt[b]*f^x)/Sqrt[a]])/(8*a^(5/2)*Sqrt[b]*Log[f])
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
```

```
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\int \frac{f^x}{\left(a+bf^{2x}\right)^3}\,dx = \frac{\text{Subst}\left(\int \frac{1}{\left(a+bx^2\right)^3}\,dx,x,f^x\right)}{\log(f)}$$

$$= \frac{f^x}{4a\left(a+bf^{2x}\right)^2\log(f)} + \frac{3\,\text{Subst}\left(\int \frac{1}{\left(a+bx^2\right)^2}\,dx,x,f^x\right)}{4a\log(f)}$$

$$= \frac{f^x}{4a\left(a+bf^{2x}\right)^2\log(f)} + \frac{3f^x}{8a^2\left(a+bf^{2x}\right)\log(f)} + \frac{3\,\text{Subst}\left(\int \frac{1}{a+bx^2}\,dx,x,f^x\right)}{8a^2\log(f)}$$

$$= \frac{f^x}{4a\left(a+bf^{2x}\right)^2\log(f)} + \frac{3f^x}{8a^2\left(a+bf^{2x}\right)\log(f)} + \frac{3\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{8a^{5/2}\sqrt{b}\,\log(f)}$$

Mathematica [A] time = 0.05, size = 68, normalized size = 0.81

$$\frac{\frac{3\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{\sqrt{b}} + \frac{\sqrt{a}\,f^x\left(5a+3bf^{2x}\right)}{\left(a+bf^{2x}\right)^2}}{8a^{5/2}\log(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^x/(a + b*f^(2*x))^3,x]
```

```
[Out] ((Sqrt[a]*f^x*(5*a + 3*b*f^(2*x)))/(a + b*f^(2*x))^2 + (3*ArcTan[(Sqrt[b]*f
^x)/Sqrt[a]])/Sqrt[b])/(8*a^(5/2)*Log[f])
```

fricas [A] time = 0.43, size = 258, normalized size = 3.07

$$\left[\frac{6\,ab^2f^{3\,x}+10\,a^2bf^x-3\left(\sqrt{-ab}\,b^2f^{4\,x}+2\,\sqrt{-ab}\,abf^{2\,x}+\sqrt{-ab}\,a^2\right)\log\left(\frac{bf^{2\,x}-2\,\sqrt{-ab}\,f^x-a}{bf^{2\,x}+a}\right)}{16\left(a^3b^3f^{4\,x}\log(f)+2\,a^4b^2f^{2\,x}\log(f)+a^5b\log(f)\right)}, \frac{3\,ab^2f^{3\,x}+5\,a^2bf^x-}{8\left(a^3b^3f^4\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^x/(a+b*f^(2*x))^3,x, algorithm="fricas")
```

```
[Out] [1/16*(6*a*b^2*f^(3*x) + 10*a^2*b*f^x - 3*(sqrt(-a*b)*b^2*f^(4*x) + 2*sqrt(
-a*b)*a*b*f^(2*x) + sqrt(-a*b)*a^2)*log((b*f^(2*x) - 2*sqrt(-a*b)*f^x - a)/
(b*f^(2*x) + a)))/(a^3*b^3*f^(4*x)*log(f) + 2*a^4*b^2*f^(2*x)*log(f) + a^5*
b*log(f)), 1/8*(3*a*b^2*f^(3*x) + 5*a^2*b*f^x - 3*(sqrt(a*b)*b^2*f^(4*x) +
2*sqrt(a*b)*a*b*f^(2*x) + sqrt(a*b)*a^2)*arctan(sqrt(a*b)/(b*f^x)))/(a^3*b^
3*f^(4*x)*log(f) + 2*a^4*b^2*f^(2*x)*log(f) + a^5*b*log(f))]
```

giac [A] time = 0.40, size = 61, normalized size = 0.73

$$\frac{3 \arctan\left(\frac{bf^x}{\sqrt{ab}}\right)}{8\sqrt{ab}\,a^2\log(f)} + \frac{3\,bf^{3x} + 5\,af^x}{8\left(bf^{2x} + a\right)^2 a^2\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^x/(a+b*f^(2*x))^3,x, algorithm="giac")
```

```
[Out] 3/8*arctan(b*f^x/sqrt(a*b))/(sqrt(a*b)*a^2*log(f)) + 1/8*(3*b*f^(3*x) + 5*a
*f^x)/((b*f^(2*x) + a)^2*a^2*log(f))
```

maple [A] time = 0.06, size = 94, normalized size = 1.12

$$\frac{\left(3b\,f^{2x}+5a\right)f^x}{8\left(b\,f^{2x}+a\right)^2 a^2\ln(f)} - \frac{3\ln\left(-\frac{a}{\sqrt{-ab}}+f^x\right)}{16\sqrt{-ab}\;a^2\ln(f)} + \frac{3\ln\left(\frac{a}{\sqrt{-ab}}+f^x\right)}{16\sqrt{-ab}\;a^2\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^x/(b*f^(2*x)+a)^3,x)
```

```
[Out] 1/8*f^x*(3*b*(f^x)^2+5*a)/ln(f)/a^2/(a+b*(f^x)^2)^2-3/16/(-a*b)^(1/2)/a^2/l
n(f)*ln(-1/(-a*b)^(1/2)*a+f^x)+3/16/(-a*b)^(1/2)/a^2/ln(f)*ln(1/(-a*b)^(1/2
)*a+f^x)
```

maxima [A] time = 0.98, size = 76, normalized size = 0.90

$$\frac{3\,bf^{3x} + 5\,af^x}{8\left(a^2b^2f^{4x} + 2\,a^3bf^{2x} + a^4\right)\log(f)} + \frac{3 \arctan\left(\frac{bf^x}{\sqrt{ab}}\right)}{8\sqrt{ab}\,a^2\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^x/(a+b*f^(2*x))^3,x, algorithm="maxima")
```

```
[Out] 1/8*(3*b*f^(3*x) + 5*a*f^x)/((a^2*b^2*f^(4*x) + 2*a^3*b*f^(2*x) + a^4)*log(
f)) + 3/8*arctan(b*f^x/sqrt(a*b))/(sqrt(a*b)*a^2*log(f))
```

mupad [B] time = 3.57, size = 79, normalized size = 0.94

$$\frac{\frac{5\,f^x}{8\,a\,\ln(f)}+\frac{3\,b\,f^{3\,x}}{8\,a^2\,\ln(f)}}{b^2\,f^{4\,x}+a^2+2\,a\,b\,f^{2\,x}}+\frac{3\,\mathrm{atan}\left(\frac{b\,f^x}{\sqrt{a\,b}}\right)}{8\,a^2\,\ln(f)\,\sqrt{a\,b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^x/(a + b*f^(2*x))^3,x)
```

```
[Out] ((5*f^x)/(8*a*log(f)) + (3*b*f^(3*x))/(8*a^2*log(f)))/(b^2*f^(4*x) + a^2 +
2*a*b*f^(2*x)) + (3*atan((b*f^x)/(a*b)^(1/2)))/(8*a^2*log(f)*(a*b)^(1/2))
```

sympy [A] time = 0.35, size = 85, normalized size = 1.01

$$\frac{5af^x+3bf^{3x}}{8a^4\log(f)+16a^3bf^{2x}\log(f)+8a^2b^2f^{4x}\log(f)}+\frac{\operatorname{RootSum}\left(256z^2a^5b+9,\left(i\mapsto i\log\left(\frac{16ia^3}{3}+f^x\right)\right)\right)}{\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**x/(a+b*f**(2*x))**3,x)
```

```
[Out] (5*a*f**x + 3*b*f**(3*x))/(8*a**4*log(f) + 16*a**3*b*f**(2*x)*log(f) + 8*a*
*2*b**2*f**(4*x)*log(f)) + RootSum(256*_z**2*a**5*b + 9, Lambda(_i, _i*log(
16*_i*a**3/3 + f**x)))/log(f)
```

3.52 $\int \frac{f^x x}{\left(a+bf^{2x}\right)^3}\,dx$

Optimal. Leaf size=223

$$-\frac{3i\text{Li}_2\left(-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{16a^{5/2}\sqrt{b}\,\log^2(f)}+\frac{3i\text{Li}_2\left(\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{16a^{5/2}\sqrt{b}\,\log^2(f)}-\frac{\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{5/2}\sqrt{b}\,\log^2(f)}+\frac{3x\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{8a^{5/2}\sqrt{b}\,\log(f)}-\frac{f^x}{8a^2\log^2(f)\left(a+bf^{2x}\right)}+\frac{3x}{8a^2\log(f)}$$

```
[Out] -1/8*f^x/a^2/(a+b*f^(2*x))/ln(f)^2+1/4*f^x*x/a/(a+b*f^(2*x))^2/ln(f)+3/8*f^
x*x/a^2/(a+b*f^(2*x))/ln(f)-1/2*arctan(f^x*b^(1/2)/a^(1/2))/a^(5/2)/ln(f)^2
/b^(1/2)+3/8*x*arctan(f^x*b^(1/2)/a^(1/2))/a^(5/2)/ln(f)/b^(1/2)-3/16*I*pol
ylog(2,-I*f^x*b^(1/2)/a^(1/2))/a^(5/2)/ln(f)^2/b^(1/2)+3/16*I*polylog(2,I*f
^x*b^(1/2)/a^(1/2))/a^(5/2)/ln(f)^2/b^(1/2)
```

Rubi [A] time = 0.22, antiderivative size = 223, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 7, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.438, Rules used = {2249, 199, 205, 2245, 2282, 4848, 2391}

$$-\frac{3i\text{PolyLog}\left(2,-\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{16a^{5/2}\sqrt{b}\,\log^2(f)}+\frac{3i\text{PolyLog}\left(2,\frac{i\sqrt{b}\,f^x}{\sqrt{a}}\right)}{16a^{5/2}\sqrt{b}\,\log^2(f)}-\frac{f^x}{8a^2\log^2(f)\left(a+bf^{2x}\right)}+\frac{3xf^x}{8a^2\log(f)\left(a+bf^{2x}\right)}-\frac{\tan^{-1}\left(\frac{\sqrt{b}\,f^x}{\sqrt{a}}\right)}{2a^{5/2}\sqrt{b}\,\log^2(f)}$$

Antiderivative was successfully verified.

```
[In] Int[(f^x*x)/(a + b*f^(2*x))^3,x]
```

```
[Out] -f^x/(8*a^2*(a + b*f^(2*x))*Log[f]^2) - ArcTan[(Sqrt[b]*f^x)/Sqrt[a]]/(2*a^
(5/2)*Sqrt[b]*Log[f]^2) + (f^x*x)/(4*a*(a + b*f^(2*x))^2*Log[f]) + (3*f^x*x
)/(8*a^2*(a + b*f^(2*x))*Log[f]) + (3*x*ArcTan[(Sqrt[b]*f^x)/Sqrt[a]])/(8*a
^(5/2)*Sqrt[b]*Log[f]) - (((3*I)/16)*PolyLog[2, ((-I)*Sqrt[b]*f^x)/Sqrt[a]]
)/(a^(5/2)*Sqrt[b]*Log[f]^2) + (((3*I)/16)*PolyLog[2, (I*Sqrt[b]*f^x)/Sqrt[
a]])/(a^(5/2)*Sqrt[b]*Log[f]^2)
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2245

```
Int[(F_)^((e_.)*((c_.) + (d_.)*(x_)))*((a_.) + (b_.)*(F_)^(v_))^(p_)*(x_)^(
m_.), x_Symbol] :> With[{u = IntHide[F^(e*(c + d*x))*(a + b*F^v)^p, x]}, Di
st[x^m, u, x] - Dist[m, Int[x^(m - 1)*u, x], x]] /; FreeQ[{F, a, b, c, d, e
}, x] && EqQ[v, 2*e*(c + d*x)] && GtQ[m, 0] && ILtQ[p, 0]
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rubi steps

$$\int \frac{f^x x}{\left(a+bf^{2x}\right)^3}\,dx = \frac{f^x x}{4a\left(a+bf^{2x}\right)^2\log(f)} + \frac{3f^x x}{8a^2\left(a+bf^{2x}\right)\log(f)} + \frac{3x\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{8a^{5/2}\sqrt{b}\log(f)} - \int \left(\frac{f^x}{4a\left(a+bf^{2x}\right)^2\log(\right.$$

$$= \frac{f^x x}{4a\left(a+bf^{2x}\right)^2\log(f)} + \frac{3f^x x}{8a^2\left(a+bf^{2x}\right)\log(f)} + \frac{3x\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{8a^{5/2}\sqrt{b}\log(f)} - \frac{3\int \frac{f^x}{a+bf^{2x}}\,dx}{8a^2\log(f)} - \frac{\int \frac{f^x}{(a+bf^{2}}}{4a\log}$$

$$= \frac{f^x x}{4a\left(a+bf^{2x}\right)^2\log(f)} + \frac{3f^x x}{8a^2\left(a+bf^{2x}\right)\log(f)} + \frac{3x\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{8a^{5/2}\sqrt{b}\log(f)} - \frac{3\,\text{Subst}\left(\int \frac{1}{a+bx^2}\,dx, x, \right.}{8a^2\log^2(f)}$$

$$= -\frac{f^x}{8a^2\left(a+bf^{2x}\right)\log^2(f)} - \frac{3\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{8a^{5/2}\sqrt{b}\log^2(f)} + \frac{f^x x}{4a\left(a+bf^{2x}\right)^2\log(f)} + \frac{3f^x x}{8a^2\left(a+bf^{2x}\right)\log(f}$$

$$= -\frac{f^x}{8a^2\left(a+bf^{2x}\right)\log^2(f)} - \frac{\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{5/2}\sqrt{b}\log^2(f)} + \frac{f^x x}{4a\left(a+bf^{2x}\right)^2\log(f)} + \frac{3f^x x}{8a^2\left(a+bf^{2x}\right)\log(f}$$

Mathematica [A] time = 0.31, size = 184, normalized size = 0.83

$$\frac{\frac{6i\left(-\text{Li}_2\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)+\text{Li}_2\left(\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)+x\log(f)\left(\log\left(1-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)-\log\left(1+\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)\right)\right)}{\sqrt{a}\sqrt{b}} - \frac{16\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}} + \frac{8axf^x\log(f)}{\left(a+bf^{2x}\right)^2} + \frac{4f^x(3x\log(f)-1)}{a+bf^{2x}}}{32a^2\log^2(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f^x*x)/(a + b*f^(2*x))^3,x]
```

```
[Out] ((-16*ArcTan[(Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Sqrt[b]) + (8*a*f^x*x*Log[f])
/(a + b*f^(2*x))^2 + (4*f^x*(-1 + 3*x*Log[f]))/(a + b*f^(2*x)) + ((6*I)*(x*
Log[f]*(Log[1 - (I*Sqrt[b]*f^x)/Sqrt[a]] - Log[1 + (I*Sqrt[b]*f^x)/Sqrt[a]]
) - PolyLog[2, ((-I)*Sqrt[b]*f^x)/Sqrt[a]] + PolyLog[2, (I*Sqrt[b]*f^x)/Sqr
t[a]]))/(Sqrt[a]*Sqrt[b]))/(32*a^2*Log[f]^2)
```

fricas [B] time = 0.43, size = 494, normalized size = 2.22

$$2\left(3b^2x\log(f)-b^2\right)f^{3x} + 2\left(5abx\log(f)-ab\right)f^x + 3\left(b^2f^{4x}\sqrt{-\frac{b}{a}} + 2abf^{2x}\sqrt{-\frac{b}{a}} + a^2\sqrt{-\frac{b}{a}}\right)\text{Li}_2\left(f^x\sqrt{-\frac{b}{a}}\right) - 3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^x*x/(a+b*f^(2*x))^3,x, algorithm="fricas")
```

```
[Out] 1/16*(2*(3*b^2*x*log(f) - b^2)*f^(3*x) + 2*(5*a*b*x*log(f) - a*b)*f^x + 3*(
b^2*f^(4*x)*sqrt(-b/a) + 2*a*b*f^(2*x)*sqrt(-b/a) + a^2*sqrt(-b/a))*dilog(f
^x*sqrt(-b/a)) - 3*(b^2*f^(4*x)*sqrt(-b/a) + 2*a*b*f^(2*x)*sqrt(-b/a) + a^2
*sqrt(-b/a))*dilog(-f^x*sqrt(-b/a)) - 4*(b^2*f^(4*x)*sqrt(-b/a) + 2*a*b*f^(
2*x)*sqrt(-b/a) + a^2*sqrt(-b/a))*log(2*b*f^x + 2*a*sqrt(-b/a)) + 4*(b^2*f^
(4*x)*sqrt(-b/a) + 2*a*b*f^(2*x)*sqrt(-b/a) + a^2*sqrt(-b/a))*log(2*b*f^x -
 2*a*sqrt(-b/a)) - 3*(b^2*f^(4*x)*x*sqrt(-b/a)*log(f) + 2*a*b*f^(2*x)*x*sqr
t(-b/a)*log(f) + a^2*x*sqrt(-b/a)*log(f))*log(f^x*sqrt(-b/a) + 1) + 3*(b^2*
f^(4*x)*x*sqrt(-b/a)*log(f) + 2*a*b*f^(2*x)*x*sqrt(-b/a)*log(f) + a^2*x*sqr
t(-b/a)*log(f))*log(-f^x*sqrt(-b/a) + 1))/(a^2*b^3*f^(4*x)*log(f)^2 + 2*a^3
*b^2*f^(2*x)*log(f)^2 + a^4*b*log(f)^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^x x}{\left(bf^{2x} + a\right)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^x*x/(a+b*f^(2*x))^3,x, algorithm="giac")
```

```
[Out] integrate(f^x*x/(b*f^(2*x) + a)^3, x)
```

maple [A] time = 0.09, size = 223, normalized size = 1.00

$$\frac{3x\ln\left(\frac{-bf^x+\sqrt{-ab}}{\sqrt{-ab}}\right)}{16\sqrt{-ab}\ a^2\ln(f)}-\frac{3x\ln\left(\frac{bf^x+\sqrt{-ab}}{\sqrt{-ab}}\right)}{16\sqrt{-ab}\ a^2\ln(f)}+\frac{\left(3bx\,f^{2x}\ln(f)+5ax\ln(f)-b\,f^{2x}-a\right)f^x}{8\left(b\,f^{2x}+a\right)^2 a^2\ln(f)^2}+\frac{3\,\mathrm{dilog}\left(\frac{-bf^x+\sqrt{-ab}}{\sqrt{-ab}}\right)}{16\sqrt{-ab}\ a^2\ln(f)^2}-\frac{3\,\mathrm{dilo}}{16\sqrt{-}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^x*x/(b*f^(2*x)+a)^3,x)
```

```
[Out] 1/8*f^x*(3*ln(f)*b*x*(f^x)^2+5*ln(f)*a*x-b*(f^x)^2-a)/ln(f)^2/a^2/(a+b*(f^x
)^2)^2-1/2/ln(f)^2/a^2/(a*b)^(1/2)*arctan(1/(a*b)^(1/2)*b*f^x)+3/16/ln(f)/a
^2*x/(-a*b)^(1/2)*ln((-b*f^x+(-a*b)^(1/2))/(-a*b)^(1/2))-3/16/ln(f)/a^2*x/(
-a*b)^(1/2)*ln((b*f^x+(-a*b)^(1/2))/(-a*b)^(1/2))+3/16/ln(f)^2/a^2/(-a*b)^(
1/2)*dilog((-b*f^x+(-a*b)^(1/2))/(-a*b)^(1/2))-3/16/ln(f)^2/a^2/(-a*b)^(1/2
)*dilog((b*f^x+(-a*b)^(1/2))/(-a*b)^(1/2))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\left(3\,bx\log(f)-b\right)f^{3\,x}+\left(5\,ax\log(f)-a\right)f^x}{8\left(a^2b^2f^{4\,x}\log(f)^2+2\,a^3bf^{2\,x}\log(f)^2+a^4\log(f)^2\right)}+\int \frac{\left(3\,x\log(f)-4\right)f^x}{8\left(a^2bf^{2\,x}\log(f)+a^3\log(f)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^x*x/(a+b*f^(2*x))^3,x, algorithm="maxima")
```

```
[Out] 1/8*((3*b*x*log(f) - b)*f^(3*x) + (5*a*x*log(f) - a)*f^x)/(a^2*b^2*f^(4*x)*
log(f)^2 + 2*a^3*b*f^(2*x)*log(f)^2 + a^4*log(f)^2) + integrate(1/8*(3*x*lo
g(f) - 4)*f^x/(a^2*b*f^(2*x)*log(f) + a^3*log(f)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{f^x\,x}{\left(a+b\,f^{2\,x}\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f^x*x)/(a + b*f^(2*x))^3,x)
```

```
[Out] int((f^x*x)/(a + b*f^(2*x))^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{f^{3x}\left(3bx\log{(f)}-b\right)+f^{x}\left(5ax\log{(f)}-a\right)}{8a^{4}\log{(f)}^{2}+16a^{3}bf^{2x}\log{(f)}^{2}+8a^{2}b^{2}f^{4x}\log{(f)}^{2}}+\frac{\int\left(-\frac{4f^{x}}{a+bf^{2x}}\right)dx+\int\frac{3f^{x}x\log{(f)}}{a+bf^{2x}}\,dx}{8a^{2}\log{(f)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**x*x/(a+b*f**(2*x))**3,x)
```

```
[Out] (f**(3*x)*(3*b*x*log(f) - b) + f**x*(5*a*x*log(f) - a))/(8*a**4*log(f)**2 +
 16*a**3*b*f**(2*x)*log(f)**2 + 8*a**2*b**2*f**(4*x)*log(f)**2) + (Integral
(-4*f**x/(a + b*f**(2*x)), x) + Integral(3*f**x*x*log(f)/(a + b*f**(2*x)),
x))/(8*a**2*log(f))
```

3.53 $\int \frac{f^x x^2}{\left(a+bf^{2x}\right)^3}\, dx$

Optimal. Leaf size=420

$$\frac{i\mathrm{Li}_2\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{5/2}\sqrt{b}\log^3(f)}-\frac{i\mathrm{Li}_2\left(\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{5/2}\sqrt{b}\log^3(f)}+\frac{3i\mathrm{Li}_3\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{8a^{5/2}\sqrt{b}\log^3(f)}-\frac{3i\mathrm{Li}_3\left(\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{8a^{5/2}\sqrt{b}\log^3(f)}-\frac{3ix\mathrm{Li}_2\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{8a^{5/2}\sqrt{b}\log^2(f)}+\frac{3ix\mathrm{Li}_2\left(\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{8a^{5/2}\sqrt{b}\log^2(f)}+\cdots$$

```
[Out] -1/4*f^x*x/a^2/(a+b*f^(2*x))/ln(f)^2+1/4*f^x*x^2/a/(a+b*f^(2*x))^2/ln(f)+3/
8*f^x*x^2/a^2/(a+b*f^(2*x))/ln(f)+1/4*arctan(f^x*b^(1/2)/a^(1/2))/a^(5/2)/l
n(f)^3/b^(1/2)-x*arctan(f^x*b^(1/2)/a^(1/2))/a^(5/2)/ln(f)^2/b^(1/2)+3/8*x^
2*arctan(f^x*b^(1/2)/a^(1/2))/a^(5/2)/ln(f)/b^(1/2)+1/2*I*polylog(2,-I*f^x*
b^(1/2)/a^(1/2))/a^(5/2)/ln(f)^3/b^(1/2)-3/8*I*x*polylog(2,-I*f^x*b^(1/2)/a
^(1/2))/a^(5/2)/ln(f)^2/b^(1/2)-1/2*I*polylog(2,I*f^x*b^(1/2)/a^(1/2))/a^(5
/2)/ln(f)^3/b^(1/2)+3/8*I*x*polylog(2,I*f^x*b^(1/2)/a^(1/2))/a^(5/2)/ln(f)^
2/b^(1/2)+3/8*I*polylog(3,-I*f^x*b^(1/2)/a^(1/2))/a^(5/2)/ln(f)^3/b^(1/2)-3
/8*I*polylog(3,I*f^x*b^(1/2)/a^(1/2))/a^(5/2)/ln(f)^3/b^(1/2)
```

Rubi [A] time = 0.58, antiderivative size = 420, normalized size of antiderivative = 1.00, number of steps used = 24, number of rules used = 12, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.667, Rules used = {2249, 199, 205, 2245, 14, 2282, 4848, 2391, 12, 5143, 2531, 6589}

$$-\frac{3ix\mathrm{PolyLog}\left(2,-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{8a^{5/2}\sqrt{b}\log^2(f)}+\frac{i\mathrm{PolyLog}\left(2,-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{5/2}\sqrt{b}\log^3(f)}+\frac{3ix\mathrm{PolyLog}\left(2,\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{8a^{5/2}\sqrt{b}\log^2(f)}-\frac{i\mathrm{PolyLog}\left(2,\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)}{2a^{5/2}\sqrt{b}\log^3(f)}+\frac{3i\mathrm{PolyLog}\left(\cdots\right)}{8a^{5/2}\sqrt{b}\,\cdots}$$

Antiderivative was successfully verified.

```
[In] Int[(f^x*x^2)/(a + b*f^(2*x))^3,x]
```

```
[Out] ArcTan[(Sqrt[b]*f^x)/Sqrt[a]]/(4*a^(5/2)*Sqrt[b]*Log[f]^3) - (f^x*x)/(4*a^2
*(a + b*f^(2*x))*Log[f]^2) - (x*ArcTan[(Sqrt[b]*f^x)/Sqrt[a]])/(a^(5/2)*Sqr
t[b]*Log[f]^2) + (f^x*x^2)/(4*a*(a + b*f^(2*x))^2*Log[f]) + (3*f^x*x^2)/(8*
a^2*(a + b*f^(2*x))*Log[f]) + (3*x^2*ArcTan[(Sqrt[b]*f^x)/Sqrt[a]])/(8*a^(5
/2)*Sqrt[b]*Log[f]) + ((I/2)*PolyLog[2, ((-I)*Sqrt[b]*f^x)/Sqrt[a]])/(a^(5/
2)*Sqrt[b]*Log[f]^3) - (((3*I)/8)*x*PolyLog[2, ((-I)*Sqrt[b]*f^x)/Sqrt[a]])
/(a^(5/2)*Sqrt[b]*Log[f]^2) - ((I/2)*PolyLog[2, (I*Sqrt[b]*f^x)/Sqrt[a]])/(
a^(5/2)*Sqrt[b]*Log[f]^3) + (((3*I)/8)*x*PolyLog[2, (I*Sqrt[b]*f^x)/Sqrt[a]
])/(a^(5/2)*Sqrt[b]*Log[f]^2) + (((3*I)/8)*PolyLog[3, ((-I)*Sqrt[b]*f^x)/Sq
rt[a]])/(a^(5/2)*Sqrt[b]*Log[f]^3) - (((3*I)/8)*PolyLog[3, (I*Sqrt[b]*f^x)/
Sqrt[a]])/(a^(5/2)*Sqrt[b]*Log[f]^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2245

```
Int[(F_)^((e_.)*((c_.) + (d_.)*(x_)))*((a_.) + (b_.)*(F_)^(v_))^(p_)*(x_)^(
m_.), x_Symbol] :> With[{u = IntHide[F^(e*(c + d*x))*(a + b*F^v)^p, x]}, Di
st[x^m, u, x] - Dist[m, Int[x^(m - 1)*u, x], x]] /; FreeQ[{F, a, b, c, d, e
}, x] && EqQ[v, 2*e*(c + d*x)] && GtQ[m, 0] && ILtQ[p, 0]
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
```

```
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 5143

```
Int[ArcTan[(a_.) + (b_.)*(f_)^((c_.) + (d_.)*(x_))]*(x_)^(m_.), x_Symbol] :
> Dist[I/2, Int[x^m*Log[1 - I*a - I*b*f^(c + d*x)], x], x] - Dist[I/2, Int[
x^m*Log[1 + I*a + I*b*f^(c + d*x)], x], x] /; FreeQ[{a, b, c, d, f}, x] &&
IntegerQ[m] && m > 0
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{f^x x^2}{\left(a+bf^{2x}\right)^3}\,dx = \frac{f^x x^2}{4a\left(a+bf^{2x}\right)^2\log(f)} + \frac{3f^x x^2}{8a^2\left(a+bf^{2x}\right)\log(f)} + \frac{3x^2\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{8a^{5/2}\sqrt{b}\log(f)} - 2\int x\left(\frac{f^x}{4a\left(a+bf^{2x}\right)^2\,\ldots}\right.$$

$$= \frac{f^x x^2}{4a\left(a+bf^{2x}\right)^2\log(f)} + \frac{3f^x x^2}{8a^2\left(a+bf^{2x}\right)\log(f)} + \frac{3x^2\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{8a^{5/2}\sqrt{b}\log(f)} - 2\int\left(\frac{f^x x}{4a\left(a+bf^{2x}\right)^2\,\mathrm{lo}\ldots}\right.$$

$$= \frac{f^x x^2}{4a\left(a+bf^{2x}\right)^2\log(f)} + \frac{3f^x x^2}{8a^2\left(a+bf^{2x}\right)\log(f)} + \frac{3x^2\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{8a^{5/2}\sqrt{b}\log(f)} - \frac{3\int\frac{f^x x}{a+bf^{2x}}\,dx}{4a^2\log(f)} - \frac{\int\frac{f^{x}\ldots}{(a+b\ldots}}{2a\,\mathrm{lo}\ldots}$$

$$= -\frac{f^x x}{4a^2\left(a+bf^{2x}\right)\log^2(f)} - \frac{x\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{a^{5/2}\sqrt{b}\log^2(f)} + \frac{f^x x^2}{4a\left(a+bf^{2x}\right)^2\log(f)} + \frac{3f^x x^2}{8a^2\left(a+bf^{2x}\right)\log(f)}\ldots$$

$$= -\frac{f^x x}{4a^2\left(a+bf^{2x}\right)\log^2(f)} - \frac{x\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{a^{5/2}\sqrt{b}\log^2(f)} + \frac{f^x x^2}{4a\left(a+bf^{2x}\right)^2\log(f)} + \frac{3f^x x^2}{8a^2\left(a+bf^{2x}\right)\log(f)}\ldots$$

$$= -\frac{f^x x}{4a^2\left(a+bf^{2x}\right)\log^2(f)} - \frac{x\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{a^{5/2}\sqrt{b}\log^2(f)} + \frac{f^x x^2}{4a\left(a+bf^{2x}\right)^2\log(f)} + \frac{3f^x x^2}{8a^2\left(a+bf^{2x}\right)\log(f)}\ldots$$

$$= \frac{\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{4a^{5/2}\sqrt{b}\log^3(f)} - \frac{f^x x}{4a^2\left(a+bf^{2x}\right)\log^2(f)} - \frac{x\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{a^{5/2}\sqrt{b}\log^2(f)} + \frac{f^x x^2}{4a\left(a+bf^{2x}\right)^2\log(f)} + \frac{\ldots}{8a^2\ldots}$$

$$= \frac{\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{4a^{5/2}\sqrt{b}\log^3(f)} - \frac{f^x x}{4a^2\left(a+bf^{2x}\right)\log^2(f)} - \frac{x\tan^{-1}\left(\frac{\sqrt{b}f^x}{\sqrt{a}}\right)}{a^{5/2}\sqrt{b}\log^2(f)} + \frac{f^x x^2}{4a\left(a+bf^{2x}\right)^2\log(f)} + \frac{\ldots}{8a^2\ldots}$$

Mathematica [A] time = 0.50, size = 353, normalized size = 0.84

$$\frac{\frac{3i\left(2\mathrm{Li}_3\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)-2\mathrm{Li}_3\left(\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)-2x\log(f)\mathrm{Li}_2\left(-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)+2x\log(f)\mathrm{Li}_2\left(\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)+x^2\log^2(f)\log\left(1-\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)-x^2\log^2(f)\log\left(1+\frac{i\sqrt{b}f^x}{\sqrt{a}}\right)\right)}{\sqrt{a}\sqrt{b}} - \frac{8i\left(-\mathrm{Li}_2\left(-\frac{i\ldots}{\ldots}\right.\right.}{\ldots}}{16a^2\log^3(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f^x*x^2)/(a + b*f^(2*x))^3,x]
```

```
[Out] ((4*ArcTan[(Sqrt[b]*f^x)/Sqrt[a]])/(Sqrt[a]*Sqrt[b]) + (4*a*f^x*x^2*Log[f]^
2)/(a + b*f^(2*x))^2 + (2*f^x*x*Log[f]*(-2 + 3*x*Log[f]))/(a + b*f^(2*x)) -
 ((8*I)*(x*Log[f]*(Log[1 - (I*Sqrt[b]*f^x)/Sqrt[a]] - Log[1 + (I*Sqrt[b]*f^
x)/Sqrt[a]]) - PolyLog[2, ((-I)*Sqrt[b]*f^x)/Sqrt[a]] + PolyLog[2, (I*Sqrt[
b]*f^x)/Sqrt[a]]))/(Sqrt[a]*Sqrt[b]) + ((3*I)*(x^2*Log[f]^2*Log[1 - (I*Sqrt
[b]*f^x)/Sqrt[a]] - x^2*Log[f]^2*Log[1 + (I*Sqrt[b]*f^x)/Sqrt[a]] - 2*x*Log
[f]*PolyLog[2, ((-I)*Sqrt[b]*f^x)/Sqrt[a]] + 2*x*Log[f]*PolyLog[2, (I*Sqrt[
b]*f^x)/Sqrt[a]] + 2*PolyLog[3, ((-I)*Sqrt[b]*f^x)/Sqrt[a]] - 2*PolyLog[3,
(I*Sqrt[b]*f^x)/Sqrt[a]]))/(Sqrt[a]*Sqrt[b]))/(16*a^2*Log[f]^3)
```

fricas [C] time = 0.45, size = 786, normalized size = 1.87

$$\frac{2\left(3\,b^2x^2\log(f)^2-2\,b^2x\log(f)\right)f^{3\,x}+2\left(5\,abx^2\log(f)^2-2\,abx\log(f)\right)f^{x}+2\left(\left(3\,b^2x\log(f)-4\,b^2\right)f^{4\,x}\sqrt{-\frac{b}{a}}+\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^x*x^2/(a+b*f^(2*x))^3,x, algorithm="fricas")
```

```
[Out] 1/16*(2*(3*b^2*x^2*log(f)^2 - 2*b^2*x*log(f))*f^(3*x) + 2*(5*a*b*x^2*log(f)
^2 - 2*a*b*x*log(f))*f^x + 2*((3*b^2*x*log(f) - 4*b^2)*f^(4*x)*sqrt(-b/a) +
 2*(3*a*b*x*log(f) - 4*a*b)*f^(2*x)*sqrt(-b/a) + (3*a^2*x*log(f) - 4*a^2)*s
qrt(-b/a))*dilog(f^x*sqrt(-b/a)) - 2*((3*b^2*x*log(f) - 4*b^2)*f^(4*x)*sqrt
(-b/a) + 2*(3*a*b*x*log(f) - 4*a*b)*f^(2*x)*sqrt(-b/a) + (3*a^2*x*log(f) -
4*a^2)*sqrt(-b/a))*dilog(-f^x*sqrt(-b/a)) + 2*(b^2*f^(4*x)*sqrt(-b/a) + 2*a
*b*f^(2*x)*sqrt(-b/a) + a^2*sqrt(-b/a))*log(2*b*f^x + 2*a*sqrt(-b/a)) - 2*(
b^2*f^(4*x)*sqrt(-b/a) + 2*a*b*f^(2*x)*sqrt(-b/a) + a^2*sqrt(-b/a))*log(2*b
*f^x - 2*a*sqrt(-b/a)) - ((3*b^2*x^2*log(f)^2 - 8*b^2*x*log(f))*f^(4*x)*sqr
t(-b/a) + 2*(3*a*b*x^2*log(f)^2 - 8*a*b*x*log(f))*f^(2*x)*sqrt(-b/a) + (3*a
^2*x^2*log(f)^2 - 8*a^2*x*log(f))*sqrt(-b/a))*log(f^x*sqrt(-b/a) + 1) + ((3
*b^2*x^2*log(f)^2 - 8*b^2*x*log(f))*f^(4*x)*sqrt(-b/a) + 2*(3*a*b*x^2*log(f
)^2 - 8*a*b*x*log(f))*f^(2*x)*sqrt(-b/a) + (3*a^2*x^2*log(f)^2 - 8*a^2*x*lo
g(f))*sqrt(-b/a))*log(-f^x*sqrt(-b/a) + 1) - 6*(b^2*f^(4*x)*sqrt(-b/a) + 2*
a*b*f^(2*x)*sqrt(-b/a) + a^2*sqrt(-b/a))*polylog(3, f^x*sqrt(-b/a)) + 6*(b^
2*f^(4*x)*sqrt(-b/a) + 2*a*b*f^(2*x)*sqrt(-b/a) + a^2*sqrt(-b/a))*polylog(3
, -f^x*sqrt(-b/a)))/(a^2*b^3*f^(4*x)*log(f)^3 + 2*a^3*b^2*f^(2*x)*log(f)^3
+ a^4*b*log(f)^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^x x^2}{\left(bf^{2\,x}+a\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^x*x^2/(a+b*f^(2*x))^3,x, algorithm="giac")
[Out] integrate(f^x*x^2/(b*f^(2*x) + a)^3, x)
```

maple [F] time = 0.21, size = 0, normalized size = 0.00

$$\int \frac{x^2 f^x}{\left(b f^{2x}+a\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^x*x^2/(b*f^(2*x)+a)^3,x)
[Out] int(f^x*x^2/(b*f^(2*x)+a)^3,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\left(3\,bx^2\log(f)-2\,bx\right)f^{3\,x}+\left(5\,ax^2\log(f)-2\,ax\right)f^x}{8\left(a^2b^2f^{4\,x}\log(f)^2+2\,a^3bf^{2\,x}\log(f)^2+a^4\log(f)^2\right)}+\int\frac{\left(3\,x^2\log(f)^2-8\,x\log(f)+2\right)f^x}{8\left(a^2bf^{2\,x}\log(f)^2+a^3\log(f)^2\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^x*x^2/(a+b*f^(2*x))^3,x, algorithm="maxima")
[Out] 1/8*((3*b*x^2*log(f) - 2*b*x)*f^(3*x) + (5*a*x^2*log(f) - 2*a*x)*f^x)/(a^2*
b^2*f^(4*x)*log(f)^2 + 2*a^3*b*f^(2*x)*log(f)^2 + a^4*log(f)^2) + integrate
(1/8*(3*x^2*log(f)^2 - 8*x*log(f) + 2)*f^x/(a^2*b*f^(2*x)*log(f)^2 + a^3*lo
g(f)^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{f^x\,x^2}{{\left(a+b\,f^{2\,x}\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f^x*x^2)/(a + b*f^(2*x))^3,x)
[Out] int((f^x*x^2)/(a + b*f^(2*x))^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{f^{3x}\left(3bx^2\log\left(f\right)-2bx\right)+f^x\left(5ax^2\log\left(f\right)-2ax\right)}{8a^4\log\left(f\right)^2+16a^3bf^{2x}\log\left(f\right)^2+8a^2b^2f^{4x}\log\left(f\right)^2}+\frac{\int\frac{2f^x}{a+bf^{2x}}\,dx+\int\left(-\frac{8f^xx\log\left(f\right)}{a+bf^{2x}}\right)dx+\int\frac{3f^xx^2\log\left(f\right)^2}{a+bf^{2x}}\,dx}{8a^2\log\left(f\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**x*x**2/(a+b*f**(2*x))**3,x)
```

```
[Out] (f**(3*x)*(3*b*x**2*log(f) - 2*b*x) + f**x*(5*a*x**2*log(f) - 2*a*x))/(8*a*
*4*log(f)**2 + 16*a**3*b*f**(2*x)*log(f)**2 + 8*a**2*b**2*f**(4*x)*log(f)**
2) + (Integral(2*f**x/(a + b*f**(2*x)), x) + Integral(-8*f**x*x*log(f)/(a +
 b*f**(2*x)), x) + Integral(3*f**x*x**2*log(f)**2/(a + b*f**(2*x)), x))/(8*
a**2*log(f)**2)
```

3.54 $\int \frac{1}{bf^{-x}+af^x}\,dx$

Optimal. Leaf size=30

$$\frac{\tan^{-1}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)}$$

```
[Out] arctan(f^x*a^(1/2)/b^(1/2))/ln(f)/a^(1/2)/b^(1/2)
```

Rubi [A] time = 0.02, antiderivative size = 30, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {2282, 205}

$$\frac{\tan^{-1}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[(b/f^x + a*f^x)^(-1),x]
```

```
[Out] ArcTan[(Sqrt[a]*f^x)/Sqrt[b]]/(Sqrt[a]*Sqrt[b]*Log[f])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}\int \frac{1}{bf^{-x}+af^x}\,dx &= \frac{\text{Subst}\left(\int \frac{1}{b+ax^2}\,dx,x,f^x\right)}{\log(f)}\\ &= \frac{\tan^{-1}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)}\end{aligned}$$

Mathematica [A] time = 0.01, size = 30, normalized size = 1.00

$$\frac{\tan^{-1}\left(\frac{\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(b/f^x + a*f^x)^(-1),x]
```

```
[Out] ArcTan[(Sqrt[a]*f^x)/Sqrt[b]]/(Sqrt[a]*Sqrt[b]*Log[f])
```

fricas [A] time = 0.41, size = 86, normalized size = 2.87

$$\left[-\frac{\sqrt{-ab}\log\left(\frac{af^{2x}-2\sqrt{-ab}f^x-b}{af^{2x}+b}\right)}{2ab\log(f)}, -\frac{\sqrt{ab}\arctan\left(\frac{\sqrt{ab}}{af^x}\right)}{ab\log(f)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b/(f^x)+a*f^x),x, algorithm="fricas")
```

```
[Out] [-1/2*sqrt(-a*b)*log((a*f^(2*x) - 2*sqrt(-a*b)*f^x - b)/(a*f^(2*x) + b))/(a
*b*log(f)), -sqrt(a*b)*arctan(sqrt(a*b)/(a*f^x))/(a*b*log(f))]
```

giac [A] time = 0.29, size = 21, normalized size = 0.70

$$\frac{\arctan\left(\frac{af^x}{\sqrt{ab}}\right)}{\sqrt{ab}\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b/(f^x)+a*f^x),x, algorithm="giac")
```

```
[Out] arctan(a*f^x/sqrt(a*b))/(sqrt(a*b)*log(f))
```

maple [A] time = 0.01, size = 22, normalized size = 0.73

$$\frac{\arctan\left(\frac{a f^x}{\sqrt{ab}}\right)}{\sqrt{ab}\,\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b/(f^x)+a*f^x),x)
```

```
[Out] 1/ln(f)/(a*b)^(1/2)*arctan(a*f^x/(a*b)^(1/2))
```

maxima [A] time = 0.97, size = 24, normalized size = 0.80

$$-\frac{\arctan\left(\frac{b}{\sqrt{ab}\,f^x}\right)}{\sqrt{ab}\,\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b/(f^x)+a*f^x),x, algorithm="maxima")
[Out] -arctan(b/(sqrt(a*b)*f^x))/(sqrt(a*b)*log(f))
```

mupad [B] time = 3.51, size = 21, normalized size = 0.70

$$\frac{\mathrm{atan}\left(\frac{a\,f^x}{\sqrt{a\,b}}\right)}{\ln(f)\,\sqrt{a\,b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b/f^x + a*f^x),x)
[Out] atan((a*f^x)/(a*b)^(1/2))/(log(f)*(a*b)^(1/2))
```

sympy [A] time = 0.19, size = 24, normalized size = 0.80

$$\frac{\operatorname{RootSum}\left(4z^2ab+1,\left(i\mapsto i\log\left(2ib+f^x\right)\right)\right)}{\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b/(f**x)+a*f**x),x)
[Out] RootSum(4*_z**2*a*b + 1, Lambda(_i, _i*log(2*_i*b + f**x)))/log(f)
```

3.55 $\int \frac{x}{bf^{-x}+af^x}\,dx$

Optimal. Leaf size=110

$$-\frac{i\text{Li}_2\left(-\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{2\sqrt{a}\,\sqrt{b}\,\log^2(f)}+\frac{i\text{Li}_2\left(\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{2\sqrt{a}\,\sqrt{b}\,\log^2(f)}+\frac{x\tan^{-1}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)}$$

```
[Out] x*arctan(f^x*a^(1/2)/b^(1/2))/ln(f)/a^(1/2)/b^(1/2)-1/2*I*polylog(2,-I*f^x*
a^(1/2)/b^(1/2))/ln(f)^2/a^(1/2)/b^(1/2)+1/2*I*polylog(2,I*f^x*a^(1/2)/b^(1
/2))/ln(f)^2/a^(1/2)/b^(1/2)
```

Rubi [A] time = 0.10, antiderivative size = 110, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.353, Rules used = {2282, 205, 2266, 12, 4848, 2391}

$$-\frac{i\text{PolyLog}\left(2,-\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{2\sqrt{a}\,\sqrt{b}\,\log^2(f)}+\frac{i\text{PolyLog}\left(2,\frac{i\sqrt{a}\,f^x}{\sqrt{b}}\right)}{2\sqrt{a}\,\sqrt{b}\,\log^2(f)}+\frac{x\tan^{-1}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[x/(b/f^x + a*f^x),x]
```

```
[Out] (x*ArcTan[(Sqrt[a]*f^x)/Sqrt[b]])/(Sqrt[a]*Sqrt[b]*Log[f]) - ((I/2)*PolyLog
[2, ((-I)*Sqrt[a]*f^x)/Sqrt[b]])/(Sqrt[a]*Sqrt[b]*Log[f]^2) + ((I/2)*PolyLo
g[2, (I*Sqrt[a]*f^x)/Sqrt[b]])/(Sqrt[a]*Sqrt[b]*Log[f]^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2266

```
Int[(x_)^(m_.)/((b_.)*(F_)^(v_) + (a_.)*(F_)^((c_.) + (d_.)*(x_))), x_Symbo
l] :> With[{u = IntHide[1/(a*F^(c + d*x) + b*F^v), x]}, Simp[x^m*u, x] - Di
st[m, Int[x^(m - 1)*u, x], x]] /; FreeQ[{F, a, b, c, d}, x] && EqQ[v, -(c +
 d*x)] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rubi steps

$$
\begin{aligned}
\int \frac{x}{bf^{-x}+af^x}\,dx &= \frac{x\tan^{-1}\left(\frac{\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log(f)}-\int \frac{\tan^{-1}\left(\frac{\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log(f)}\,dx\\
&= \frac{x\tan^{-1}\left(\frac{\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log(f)}-\frac{\int \tan^{-1}\left(\frac{\sqrt{a}f^x}{\sqrt{b}}\right)dx}{\sqrt{a}\sqrt{b}\log(f)}\\
&= \frac{x\tan^{-1}\left(\frac{\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log(f)}-\frac{\text{Subst}\left(\int \frac{\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{x}\,dx,x,f^x\right)}{\sqrt{a}\sqrt{b}\log^2(f)}\\
&= \frac{x\tan^{-1}\left(\frac{\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log(f)}-\frac{i\,\text{Subst}\left(\int \frac{\log\left(1-\frac{i\sqrt{a}x}{\sqrt{b}}\right)}{x}\,dx,x,f^x\right)}{2\sqrt{a}\sqrt{b}\log^2(f)}+\frac{i\,\text{Subst}\left(\int \frac{\log\left(1+\frac{i\sqrt{a}x}{\sqrt{b}}\right)}{x}\,dx,x,f^x\right)}{2\sqrt{a}\sqrt{b}\log^2(f)}\\
&= \frac{x\tan^{-1}\left(\frac{\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log(f)}-\frac{i\text{Li}_2\left(-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{2\sqrt{a}\sqrt{b}\log^2(f)}+\frac{i\text{Li}_2\left(\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{2\sqrt{a}\sqrt{b}\log^2(f)}
\end{aligned}
$$

Mathematica [A] time = 0.06, size = 108, normalized size = 0.98

$$\frac{i\left(-\text{Li}_2\left(-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)+\text{Li}_2\left(\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)+x\log(f)\left(\log\left(1-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)-\log\left(1+\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)\right)\right)}{2\sqrt{a}\sqrt{b}\log^2(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[x/(b/f^x + a*f^x),x]
```

```
[Out] ((I/2)*(x*Log[f]*(Log[1 - (I*Sqrt[a]*f^x)/Sqrt[b]] - Log[1 + (I*Sqrt[a]*f^x
)/Sqrt[b]]) - PolyLog[2, ((-I)*Sqrt[a]*f^x)/Sqrt[b]] + PolyLog[2, (I*Sqrt[a
]*f^x)/Sqrt[b]]))/(Sqrt[a]*Sqrt[b]*Log[f]^2)
```

fricas [A] time = 0.42, size = 112, normalized size = 1.02

$$-\frac{x\sqrt{-\frac{a}{b}}\log\left(f^x\sqrt{-\frac{a}{b}}+1\right)\log(f)-x\sqrt{-\frac{a}{b}}\log\left(-f^x\sqrt{-\frac{a}{b}}+1\right)\log(f)-\sqrt{-\frac{a}{b}}\,\text{Li}_2\left(f^x\sqrt{-\frac{a}{b}}\right)+\sqrt{-\frac{a}{b}}\,\text{Li}_2\left(-f^x\sqrt{-\frac{a}{b}}\right)}{2\,a\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(b/(f^x)+a*f^x),x, algorithm="fricas")
```

```
[Out] -1/2*(x*sqrt(-a/b)*log(f^x*sqrt(-a/b) + 1)*log(f) - x*sqrt(-a/b)*log(-f^x*s
qrt(-a/b) + 1)*log(f) - sqrt(-a/b)*dilog(f^x*sqrt(-a/b)) + sqrt(-a/b)*dilog
(-f^x*sqrt(-a/b)))/(a*log(f)^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{x}{af^x+\frac{b}{f^x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(b/(f^x)+a*f^x),x, algorithm="giac")
```

```
[Out] integrate(x/(a*f^x + b/f^x), x)
```

maple [A] time = 0.06, size = 134, normalized size = 1.22

$$\frac{x\ln\left(\frac{-af^x+\sqrt{-ab}}{\sqrt{-ab}}\right)}{2\sqrt{-ab}\,\ln(f)}-\frac{x\ln\left(\frac{af^x+\sqrt{-ab}}{\sqrt{-ab}}\right)}{2\sqrt{-ab}\,\ln(f)}+\frac{\text{dilog}\left(\frac{-af^x+\sqrt{-ab}}{\sqrt{-ab}}\right)}{2\sqrt{-ab}\,\ln(f)^2}-\frac{\text{dilog}\left(\frac{af^x+\sqrt{-ab}}{\sqrt{-ab}}\right)}{2\sqrt{-ab}\,\ln(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(b/(f^x)+a*f^x),x)
```

```
[Out] 1/2/ln(f)*x/(-a*b)^(1/2)*ln((-a*f^x+(-a*b)^(1/2))/(-a*b)^(1/2))-1/2/ln(f)*x
/(-a*b)^(1/2)*ln((a*f^x+(-a*b)^(1/2))/(-a*b)^(1/2))+1/2/ln(f)^2/(-a*b)^(1/2
)*dilog((-a*f^x+(-a*b)^(1/2))/(-a*b)^(1/2))-1/2/ln(f)^2/(-a*b)^(1/2)*dilog(
(a*f^x+(-a*b)^(1/2))/(-a*b)^(1/2))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{af^x + \frac{b}{f^x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(b/(f^x)+a*f^x),x, algorithm="maxima")
```

```
[Out] integrate(x/(a*f^x + b/f^x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x}{\frac{b}{f^x} + a\,f^x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(b/f^x + a*f^x),x)
```

```
[Out] int(x/(b/f^x + a*f^x), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^x x}{af^{2x} + b}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(b/(f**x)+a*f**x),x)
```

```
[Out] Integral(f**x*x/(a*f**(2*x) + b), x)
```

3.56 $\int \frac{x^2}{bf^{-x}+af^x}\,dx$

Optimal. Leaf size=184

$$\frac{i\text{Li}_3\left(-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log^3(f)}-\frac{i\text{Li}_3\left(\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log^3(f)}-\frac{ix\text{Li}_2\left(-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log^2(f)}+\frac{ix\text{Li}_2\left(\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log^2(f)}+\frac{x^2\tan^{-1}\left(\frac{\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log(f)}$$

```
[Out] x^2*arctan(f^x*a^(1/2)/b^(1/2))/ln(f)/a^(1/2)/b^(1/2)-I*x*polylog(2,-I*f^x*
a^(1/2)/b^(1/2))/ln(f)^2/a^(1/2)/b^(1/2)+I*x*polylog(2,I*f^x*a^(1/2)/b^(1/2
))/ln(f)^2/a^(1/2)/b^(1/2)+I*polylog(3,-I*f^x*a^(1/2)/b^(1/2))/ln(f)^3/a^(1
/2)/b^(1/2)-I*polylog(3,I*f^x*a^(1/2)/b^(1/2))/ln(f)^3/a^(1/2)/b^(1/2)
```

Rubi [A] time = 0.17, antiderivative size = 184, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.368, Rules used = {2282, 205, 2266, 12, 5143, 2531, 6589}

$$-\frac{ix\text{PolyLog}\left(2,-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log^2(f)}+\frac{ix\text{PolyLog}\left(2,\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log^2(f)}+\frac{i\text{PolyLog}\left(3,-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log^3(f)}-\frac{i\text{PolyLog}\left(3,\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log^3(f)}+\frac{x^2\tan^{-1}\left(\frac{\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/(b/f^x + a*f^x),x]
```

```
[Out] (x^2*ArcTan[(Sqrt[a]*f^x)/Sqrt[b]])/(Sqrt[a]*Sqrt[b]*Log[f]) - (I*x*PolyLog
[2, ((-I)*Sqrt[a]*f^x)/Sqrt[b]])/(Sqrt[a]*Sqrt[b]*Log[f]^2) + (I*x*PolyLog[
2, (I*Sqrt[a]*f^x)/Sqrt[b]])/(Sqrt[a]*Sqrt[b]*Log[f]^2) + (I*PolyLog[3, ((-
I)*Sqrt[a]*f^x)/Sqrt[b]])/(Sqrt[a]*Sqrt[b]*Log[f]^3) - (I*PolyLog[3, (I*Sqr
t[a]*f^x)/Sqrt[b]])/(Sqrt[a]*Sqrt[b]*Log[f]^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2266

```
Int[(x_)^(m_.)/((b_.)*(F_)^(v_) + (a_.)*(F_)^((c_.) + (d_.)*(x_))), x_Symbo
l] :> With[{u = IntHide[1/(a*F^(c + d*x) + b*F^v), x]}, Simp[x^m*u, x] - Di
```

```
st[m, Int[x^(m - 1)*u, x], x]] /; FreeQ[{F, a, b, c, d}, x] && EqQ[v, -(c +
 d*x)] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 5143

```
Int[ArcTan[(a_.) + (b_.)*(f_)^((c_.) + (d_.)*(x_))]*(x_)^(m_.), x_Symbol] :
> Dist[I/2, Int[x^m*Log[1 - I*a - I*b*f^(c + d*x)], x], x] - Dist[I/2, Int[
x^m*Log[1 + I*a + I*b*f^(c + d*x)], x], x] /; FreeQ[{a, b, c, d, f}, x] &&
IntegerQ[m] && m > 0
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x^2}{bf^{-x}+af^x}\,dx = \frac{x^2\tan^{-1}\left(\frac{\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log(f)} - 2\int \frac{x\tan^{-1}\left(\frac{\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log(f)}\,dx$$

$$= \frac{x^2\tan^{-1}\left(\frac{\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log(f)} - \frac{2\int x\tan^{-1}\left(\frac{\sqrt{a}f^x}{\sqrt{b}}\right)dx}{\sqrt{a}\sqrt{b}\log(f)}$$

$$= \frac{x^2\tan^{-1}\left(\frac{\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log(f)} - \frac{i\int x\log\left(1-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)dx}{\sqrt{a}\sqrt{b}\log(f)} + \frac{i\int x\log\left(1+\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)dx}{\sqrt{a}\sqrt{b}\log(f)}$$

$$= \frac{x^2\tan^{-1}\left(\frac{\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log(f)} - \frac{ix\text{Li}_2\left(-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log^2(f)} + \frac{ix\text{Li}_2\left(\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log^2(f)} + \frac{i\int \text{Li}_2\left(-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)dx}{\sqrt{a}\sqrt{b}\log^2(f)} - \frac{i\int \text{Li}_2\left(\frac{i\sqrt{a}f\right.}{\sqrt{b}\right.}}{\sqrt{a}\sqrt{b}\log}$$

$$= \frac{x^2\tan^{-1}\left(\frac{\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log(f)} - \frac{ix\text{Li}_2\left(-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log^2(f)} + \frac{ix\text{Li}_2\left(\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log^2(f)} + \frac{i\,\text{Subst}\left(\int \frac{\text{Li}_2\left(-\frac{i\sqrt{a}x}{\sqrt{b}}\right)}{x}dx, x, f^x\right)}{\sqrt{a}\sqrt{b}\log^3(f)} - \frac{i\,\text{S}}{}$$

$$= \frac{x^2\tan^{-1}\left(\frac{\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log(f)} - \frac{ix\text{Li}_2\left(-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log^2(f)} + \frac{ix\text{Li}_2\left(\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log^2(f)} + \frac{i\text{Li}_3\left(-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log^3(f)} - \frac{i\text{Li}_3\left(\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log^3(f)}$$

Mathematica [A] time = 0.05, size = 168, normalized size = 0.91

$$\frac{i\left(2\text{Li}_3\left(-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right) - 2\text{Li}_3\left(\frac{i\sqrt{a}f^x}{\sqrt{b}}\right) - 2x\log(f)\text{Li}_2\left(-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right) + 2x\log(f)\text{Li}_2\left(\frac{i\sqrt{a}f^x}{\sqrt{b}}\right) + x^2\log^2(f)\log\left(1-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right) - \right.}{2\sqrt{a}\sqrt{b}\log^3(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/(b/f^x + a*f^x),x]
```

```
[Out] ((I/2)*(x^2*Log[f]^2*Log[1 - (I*Sqrt[a]*f^x)/Sqrt[b]] - x^2*Log[f]^2*Log[1
+ (I*Sqrt[a]*f^x)/Sqrt[b]] - 2*x*Log[f]*PolyLog[2, ((-I)*Sqrt[a]*f^x)/Sqrt[
b]] + 2*x*Log[f]*PolyLog[2, (I*Sqrt[a]*f^x)/Sqrt[b]] + 2*PolyLog[3, ((-I)*S
qrt[a]*f^x)/Sqrt[b]] - 2*PolyLog[3, (I*Sqrt[a]*f^x)/Sqrt[b]]))/(Sqrt[a]*Sqr
t[b]*Log[f]^3)
```

fricas [C] time = 0.42, size = 176, normalized size = 0.96

$$-\frac{x^2\sqrt{-\frac{a}{b}}\log\left(f^x\sqrt{-\frac{a}{b}}+1\right)\log(f)^2 - x^2\sqrt{-\frac{a}{b}}\log\left(-f^x\sqrt{-\frac{a}{b}}+1\right)\log(f)^2 - 2x\sqrt{-\frac{a}{b}}\text{Li}_2\left(f^x\sqrt{-\frac{a}{b}}\right)\log(f) + 2x}{2a\log(f)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(b/(f^x)+a*f^x),x, algorithm="fricas")
```

```
[Out] -1/2*(x^2*sqrt(-a/b)*log(f^x*sqrt(-a/b) + 1)*log(f)^2 - x^2*sqrt(-a/b)*log(
-f^x*sqrt(-a/b) + 1)*log(f)^2 - 2*x*sqrt(-a/b)*dilog(f^x*sqrt(-a/b))*log(f)
 + 2*x*sqrt(-a/b)*dilog(-f^x*sqrt(-a/b))*log(f) + 2*sqrt(-a/b)*polylog(3, f
^x*sqrt(-a/b)) - 2*sqrt(-a/b)*polylog(3, -f^x*sqrt(-a/b)))/(a*log(f)^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{af^x + \frac{b}{f^x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(b/(f^x)+a*f^x),x, algorithm="giac")
```

```
[Out] integrate(x^2/(a*f^x + b/f^x), x)
```

maple [F] time = 0.05, size = 0, normalized size = 0.00

$$\int \frac{x^2}{a\,f^x + b\,f^{-x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(b/(f^x)+a*f^x),x)
```

```
[Out] int(x^2/(b/(f^x)+a*f^x),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{af^x + \frac{b}{f^x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(b/(f^x)+a*f^x),x, algorithm="maxima")
```

```
[Out] integrate(x^2/(a*f^x + b/f^x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2}{\frac{b}{f^x} + a\,f^x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(b/f^x + a*f^x),x)
```

```
[Out] int(x^2/(b/f^x + a*f^x), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^x x^2}{a f^{2x} + b} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(b/(f**x)+a*f**x),x)
```

```
[Out] Integral(f**x*x**2/(a*f**(2*x) + b), x)
```

3.57 $\int \frac{x^3}{bf^{-x}+af^x}\,dx$

Optimal. Leaf size=268

$$-\frac{3ix^2\text{Li}_2\left(-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{2\sqrt{a}\sqrt{b}\log^2(f)}+\frac{3ix^2\text{Li}_2\left(\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{2\sqrt{a}\sqrt{b}\log^2(f)}-\frac{3i\text{Li}_4\left(-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log^4(f)}+\frac{3i\text{Li}_4\left(\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log^4(f)}+\frac{3ix\text{Li}_3\left(-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log^3(f)}-\frac{3ix\text{Li}_3\left(\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log^3(f)}+\frac{x^3\,\text{ta}}{\sqrt{a}}$$

```
[Out] x^3*arctan(f^x*a^(1/2)/b^(1/2))/ln(f)/a^(1/2)/b^(1/2)-3/2*I*x^2*polylog(2,-
I*f^x*a^(1/2)/b^(1/2))/ln(f)^2/a^(1/2)/b^(1/2)+3/2*I*x^2*polylog(2,I*f^x*a^
(1/2)/b^(1/2))/ln(f)^2/a^(1/2)/b^(1/2)+3*I*x*polylog(3,-I*f^x*a^(1/2)/b^(1/
2))/ln(f)^3/a^(1/2)/b^(1/2)-3*I*x*polylog(3,I*f^x*a^(1/2)/b^(1/2))/ln(f)^3/
a^(1/2)/b^(1/2)-3*I*polylog(4,-I*f^x*a^(1/2)/b^(1/2))/ln(f)^4/a^(1/2)/b^(1/
2)+3*I*polylog(4,I*f^x*a^(1/2)/b^(1/2))/ln(f)^4/a^(1/2)/b^(1/2)
```

Rubi [A] time = 0.22, antiderivative size = 268, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 8, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.421, Rules used = {2282, 205, 2266, 12, 5143, 2531, 6609, 6589}

$$-\frac{3ix^2\text{PolyLog}\left(2,-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{2\sqrt{a}\sqrt{b}\log^2(f)}+\frac{3ix^2\text{PolyLog}\left(2,\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{2\sqrt{a}\sqrt{b}\log^2(f)}+\frac{3ix\text{PolyLog}\left(3,-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log^3(f)}-\frac{3ix\text{PolyLog}\left(3,\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log^3(f)}-\frac{3i\text{PolyI}}{\sqrt{a}}$$

Antiderivative was successfully verified.

```
[In] Int[x^3/(b/f^x + a*f^x),x]
```

```
[Out] (x^3*ArcTan[(Sqrt[a]*f^x)/Sqrt[b]])/(Sqrt[a]*Sqrt[b]*Log[f]) - (((3*I)/2)*x
^2*PolyLog[2, ((-I)*Sqrt[a]*f^x)/Sqrt[b]])/(Sqrt[a]*Sqrt[b]*Log[f]^2) + (((
3*I)/2)*x^2*PolyLog[2, (I*Sqrt[a]*f^x)/Sqrt[b]])/(Sqrt[a]*Sqrt[b]*Log[f]^2)
 + ((3*I)*x*PolyLog[3, ((-I)*Sqrt[a]*f^x)/Sqrt[b]])/(Sqrt[a]*Sqrt[b]*Log[f]
^3) - ((3*I)*x*PolyLog[3, (I*Sqrt[a]*f^x)/Sqrt[b]])/(Sqrt[a]*Sqrt[b]*Log[f]
^3) - ((3*I)*PolyLog[4, ((-I)*Sqrt[a]*f^x)/Sqrt[b]])/(Sqrt[a]*Sqrt[b]*Log[f
]^4) + ((3*I)*PolyLog[4, (I*Sqrt[a]*f^x)/Sqrt[b]])/(Sqrt[a]*Sqrt[b]*Log[f]^
4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2266

```
Int[(x_)^(m_.)/((b_.)*(F_)^(v_) + (a_.)*(F_)^((c_.) + (d_.)*(x_))), x_Symbo
l] :> With[{u = IntHide[1/(a*F^(c + d*x) + b*F^v), x]}, Simp[x^m*u, x] - Di
st[m, Int[x^(m - 1)*u, x], x]] /; FreeQ[{F, a, b, c, d}, x] && EqQ[v, -(c +
 d*x)] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 5143

```
Int[ArcTan[(a_.) + (b_.)*(f_)^((c_.) + (d_.)*(x_))]*(x_)^(m_.), x_Symbol] :
> Dist[I/2, Int[x^m*Log[1 - I*a - I*b*f^(c + d*x)], x], x] - Dist[I/2, Int[
x^m*Log[1 + I*a + I*b*f^(c + d*x)], x], x] /; FreeQ[{a, b, c, d, f}, x] &&
IntegerQ[m] && m > 0
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\int \frac{x^3}{bf^{-x}+af^x}\,dx = \frac{x^3\tan^{-1}\left(\frac{\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log(f)} - 3\int \frac{x^2\tan^{-1}\left(\frac{\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log(f)}\,dx$$

$$= \frac{x^3\tan^{-1}\left(\frac{\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log(f)} - \frac{3\int x^2\tan^{-1}\left(\frac{\sqrt{a}f^x}{\sqrt{b}}\right)dx}{\sqrt{a}\sqrt{b}\log(f)}$$

$$= \frac{x^3\tan^{-1}\left(\frac{\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log(f)} - \frac{(3i)\int x^2\log\left(1-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)dx}{2\sqrt{a}\sqrt{b}\log(f)} + \frac{(3i)\int x^2\log\left(1+\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)dx}{2\sqrt{a}\sqrt{b}\log(f)}$$

$$= \frac{x^3\tan^{-1}\left(\frac{\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log(f)} - \frac{3ix^2\text{Li}_2\left(-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{2\sqrt{a}\sqrt{b}\log^2(f)} + \frac{3ix^2\text{Li}_2\left(\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{2\sqrt{a}\sqrt{b}\log^2(f)} + \frac{(3i)\int x\text{Li}_2\left(-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)dx}{\sqrt{a}\sqrt{b}\log^2(f)} - \frac{(3i)\int x}{\sqrt{a}}$$

$$= \frac{x^3\tan^{-1}\left(\frac{\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log(f)} - \frac{3ix^2\text{Li}_2\left(-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{2\sqrt{a}\sqrt{b}\log^2(f)} + \frac{3ix^2\text{Li}_2\left(\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{2\sqrt{a}\sqrt{b}\log^2(f)} + \frac{3ix\text{Li}_3\left(-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log^3(f)} - \frac{3ix\text{Li}_3\left(\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log^3(f)}$$

$$= \frac{x^3\tan^{-1}\left(\frac{\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log(f)} - \frac{3ix^2\text{Li}_2\left(-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{2\sqrt{a}\sqrt{b}\log^2(f)} + \frac{3ix^2\text{Li}_2\left(\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{2\sqrt{a}\sqrt{b}\log^2(f)} + \frac{3ix\text{Li}_3\left(-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log^3(f)} - \frac{3ix\text{Li}_3\left(\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log^3(f)}$$

$$= \frac{x^3\tan^{-1}\left(\frac{\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log(f)} - \frac{3ix^2\text{Li}_2\left(-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{2\sqrt{a}\sqrt{b}\log^2(f)} + \frac{3ix^2\text{Li}_2\left(\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{2\sqrt{a}\sqrt{b}\log^2(f)} + \frac{3ix\text{Li}_3\left(-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log^3(f)} - \frac{3ix\text{Li}_3\left(\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}\log^3(f)}$$

Mathematica [A] time = 0.05, size = 224, normalized size = 0.84

$$\frac{i\left(-3x^2\log^2(f)\text{Li}_2\left(-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)+3x^2\log^2(f)\text{Li}_2\left(\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)-6\text{Li}_4\left(-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)+6\text{Li}_4\left(\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)+6x\log(f)\text{Li}_3\left(-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)-\right.}{2\sqrt{a}\sqrt{b}\log^4(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3/(b/f^x + a*f^x),x]
```

```
[Out] ((I/2)*(x^3*Log[f]^3*Log[1 - (I*Sqrt[a]*f^x)/Sqrt[b]] - x^3*Log[f]^3*Log[1
+ (I*Sqrt[a]*f^x)/Sqrt[b]] - 3*x^2*Log[f]^2*PolyLog[2, ((-I)*Sqrt[a]*f^x)/S
qrt[b]] + 3*x^2*Log[f]^2*PolyLog[2, (I*Sqrt[a]*f^x)/Sqrt[b]] + 6*x*Log[f]*P
olyLog[3, ((-I)*Sqrt[a]*f^x)/Sqrt[b]] - 6*x*Log[f]*PolyLog[3, (I*Sqrt[a]*f^
x)/Sqrt[b]] - 6*PolyLog[4, ((-I)*Sqrt[a]*f^x)/Sqrt[b]] + 6*PolyLog[4, (I*Sq
rt[a]*f^x)/Sqrt[b]]))/(Sqrt[a]*Sqrt[b]*Log[f]^4)
```

fricas [C] time = 0.43, size = 239, normalized size = 0.89

$$-\frac{x^3\sqrt{-\frac{a}{b}}\log\left(f^x\sqrt{-\frac{a}{b}}+1\right)\log(f)^3 - x^3\sqrt{-\frac{a}{b}}\log\left(-f^x\sqrt{-\frac{a}{b}}+1\right)\log(f)^3 - 3\,x^2\sqrt{-\frac{a}{b}}\,\mathrm{Li}_2\left(f^x\sqrt{-\frac{a}{b}}\right)\log(f)^2 + 3}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(b/(f^x)+a*f^x),x, algorithm="fricas")
```

```
[Out] -1/2*(x^3*sqrt(-a/b)*log(f^x*sqrt(-a/b) + 1)*log(f)^3 - x^3*sqrt(-a/b)*log(
-f^x*sqrt(-a/b) + 1)*log(f)^3 - 3*x^2*sqrt(-a/b)*dilog(f^x*sqrt(-a/b))*log(
f)^2 + 3*x^2*sqrt(-a/b)*dilog(-f^x*sqrt(-a/b))*log(f)^2 + 6*x*sqrt(-a/b)*lo
g(f)*polylog(3, f^x*sqrt(-a/b)) - 6*x*sqrt(-a/b)*log(f)*polylog(3, -f^x*sqr
t(-a/b)) - 6*sqrt(-a/b)*polylog(4, f^x*sqrt(-a/b)) + 6*sqrt(-a/b)*polylog(4
, -f^x*sqrt(-a/b)))/(a*log(f)^4)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3}{af^x + \frac{b}{f^x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(b/(f^x)+a*f^x),x, algorithm="giac")
```

```
[Out] integrate(x^3/(a*f^x + b/f^x), x)
```

maple [F] time = 0.05, size = 0, normalized size = 0.00

$$\int \frac{x^3}{a\,f^x + b\,f^{-x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(b/(f^x)+a*f^x),x)
```

```
[Out] int(x^3/(b/(f^x)+a*f^x),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3}{af^x + \frac{b}{f^x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(b/(f^x)+a*f^x),x, algorithm="maxima")
```

```
[Out] integrate(x^3/(a*f^x + b/f^x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^3}{\frac{b}{f^x} + a\,f^x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(b/f^x + a*f^x),x)
```

```
[Out] int(x^3/(b/f^x + a*f^x), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^x x^3}{af^{2x} + b}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3/(b/(f**x)+a*f**x),x)
```

```
[Out] Integral(f**x*x**3/(a*f**(2*x) + b), x)
```

3.58 $\int \frac{1}{\left(bf^{-x}+af^{x}\right)^2} \, dx$

Optimal. Leaf size=22

$$-\frac{1}{2a\log(f)\left(af^{2x}+b\right)}$$

```
[Out] -1/2/a/(b+a*f^(2*x))/ln(f)
```

Rubi [A] time = 0.02, antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {2282, 261}

$$-\frac{1}{2a\log(f)\left(af^{2x}+b\right)}$$

Antiderivative was successfully verified.

```
[In] Int[(b/f^x + a*f^x)^(-2),x]
```

```
[Out] -1/(2*a*(b + a*f^(2*x))*Log[f])
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] && !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] && !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\int \frac{1}{\left(bf^{-x}+af^x\right)^2}\,dx = \frac{\text{Subst}\left(\int \frac{x}{\left(b+ax^2\right)^2}\,dx,x,f^x\right)}{\log(f)}$$
$$= -\frac{1}{2a\left(b+af^{2x}\right)\log(f)}$$

Mathematica [**A**] time = 0.02, size = 23, normalized size = 1.05

$$-\frac{1}{2a^2f^{2x}\log(f)+2ab\log(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(b/f^x + a*f^x)^(-2),x]
[Out] -(2*a*b*Log[f] + 2*a^2*f^(2*x)*Log[f])^(-1)
```

fricas [**A**] time = 0.41, size = 21, normalized size = 0.95

$$-\frac{1}{2\left(a^2f^{2x}\log(f)+ab\log(f)\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b/(f^x)+a*f^x)^2,x, algorithm="fricas")
[Out] -1/2/(a^2*f^(2*x)*log(f) + a*b*log(f))
```

giac [**A**] time = 0.34, size = 20, normalized size = 0.91

$$-\frac{1}{2\left(af^{2x}+b\right)a\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b/(f^x)+a*f^x)^2,x, algorithm="giac")
[Out] -1/2/((a*f^(2*x) + b)*a*log(f))
```

maple [**A**] time = 0.00, size = 21, normalized size = 0.95

$$-\frac{1}{2\left(af^{2x}+b\right)a\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b/(f^x)+a*f^x)^2,x)
```

```
[Out] -1/2/ln(f)/a/(a*(f^x)^2+b)
```

maxima [A] time = 0.43, size = 23, normalized size = 1.05

$$\frac{1}{2\left(ab+\frac{b^2}{f^{2x}}\right)\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b/(f^x)+a*f^x)^2,x, algorithm="maxima")
```

```
[Out] 1/2/((a*b + b^2/f^(2*x))*log(f))
```

mupad [B] time = 3.61, size = 20, normalized size = 0.91

$$-\frac{1}{2\,a\,\ln(f)\,\left(b+a\,f^{2\,x}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b/f^x + a*f^x)^2,x)
```

```
[Out] -1/(2*a*log(f)*(b + a*f^(2*x)))
```

sympy [A] time = 0.12, size = 24, normalized size = 1.09

$$-\frac{1}{2a^2f^{2x}\log\left(f\right)+2ab\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b/(f**x)+a*f**x)**2,x)
```

```
[Out] -1/(2*a**2*f**(2*x)*log(f) + 2*a*b*log(f))
```

3.59 $\int \frac{x}{\left(bf^{-x}+af^{x}\right)^2}\,dx$

Optimal. Leaf size=63

$$-\frac{\log\left(af^{2x}+b\right)}{4ab\log^2(f)}-\frac{x}{2a\log(f)\left(af^{2x}+b\right)}+\frac{x}{2ab\log(f)}$$

```
[Out] 1/2*x/a/b/ln(f)-1/2*x/a/(b+a*f^(2*x))/ln(f)-1/4*ln(b+a*f^(2*x))/a/b/ln(f)^2
```

Rubi [A] time = 0.08, antiderivative size = 63, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.353, Rules used = {2283, 2191, 2282, 36, 29, 31}

$$-\frac{\log\left(af^{2x}+b\right)}{4ab\log^2(f)}-\frac{x}{2a\log(f)\left(af^{2x}+b\right)}+\frac{x}{2ab\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[x/(b/f^x + a*f^x)^2,x]
```

```
[Out] x/(2*a*b*Log[f]) - x/(2*a*(b + a*f^(2*x))*Log[f]) - Log[b + a*f^(2*x)]/(4*a
*b*Log[f]^2)
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 2191

```
Int[((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((a_.) + (b_.)*((F_)^((g_.)*(
(e_.) + (f_.)*(x_))))^(n_.))^(p_.)*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :>
 Simp[((c + d*x)^m*(a + b*(F^(g*(e + f*x)))^n)^(p + 1))/(b*f*g*n*(p + 1)*Lo
```

```
g[F]), x] - Dist[(d*m)/(b*f*g*n*(p + 1)*Log[F]), Int[(c + d*x)^(m - 1)*(a +
 b*(F^(g*(e + f*x)))^n)^(p + 1), x], x] /; FreeQ[{F, a, b, c, d, e, f, g, m
, n, p}, x] && NeQ[p, -1]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2283

```
Int[(u_.)*((a_.)*(F_)^(v_) + (b_.)*(F_)^(w_))^(n_), x_Symbol] :> Int[u*F^(n
*v)*(a + b*F^ExpandToSum[w - v, x])^n, x] /; FreeQ[{F, a, b, n}, x] && ILtQ
[n, 0] && LinearQ[{v, w}, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{x}{\left(bf^{-x}+af^{x}\right)^{2}}\,dx &= \int \frac{f^{2x}x}{\left(b+af^{2x}\right)^{2}}\,dx\\
&= -\frac{x}{2a\left(b+af^{2x}\right)\log(f)}+\frac{\int \frac{1}{b+af^{2x}}\,dx}{2a\log(f)}\\
&= -\frac{x}{2a\left(b+af^{2x}\right)\log(f)}+\frac{\mathrm{Subst}\left(\int \frac{1}{x(b+ax)}\,dx,x,f^{2x}\right)}{4a\log^{2}(f)}\\
&= -\frac{x}{2a\left(b+af^{2x}\right)\log(f)}-\frac{\mathrm{Subst}\left(\int \frac{1}{b+ax}\,dx,x,f^{2x}\right)}{4b\log^{2}(f)}+\frac{\mathrm{Subst}\left(\int \frac{1}{x}\,dx,x,f^{2x}\right)}{4ab\log^{2}(f)}\\
&= \frac{x}{2ab\log(f)}-\frac{x}{2a\left(b+af^{2x}\right)\log(f)}-\frac{\log\left(b+af^{2x}\right)}{4ab\log^{2}(f)}
\end{aligned}$$

Mathematica [A] time = 0.06, size = 48, normalized size = 0.76

$$\frac{\frac{2xf^{2x}\log(f)}{af^{2x}+b}-\frac{\log\left(af^{2x}+b\right)}{a}}{4b\log^{2}(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[x/(b/f^x + a*f^x)^2,x]
```

```
[Out] ((2*f^(2*x)*x*Log[f])/(b + a*f^(2*x)) - Log[b + a*f^(2*x)]/a)/(4*b*Log[f]^2
)
```

fricas [A] time = 0.42, size = 61, normalized size = 0.97

$$\frac{2\,af^{2\,x}x\log(f) - \left(af^{2\,x} + b\right)\log\left(af^{2\,x} + b\right)}{4\left(a^2bf^{2\,x}\log(f)^2 + ab^2\log(f)^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(b/(f^x)+a*f^x)^2,x, algorithm="fricas")
```

```
[Out] 1/4*(2*a*f^(2*x)*x*log(f) - (a*f^(2*x) + b)*log(a*f^(2*x) + b))/(a^2*b*f^(2
*x)*log(f)^2 + a*b^2*log(f)^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{\left(af^x + \frac{b}{f^x}\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(b/(f^x)+a*f^x)^2,x, algorithm="giac")
```

```
[Out] integrate(x/(a*f^x + b/f^x)^2, x)
```

maple [A] time = 0.03, size = 56, normalized size = 0.89

$$\frac{x\,\mathrm{e}^{2x\ln(f)}}{2\left(a\,\mathrm{e}^{2x\ln(f)} + b\right)b\ln(f)} - \frac{\ln\left(a\,\mathrm{e}^{2x\ln(f)} + b\right)}{4ab\ln(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(b/(f^x)+a*f^x)^2,x)
```

```
[Out] 1/2/b/ln(f)*x*exp(x*ln(f))^2/(exp(x*ln(f))^2*a+b)-1/4/ln(f)^2/a/b*ln(exp(x*
ln(f))^2*a+b)
```

maxima [A] time = 0.50, size = 54, normalized size = 0.86

$$\frac{f^{2\,x}x}{2\left(abf^{2\,x}\log(f) + b^2\log(f)\right)} - \frac{\log\left(\frac{af^{2\,x}+b}{a}\right)}{4\,ab\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(b/(f^x)+a*f^x)^2,x, algorithm="maxima")
```

```
[Out] 1/2*f^(2*x)*x/(a*b*f^(2*x)*log(f) + b^2*log(f)) - 1/4*log((a*f^(2*x) + b)/a
)/(a*b*log(f)^2)
```

mupad [B] time = 3.61, size = 51, normalized size = 0.81

$$\frac{f^{2x}\,x}{2\,\left(b^2\,\ln(f)+a\,b\,f^{2x}\,\ln(f)\right)}-\frac{\ln\left(b+a\,f^{2x}\right)}{4\,a\,b\ln(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(b/f^x + a*f^x)^2,x)
```

```
[Out] (f^(2*x)*x)/(2*(b^2*log(f) + a*b*f^(2*x)*log(f))) - log(b + a*f^(2*x))/(4*a
*b*log(f)^2)
```

sympy [A] time = 0.19, size = 53, normalized size = 0.84

$$-\frac{x}{2a^2f^{2x}\log{(f)}+2ab\log{(f)}}+\frac{x}{2ab\log{(f)}}-\frac{\log{\left(f^{2x}+\frac{b}{a}\right)}}{4ab\log{(f)}^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(b/(f**x)+a*f**x)**2,x)
```

```
[Out] -x/(2*a**2*f**(2*x)*log(f) + 2*a*b*log(f)) + x/(2*a*b*log(f)) - log(f**(2*x
) + b/a)/(4*a*b*log(f)**2)
```

3.60 $\int \frac{x^2}{\left(bf^{-x}+af^x\right)^2}\,dx$

Optimal. Leaf size=98

$$-\frac{\text{Li}_2\left(-\frac{af^{2x}}{b}\right)}{4ab\log^3(f)}-\frac{x^2}{2a\log(f)\left(af^{2x}+b\right)}-\frac{x\log\left(\frac{af^{2x}}{b}+1\right)}{2ab\log^2(f)}+\frac{x^2}{2ab\log(f)}$$

```
[Out] 1/2*x^2/a/b/ln(f)-1/2*x^2/a/(b+a*f^(2*x))/ln(f)-1/2*x*ln(1+a*f^(2*x)/b)/a/b
/ln(f)^2-1/4*polylog(2,-a*f^(2*x)/b)/a/b/ln(f)^3
```

Rubi [A] time = 0.17, antiderivative size = 98, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.316, Rules used = {2283, 2191, 2184, 2190, 2279, 2391}

$$-\frac{\text{PolyLog}\left(2,-\frac{af^{2x}}{b}\right)}{4ab\log^3(f)}-\frac{x^2}{2a\log(f)\left(af^{2x}+b\right)}-\frac{x\log\left(\frac{af^{2x}}{b}+1\right)}{2ab\log^2(f)}+\frac{x^2}{2ab\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/(b/f^x + a*f^x)^2,x]
```

```
[Out] x^2/(2*a*b*Log[f]) - x^2/(2*a*(b + a*f^(2*x))*Log[f]) - (x*Log[1 + (a*f^(2*
x))/b])/(2*a*b*Log[f]^2) - PolyLog[2, -((a*f^(2*x))/b)]/(4*a*b*Log[f]^3)
```

Rule 2184

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[((c + d*x)^m*(F^(g*(e + f*x)))^n)/(a + b*(F^(g*(e + f*x)))^n), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2191

```
Int[((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((a_.) + (b_.)*((F_)^((g_.)*(
(e_.) + (f_.)*(x_))))^(n_.))^(p_.)*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :>
```

```
 Simp[((c + d*x)^m*(a + b*(F^(g*(e + f*x)))^n)^(p + 1))/(b*f*g*n*(p + 1)*Lo
g[F]), x] - Dist[(d*m)/(b*f*g*n*(p + 1)*Log[F]), Int[(c + d*x)^(m - 1)*(a +
 b*(F^(g*(e + f*x)))^n)^(p + 1), x], x] /; FreeQ[{F, a, b, c, d, e, f, g, m
, n, p}, x] && NeQ[p, -1]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2283

```
Int[(u_.)*((a_.)*(F_)^(v_) + (b_.)*(F_)^(w_))^(n_), x_Symbol] :> Int[u*F^(n
*v)*(a + b*F^ExpandToSum[w - v, x])^n, x] /; FreeQ[{F, a, b, n}, x] && ILtQ
[n, 0] && LinearQ[{v, w}, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^2}{\left(bf^{-x}+af^x\right)^2}\,dx=\int \frac{f^{2x}x^2}{\left(b+af^{2x}\right)^2}\,dx$$

$$=-\frac{x^2}{2a\left(b+af^{2x}\right)\log(f)}+\frac{\int \frac{x}{b+af^{2x}}\,dx}{a\log(f)}$$

$$=\frac{x^2}{2ab\log(f)}-\frac{x^2}{2a\left(b+af^{2x}\right)\log(f)}-\frac{\int \frac{f^{2x}x}{b+af^{2x}}\,dx}{b\log(f)}$$

$$=\frac{x^2}{2ab\log(f)}-\frac{x^2}{2a\left(b+af^{2x}\right)\log(f)}-\frac{x\log\left(1+\frac{af^{2x}}{b}\right)}{2ab\log^2(f)}+\frac{\int \log\left(1+\frac{af^{2x}}{b}\right)dx}{2ab\log^2(f)}$$

$$=\frac{x^2}{2ab\log(f)}-\frac{x^2}{2a\left(b+af^{2x}\right)\log(f)}-\frac{x\log\left(1+\frac{af^{2x}}{b}\right)}{2ab\log^2(f)}+\frac{\text{Subst}\left(\int \frac{\log\left(1+\frac{ax}{b}\right)}{x}\,dx,x,f^{2x}\right)}{4ab\log^3(f)}$$

$$=\frac{x^2}{2ab\log(f)}-\frac{x^2}{2a\left(b+af^{2x}\right)\log(f)}-\frac{x\log\left(1+\frac{af^{2x}}{b}\right)}{2ab\log^2(f)}-\frac{\text{Li}_2\left(-\frac{af^{2x}}{b}\right)}{4ab\log^3(f)}$$

Mathematica [A] time = 0.07, size = 90, normalized size = 0.92

$$\frac{2x\log(f)\left(axf^{2x}\log(f)-\left(af^{2x}+b\right)\log\left(\frac{af^{2x}}{b}+1\right)\right)-\left(af^{2x}+b\right)\text{Li}_2\left(-\frac{af^{2x}}{b}\right)}{4ab\log^3(f)\left(af^{2x}+b\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/(b/f^x + a*f^x)^2,x]
```

```
[Out] (2*x*Log[f]*(a*f^(2*x)*x*Log[f] - (b + a*f^(2*x))*Log[1 + (a*f^(2*x))/b]) -
 (b + a*f^(2*x))*PolyLog[2, -((a*f^(2*x))/b)])/(4*a*b*(b + a*f^(2*x))*Log[f
]^3)
```

fricas [A] time = 0.42, size = 159, normalized size = 1.62

$$\frac{af^{2x}x^2\log(f)^2-\left(af^{2x}+b\right)\text{Li}_2\left(f^x\sqrt{-\frac{a}{b}}\right)-\left(af^{2x}+b\right)\text{Li}_2\left(-f^x\sqrt{-\frac{a}{b}}\right)-\left(af^{2x}x\log(f)+bx\log(f)\right)\log\left(f^x\sqrt{-\right.}{2\left(a^2bf^{2x}\log(f)^3+ab^2\log(f)^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(b/(f^x)+a*f^x)^2,x, algorithm="fricas")
```

```
[Out] 1/2*(a*f^(2*x)*x^2*log(f)^2 - (a*f^(2*x) + b)*dilog(f^x*sqrt(-a/b)) - (a*f^
(2*x) + b)*dilog(-f^x*sqrt(-a/b)) - (a*f^(2*x)*x*log(f) + b*x*log(f))*log(f
^x*sqrt(-a/b) + 1) - (a*f^(2*x)*x*log(f) + b*x*log(f))*log(-f^x*sqrt(-a/b)
+ 1))/(a^2*b*f^(2*x)*log(f)^3 + a*b^2*log(f)^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\left(af^x + \frac{b}{f^x}\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(b/(f^x)+a*f^x)^2,x, algorithm="giac")
```

```
[Out] integrate(x^2/(a*f^x + b/f^x)^2, x)
```

maple [A] time = 0.05, size = 91, normalized size = 0.93

$$-\frac{x^2}{2\left(a\,f^{2x}+b\right)a\ln(f)}+\frac{x^2}{2ab\ln(f)}-\frac{x\ln\left(\frac{a\,f^{2x}}{b}+1\right)}{2ab\ln(f)^2}-\frac{\mathrm{polylog}\left(2,-\frac{a\,f^{2x}}{b}\right)}{4ab\ln(f)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(b/(f^x)+a*f^x)^2,x)
```

```
[Out] -1/2/ln(f)/a*x^2/(a*(f^x)^2+b)+1/2*x^2/a/b/ln(f)-1/2*x*ln(1+a*f^(2*x)/b)/a/
b/ln(f)^2-1/4*polylog(2,-a*f^(2*x)/b)/a/b/ln(f)^3
```

maxima [A] time = 0.48, size = 83, normalized size = 0.85

$$-\frac{x^2}{2\left(a^2f^{2x}\log(f)+ab\log(f)\right)}+\frac{x^2}{2\,ab\log(f)}-\frac{2\,x\log\left(\frac{af^{2x}}{b}+1\right)\log(f)+\mathrm{Li}_2\left(-\frac{af^{2x}}{b}\right)}{4\,ab\log(f)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(b/(f^x)+a*f^x)^2,x, algorithm="maxima")
```

```
[Out] -1/2*x^2/(a^2*f^(2*x)*log(f) + a*b*log(f)) + 1/2*x^2/(a*b*log(f)) - 1/4*(2*
x*log(a*f^(2*x)/b + 1)*log(f) + dilog(-a*f^(2*x)/b))/(a*b*log(f)^3)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2}{\left(\frac{b}{f^x} + a\,f^x\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(b/f^x + a*f^x)^2,x)
```

```
[Out] int(x^2/(b/f^x + a*f^x)^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{x^2}{2a^2f^{2x}\log(f) + 2ab\log(f)} + \frac{\int \frac{x}{af^{2x}+b}\,dx}{a\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(b/(f**x)+a*f**x)**2,x)
```

```
[Out] -x**2/(2*a**2*f**(2*x)*log(f) + 2*a*b*log(f)) + Integral(x/(a*f**(2*x) + b)
, x)/(a*log(f))
```

3.61 $\int \frac{x^3}{\left(bf^{-x}+af^x\right)^2}\,dx$

Optimal. Leaf size=128

$$\frac{3\text{Li}_3\left(-\frac{af^{2x}}{b}\right)}{8ab\log^4(f)}-\frac{3x\text{Li}_2\left(-\frac{af^{2x}}{b}\right)}{4ab\log^3(f)}-\frac{x^3}{2a\log(f)\left(af^{2x}+b\right)}-\frac{3x^2\log\left(\frac{af^{2x}}{b}+1\right)}{4ab\log^2(f)}+\frac{x^3}{2ab\log(f)}$$

```
[Out] 1/2*x^3/a/b/ln(f)-1/2*x^3/a/(b+a*f^(2*x))/ln(f)-3/4*x^2*ln(1+a*f^(2*x)/b)/a
/b/ln(f)^2-3/4*x*polylog(2,-a*f^(2*x)/b)/a/b/ln(f)^3+3/8*polylog(3,-a*f^(2*
x)/b)/a/b/ln(f)^4
```

Rubi [A] time = 0.23, antiderivative size = 128, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.368, Rules used = {2283, 2191, 2184, 2190, 2531, 2282, 6589}

$$-\frac{3x\text{PolyLog}\left(2,-\frac{af^{2x}}{b}\right)}{4ab\log^3(f)}+\frac{3\text{PolyLog}\left(3,-\frac{af^{2x}}{b}\right)}{8ab\log^4(f)}-\frac{3x^2\log\left(\frac{af^{2x}}{b}+1\right)}{4ab\log^2(f)}-\frac{x^3}{2a\log(f)\left(af^{2x}+b\right)}+\frac{x^3}{2ab\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[x^3/(b/f^x + a*f^x)^2,x]
```

```
[Out] x^3/(2*a*b*Log[f]) - x^3/(2*a*(b + a*f^(2*x))*Log[f]) - (3*x^2*Log[1 + (a*f
^(2*x))/b])/(4*a*b*Log[f]^2) - (3*x*PolyLog[2, -((a*f^(2*x))/b)])/(4*a*b*Lo
g[f]^3) + (3*PolyLog[3, -((a*f^(2*x))/b)])/(8*a*b*Log[f]^4)
```

Rule 2184

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[((c + d*x)^m*(F^(g*(e + f*x)))^n)/(a + b*(F^(g*(e + f*x)))^n), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2191

```
Int[((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((a_.) + (b_.)*((F_)^((g_.)*(
(e_.) + (f_.)*(x_))))^(n_.))^(p_.)*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :>
 Simp[((c + d*x)^m*(a + b*(F^(g*(e + f*x)))^n)^(p + 1))/(b*f*g*n*(p + 1)*Lo
g[F]), x] - Dist[(d*m)/(b*f*g*n*(p + 1)*Log[F]), Int[(c + d*x)^(m - 1)*(a +
 b*(F^(g*(e + f*x)))^n)^(p + 1), x], x] /; FreeQ[{F, a, b, c, d, e, f, g, m
, n, p}, x] && NeQ[p, -1]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2283

```
Int[(u_.)*((a_.)*(F_)^(v_) + (b_.)*(F_)^(w_))^(n_), x_Symbol] :> Int[u*F^(n
*v)*(a + b*F^ExpandToSum[w - v, x])^n, x] /; FreeQ[{F, a, b, n}, x] && ILtQ
[n, 0] && LinearQ[{v, w}, x]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x^3}{\left(bf^{-x}+af^x\right)^2}\,dx = \int \frac{f^{2x}x^3}{\left(b+af^{2x}\right)^2}\,dx$$

$$= -\frac{x^3}{2a\left(b+af^{2x}\right)\log(f)} + \frac{3\int \frac{x^2}{b+af^{2x}}\,dx}{2a\log(f)}$$

$$= \frac{x^3}{2ab\log(f)} - \frac{x^3}{2a\left(b+af^{2x}\right)\log(f)} - \frac{3\int \frac{f^{2x}x^2}{b+af^{2x}}\,dx}{2b\log(f)}$$

$$= \frac{x^3}{2ab\log(f)} - \frac{x^3}{2a\left(b+af^{2x}\right)\log(f)} - \frac{3x^2\log\left(1+\frac{af^{2x}}{b}\right)}{4ab\log^2(f)} + \frac{3\int x\log\left(1+\frac{af^{2x}}{b}\right)dx}{2ab\log^2(f)}$$

$$= \frac{x^3}{2ab\log(f)} - \frac{x^3}{2a\left(b+af^{2x}\right)\log(f)} - \frac{3x^2\log\left(1+\frac{af^{2x}}{b}\right)}{4ab\log^2(f)} - \frac{3x\mathrm{Li}_2\left(-\frac{af^{2x}}{b}\right)}{4ab\log^3(f)} + \frac{3\int \mathrm{Li}_2\left(-\frac{af^{2x}}{b} \cdots\right.}{4ab\log^3(\cdots}$$

$$= \frac{x^3}{2ab\log(f)} - \frac{x^3}{2a\left(b+af^{2x}\right)\log(f)} - \frac{3x^2\log\left(1+\frac{af^{2x}}{b}\right)}{4ab\log^2(f)} - \frac{3x\mathrm{Li}_2\left(-\frac{af^{2x}}{b}\right)}{4ab\log^3(f)} + \frac{3\,\mathrm{Subst}\left(\int \cdots\right.}{8ab \cdots}$$

$$= \frac{x^3}{2ab\log(f)} - \frac{x^3}{2a\left(b+af^{2x}\right)\log(f)} - \frac{3x^2\log\left(1+\frac{af^{2x}}{b}\right)}{4ab\log^2(f)} - \frac{3x\mathrm{Li}_2\left(-\frac{af^{2x}}{b}\right)}{4ab\log^3(f)} + \frac{3\mathrm{Li}_3\left(-\frac{af^{2x}}{b}\right)}{8ab\log^4(f)}$$

Mathematica [A]   time = 0.09, size = 124, normalized size = 0.97

$$\frac{3\left(\frac{\mathrm{Li}_3\left(-\frac{af^{2x}}{b}\right)}{4b\log^3(f)} - \frac{x\mathrm{Li}_2\left(-\frac{af^{2x}}{b}\right)}{2b\log^2(f)} - \frac{x^2\log\left(\frac{af^{2x}}{b}+1\right)}{2b\log(f)} + \frac{x^3}{3b}\right)}{2a\log(f)} - \frac{x^3}{2a\log(f)\left(af^{2x}+b\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3/(b/f^x + a*f^x)^2,x]
```

```
[Out] -1/2*x^3/(a*(b + a*f^(2*x))*Log[f]) + (3*(x^3/(3*b) - (x^2*Log[1 + (a*f^(2*
x))/b])/(2*b*Log[f]) - (x*PolyLog[2, -((a*f^(2*x))/b)])/(2*b*Log[f]^2) + Po
lyLog[3, -((a*f^(2*x))/b)]/(4*b*Log[f]^3)))/(2*a*Log[f])
```

fricas [C] time = 0.43, size = 241, normalized size = 1.88

$$\frac{2\,af^{2\,x}x^{3}\log(f)^{3}-6\left(af^{2\,x}x\log(f)+bx\log(f)\right)\mathrm{Li}_2\left(f^{x}\sqrt{-\frac{a}{b}}\right)-6\left(af^{2\,x}x\log(f)+bx\log(f)\right)\mathrm{Li}_2\left(-f^{x}\sqrt{-\frac{a}{b}}\right)-3}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(b/(f^x)+a*f^x)^2,x, algorithm="fricas")
```

```
[Out] 1/4*(2*a*f^(2*x)*x^3*log(f)^3 - 6*(a*f^(2*x)*x*log(f) + b*x*log(f))*dilog(f
^x*sqrt(-a/b)) - 6*(a*f^(2*x)*x*log(f) + b*x*log(f))*dilog(-f^x*sqrt(-a/b))
 - 3*(a*f^(2*x)*x^2*log(f)^2 + b*x^2*log(f)^2)*log(f^x*sqrt(-a/b) + 1) - 3*
(a*f^(2*x)*x^2*log(f)^2 + b*x^2*log(f)^2)*log(-f^x*sqrt(-a/b) + 1) + 6*(a*f
^(2*x) + b)*polylog(3, f^x*sqrt(-a/b)) + 6*(a*f^(2*x) + b)*polylog(3, -f^x*
sqrt(-a/b)))/(a^2*b*f^(2*x)*log(f)^4 + a*b^2*log(f)^4)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{3}}{\left(af^{x}+\frac{b}{f^{x}}\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(b/(f^x)+a*f^x)^2,x, algorithm="giac")
```

```
[Out] integrate(x^3/(a*f^x + b/f^x)^2, x)
```

maple [A] time = 0.05, size = 119, normalized size = 0.93

$$-\frac{x^{3}}{2\left(a\,f^{2x}+b\right)a\ln(f)}+\frac{x^{3}}{2ab\ln(f)}-\frac{3x^{2}\ln\left(\frac{a\,f^{2x}}{b}+1\right)}{4ab\ln(f)^{2}}-\frac{3x\,\mathrm{polylog}\left(2,-\frac{a\,f^{2x}}{b}\right)}{4ab\ln(f)^{3}}+\frac{3\,\mathrm{polylog}\left(3,-\frac{a\,f^{2x}}{b}\right)}{8ab\ln(f)^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(b/(f^x)+a*f^x)^2,x)
```

```
[Out] -1/2/ln(f)*x^3/a/(a*(f^x)^2+b)+1/2*x^3/a/b/ln(f)-3/4*x^2*ln(a/b*f^(2*x)+1)/
a/b/ln(f)^2-3/4*x*polylog(2,-a/b*f^(2*x))/a/b/ln(f)^3+3/8*polylog(3,-a/b*f^
(2*x))/a/b/ln(f)^4
```

maxima [A] time = 0.50, size = 107, normalized size = 0.84

$$-\frac{x^{3}}{2\left(a^{2}f^{2\,x}\log(f)+ab\log(f)\right)}+\frac{x^{3}}{2\,ab\log(f)}-\frac{3\left(2\,x^{2}\log\left(\frac{af^{2\,x}}{b}+1\right)\log(f)^{2}+2\,x\mathrm{Li}_2\left(-\frac{af^{2\,x}}{b}\right)\log(f)-\mathrm{Li}_3(-\frac{af^{2\,x}}{b})\right.}{8\,ab\log(f)^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(b/(f^x)+a*f^x)^2,x, algorithm="maxima")
```

```
[Out] -1/2*x^3/(a^2*f^(2*x)*log(f) + a*b*log(f)) + 1/2*x^3/(a*b*log(f)) - 3/8*(2*
x^2*log(a*f^(2*x)/b + 1)*log(f)^2 + 2*x*dilog(-a*f^(2*x)/b)*log(f) - polylo
g(3, -a*f^(2*x)/b))/(a*b*log(f)^4)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3}{\left(\frac{b}{f^x}+a\,f^x\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(b/f^x + a*f^x)^2,x)
```

```
[Out] int(x^3/(b/f^x + a*f^x)^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{x^3}{2a^2f^{2x}\log(f)+2ab\log(f)}+\frac{3\int\frac{x^2}{af^{2x}+b}\,dx}{2a\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3/(b/(f**x)+a*f**x)**2,x)
```

```
[Out] -x**3/(2*a**2*f**(2*x)*log(f) + 2*a*b*log(f)) + 3*Integral(x**2/(a*f**(2*x)
 + b), x)/(2*a*log(f))
```

3.62 $\int \frac{1}{\left(bf^{-x}+af^x\right)^3} dx$

Optimal. Leaf size=87

$$\frac{\tan^{-1}\left(\frac{\sqrt{a}f^x}{\sqrt{b}}\right)}{8a^{3/2}b^{3/2}\log(f)}+\frac{f^x}{8ab\log(f)\left(af^{2x}+b\right)}-\frac{f^x}{4a\log(f)\left(af^{2x}+b\right)^2}$$

```
[Out] -1/4*f^x/a/(b+a*f^(2*x))^2/ln(f)+1/8*f^x/a/b/(b+a*f^(2*x))/ln(f)+1/8*arctan
(f^x*a^(1/2)/b^(1/2))/a^(3/2)/b^(3/2)/ln(f)
```

Rubi [A] time = 0.05, antiderivative size = 87, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267, Rules used = {2282, 288, 199, 205}

$$\frac{\tan^{-1}\left(\frac{\sqrt{a}f^x}{\sqrt{b}}\right)}{8a^{3/2}b^{3/2}\log(f)}+\frac{f^x}{8ab\log(f)\left(af^{2x}+b\right)}-\frac{f^x}{4a\log(f)\left(af^{2x}+b\right)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(b/f^x + a*f^x)^(-3),x]
```

```
[Out] -f^x/(4*a*(b + a*f^(2*x))^2*Log[f]) + f^x/(8*a*b*(b + a*f^(2*x))*Log[f]) +
ArcTan[(Sqrt[a]*f^x)/Sqrt[b]]/(8*a^(3/2)*b^(3/2)*Log[f])
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 288

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^
(n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*n*(p + 1)), x] - Dist[(c^
n*(m - n + 1))/(b*n*(p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^(p + 1), x], x]
```

```
/; FreeQ[{a, b, c}, x] && IGtQ[n, 0] && LtQ[p, -1] && GtQ[m + 1, n] && !I
LtQ[(m + n*(p + 1) + 1)/n, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] && !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] && !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\int \frac{1}{\left(bf^{-x}+af^x\right)^3}\,dx = \frac{\text{Subst}\left(\int \frac{x^2}{\left(b+ax^2\right)^3}\,dx,x,f^x\right)}{\log(f)}$$

$$= -\frac{f^x}{4a\left(b+af^{2x}\right)^2\log(f)}+\frac{\text{Subst}\left(\int \frac{1}{\left(b+ax^2\right)^2}\,dx,x,f^x\right)}{4a\log(f)}$$

$$= -\frac{f^x}{4a\left(b+af^{2x}\right)^2\log(f)}+\frac{f^x}{8ab\left(b+af^{2x}\right)\log(f)}+\frac{\text{Subst}\left(\int \frac{1}{b+ax^2}\,dx,x,f^x\right)}{8ab\log(f)}$$

$$= -\frac{f^x}{4a\left(b+af^{2x}\right)^2\log(f)}+\frac{f^x}{8ab\left(b+af^{2x}\right)\log(f)}+\frac{\tan^{-1}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)}{8a^{3/2}b^{3/2}\log(f)}$$

Mathematica [A] time = 0.05, size = 70, normalized size = 0.80

$$\frac{\tan^{-1}\left(\frac{\sqrt{a}\,f^x}{\sqrt{b}}\right)+\frac{\sqrt{a}\,\sqrt{b}\,f^x\left(af^{2x}-b\right)}{\left(af^{2x}+b\right)^2}}{8a^{3/2}b^{3/2}\log(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(b/f^x + a*f^x)^(-3),x]
```

```
[Out] ((Sqrt[a]*Sqrt[b]*f^x*(-b + a*f^(2*x)))/(b + a*f^(2*x))^2 + ArcTan[(Sqrt[a]
*f^x)/Sqrt[b]])/(8*a^(3/2)*b^(3/2)*Log[f])
```

fricas [A] time = 0.44, size = 261, normalized size = 3.00

$$\left[\frac{2\,a^{2}bf^{3\,x}-2\,ab^{2}f^{x}-\left(\sqrt{-ab}\,a^{2}f^{4\,x}+2\,\sqrt{-ab}\,abf^{2\,x}+\sqrt{-ab}\,b^{2}\right)\log\left(\frac{af^{2\,x}-2\,\sqrt{-ab}\,f^{x}-b}{af^{2\,x}+b}\right)}{16\left(a^{4}b^{2}f^{4\,x}\log(f)+2\,a^{3}b^{3}f^{2\,x}\log(f)+a^{2}b^{4}\log(f)\right)},\frac{a^{2}bf^{3\,x}-ab^{2}f^{x}-\left(\sqrt{ab}\,a^{2}\right.}{8\left(a^{4}b^{2}f^{4\,x}\log(f\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b/(f^x)+a*f^x)^3,x, algorithm="fricas")
```

```
[Out] [1/16*(2*a^2*b*f^(3*x) - 2*a*b^2*f^x - (sqrt(-a*b)*a^2*f^(4*x) + 2*sqrt(-a*
b)*a*b*f^(2*x) + sqrt(-a*b)*b^2)*log((a*f^(2*x) - 2*sqrt(-a*b)*f^x - b)/(a*
f^(2*x) + b)))/(a^4*b^2*f^(4*x)*log(f) + 2*a^3*b^3*f^(2*x)*log(f) + a^2*b^4
*log(f)), 1/8*(a^2*b*f^(3*x) - a*b^2*f^x - (sqrt(a*b)*a^2*f^(4*x) + 2*sqrt(
a*b)*a*b*f^(2*x) + sqrt(a*b)*b^2)*arctan(sqrt(a*b)/(a*f^x)))/(a^4*b^2*f^(4*
x)*log(f) + 2*a^3*b^3*f^(2*x)*log(f) + a^2*b^4*log(f))]
```

giac [A] time = 0.31, size = 66, normalized size = 0.76

$$\frac{\arctan\left(\frac{af^{x}}{\sqrt{ab}}\right)}{8\,\sqrt{ab}\,ab\log(f)}+\frac{af^{3\,x}-bf^{x}}{8\left(af^{2\,x}+b\right)^{2}ab\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b/(f^x)+a*f^x)^3,x, algorithm="giac")
```

```
[Out] 1/8*arctan(a*f^x/sqrt(a*b))/(sqrt(a*b)*a*b*log(f)) + 1/8*(a*f^(3*x) - b*f^x
)/((a*f^(2*x) + b)^2*a*b*log(f))
```

maple [A] time = 0.01, size = 78, normalized size = 0.90

$$-\frac{f^{x}}{8\left(a\,f^{2x}+b\right)^{2}a\ln(f)}+\frac{f^{3x}}{8\left(a\,f^{2x}+b\right)^{2}b\ln(f)}+\frac{\arctan\left(\frac{a\,f^{x}}{\sqrt{ab}}\right)}{8\sqrt{ab}\;ab\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b/(f^x)+a*f^x)^3,x)
```

```
[Out] 1/8/ln(f)/(a*(f^x)^2+b)^2/b*(f^x)^3-1/8/ln(f)/(a*(f^x)^2+b)^2*f^x/a+1/8/ln(
f)/b/a/(a*b)^(1/2)*arctan(1/(a*b)^(1/2)*a*f^x)
```

maxima [A] time = 0.97, size = 90, normalized size = 1.03

$$-\frac{\frac{b}{f^{3\,x}}-\frac{a}{f^{x}}}{8\left(a^{3}b+\frac{ab^{3}}{f^{4\,x}}+\frac{2\,a^{2}b^{2}}{f^{2\,x}}\right)\log(f)}-\frac{\arctan\left(\frac{b}{\sqrt{ab}\,f^{x}}\right)}{8\,\sqrt{ab}\,ab\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b/(f^x)+a*f^x)^3,x, algorithm="maxima")
```

```
[Out] -1/8*(b/f^(3*x) - a/f^x)/((a^3*b + a*b^3/f^(4*x) + 2*a^2*b^2/f^(2*x))*log(f
)) - 1/8*arctan(b/(sqrt(a*b)*f^x))/(sqrt(a*b)*a*b*log(f))
```

mupad [B] time = 3.64, size = 113, normalized size = 1.30

$$\frac{f^x}{8\,\left(a\,b^2\,\ln(f)+a^2\,b\,f^{2\,x}\,\ln(f)\right)}-\frac{f^x}{4\,\left(a\,b^2\,\ln(f)+a^3\,f^{4\,x}\,\ln(f)+2\,a^2\,b\,f^{2\,x}\,\ln(f)\right)}+\frac{\mathrm{atan}\left(\frac{f^x\,\sqrt{a^3\,b^3\,{\ln(f)}^2}}{a\,b^2\,\ln(f)}\right)}{8\,\sqrt{a^3\,b^3\,{\ln(f)}^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b/f^x + a*f^x)^3,x)
```

```
[Out] f^x/(8*(a*b^2*log(f) + a^2*b*f^(2*x)*log(f))) - f^x/(4*(a*b^2*log(f) + a^3*
f^(4*x)*log(f) + 2*a^2*b*f^(2*x)*log(f))) + atan((f^x*(a^3*b^3*log(f)^2)^(1
/2))/(a*b^2*log(f)))/(8*(a^3*b^3*log(f)^2)^(1/2))
```

sympy [A] time = 0.28, size = 85, normalized size = 0.98

$$\frac{af^{3x}-bf^x}{8a^3bf^{4x}\log(f)+16a^2b^2f^{2x}\log(f)+8ab^3\log(f)}+\frac{\operatorname{RootSum}\left(256z^2a^3b^3+1,\left(i\mapsto i\log\left(16iab^2+f^x\right)\right)\right)}{\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b/(f**x)+a*f**x)**3,x)
```

```
[Out] (a*f**(3*x) - b*f**x)/(8*a**3*b*f**(4*x)*log(f) + 16*a**2*b**2*f**(2*x)*log
(f) + 8*a*b**3*log(f)) + RootSum(256*_z**2*a**3*b**3 + 1, Lambda(_i, _i*log
(16*_i*a*b**2 + f**x)))/log(f)
```

3.63 $\int \frac{x}{\left(bf^{-x}+af^x\right)^3}\,dx$

Optimal. Leaf size=196

$$-\frac{i\text{Li}_2\left(-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{16a^{3/2}b^{3/2}\log^2(f)}+\frac{i\text{Li}_2\left(\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{16a^{3/2}b^{3/2}\log^2(f)}+\frac{x\tan^{-1}\left(\frac{\sqrt{a}f^x}{\sqrt{b}}\right)}{8a^{3/2}b^{3/2}\log(f)}+\frac{f^x}{8ab\log^2(f)\left(af^{2x}+b\right)}+\frac{xf^x}{8ab\log(f)\left(af^{2x}+b\right)}-\frac{}{4a\log}$$

```
[Out] 1/8*f^x/a/b/(b+a*f^(2*x))/ln(f)^2-1/4*f^x*x/a/(b+a*f^(2*x))^2/ln(f)+1/8*f^x
*x/a/b/(b+a*f^(2*x))/ln(f)+1/8*x*arctan(f^x*a^(1/2)/b^(1/2))/a^(3/2)/b^(3/2
)/ln(f)-1/16*I*polylog(2,-I*f^x*a^(1/2)/b^(1/2))/a^(3/2)/b^(3/2)/ln(f)^2+1/
16*I*polylog(2,I*f^x*a^(1/2)/b^(1/2))/a^(3/2)/b^(3/2)/ln(f)^2
```

Rubi [A] time = 0.50, antiderivative size = 196, normalized size of antiderivative = 1.00, number of steps used = 22, number of rules used = 9, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.529, Rules used = {2283, 2254, 2249, 199, 205, 2245, 2282, 4848, 2391}

$$-\frac{i\text{PolyLog}\left(2,-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{16a^{3/2}b^{3/2}\log^2(f)}+\frac{i\text{PolyLog}\left(2,\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{16a^{3/2}b^{3/2}\log^2(f)}+\frac{x\tan^{-1}\left(\frac{\sqrt{a}f^x}{\sqrt{b}}\right)}{8a^{3/2}b^{3/2}\log(f)}+\frac{f^x}{8ab\log^2(f)\left(af^{2x}+b\right)}+\frac{xf^x}{8ab\log(f)\left(af^{2x}+b\right)}-$$

Antiderivative was successfully verified.

```
[In] Int[x/(b/f^x + a*f^x)^3,x]
```

```
[Out] f^x/(8*a*b*(b + a*f^(2*x))*Log[f]^2) - (f^x*x)/(4*a*(b + a*f^(2*x))^2*Log[f
]) + (f^x*x)/(8*a*b*(b + a*f^(2*x))*Log[f]) + (x*ArcTan[(Sqrt[a]*f^x)/Sqrt[
b]])/(8*a^(3/2)*b^(3/2)*Log[f]) - ((I/16)*PolyLog[2, ((-I)*Sqrt[a]*f^x)/Sqr
t[b]])/(a^(3/2)*b^(3/2)*Log[f]^2) + ((I/16)*PolyLog[2, (I*Sqrt[a]*f^x)/Sqrt
[b]])/(a^(3/2)*b^(3/2)*Log[f]^2)
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2245

```
Int[(F_)^((e_.)*((c_.) + (d_.)*(x_)))*((a_.) + (b_.)*(F_)^(v_))^(p_)*(x_)^(
m_.), x_Symbol] :> With[{u = IntHide[F^(e*(c + d*x))*(a + b*F^v)^p, x]}, Di
st[x^m, u, x] - Dist[m, Int[x^(m - 1)*u, x], x]] /; FreeQ[{F, a, b, c, d, e
}, x] && EqQ[v, 2*e*(c + d*x)] && GtQ[m, 0] && ILtQ[p, 0]
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rule 2254

```
Int[((a_.) + (b_.)*(F_)^(u_))^(p_.)*((c_.) + (d_.)*(F_)^(v_))^(q_.)*((e_.)
+ (f_.)*(x_))^(m_.), x_Symbol] :> With[{w = ExpandIntegrand[(e + f*x)^m, (a
 + b*F^u)^p*(c + d*F^v)^q, x]}, Int[w, x] /; SumQ[w]] /; FreeQ[{F, a, b, c,
 d, e, f, m}, x] && IntegersQ[p, q] && LinearQ[{u, v}, x] && RationalQ[Simp
lify[u/v]]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2283

```
Int[(u_.)*((a_.)*(F_)^(v_) + (b_.)*(F_)^(w_))^(n_), x_Symbol] :> Int[u*F^(n
*v)*(a + b*F^ExpandToSum[w - v, x])^n, x] /; FreeQ[{F, a, b, n}, x] && ILtQ
[n, 0] && LinearQ[{v, w}, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rubi steps

$$\int \frac{x}{\left(bf^{-x}+af^{x}\right)^3}\,dx = \int \frac{f^{3x}x}{\left(b+af^{2x}\right)^3}\,dx$$

$$= \int \left(-\frac{bf^{x}x}{a\left(b+af^{2x}\right)^3}+\frac{f^{x}x}{a\left(b+af^{2x}\right)^2}\right)dx$$

$$= \frac{\int \frac{f^{x}x}{\left(b+af^{2x}\right)^2}\,dx}{a}-\frac{b\int \frac{f^{x}x}{\left(b+af^{2x}\right)^3}\,dx}{a}$$

$$= -\frac{f^{x}x}{4a\left(b+af^{2x}\right)^2\log(f)}+\frac{f^{x}x}{8ab\left(b+af^{2x}\right)\log(f)}+\frac{x\tan^{-1}\left(\frac{\sqrt{a}f^{x}}{\sqrt{b}}\right)}{8a^{3/2}b^{3/2}\log(f)}-\frac{\int\left(\frac{f^{x}}{2b\left(b+af^{2x}\right)\log(f)}+\right.}{a}$$

$$= -\frac{f^{x}x}{4a\left(b+af^{2x}\right)^2\log(f)}+\frac{f^{x}x}{8ab\left(b+af^{2x}\right)\log(f)}+\frac{x\tan^{-1}\left(\frac{\sqrt{a}f^{x}}{\sqrt{b}}\right)}{8a^{3/2}b^{3/2}\log(f)}+\frac{\int \frac{f^{x}}{\left(b+af^{2x}\right)^2}\,dx}{4a\log(f)}+\frac{3\int}{8}$$

$$= -\frac{f^{x}x}{4a\left(b+af^{2x}\right)^2\log(f)}+\frac{f^{x}x}{8ab\left(b+af^{2x}\right)\log(f)}+\frac{x\tan^{-1}\left(\frac{\sqrt{a}f^{x}}{\sqrt{b}}\right)}{8a^{3/2}b^{3/2}\log(f)}+\frac{\text{Subst}\left(\int \frac{1}{\left(b+ax^2\right)^2}\,dx\right.}{4a\log^2(f)}$$

$$= \frac{f^{x}}{8ab\left(b+af^{2x}\right)\log^2(f)}-\frac{\tan^{-1}\left(\frac{\sqrt{a}f^{x}}{\sqrt{b}}\right)}{8a^{3/2}b^{3/2}\log^2(f)}-\frac{f^{x}x}{4a\left(b+af^{2x}\right)^2\log(f)}+\frac{f^{x}x}{8ab\left(b+af^{2x}\right)\log(}$$

$$= \frac{f^{x}}{8ab\left(b+af^{2x}\right)\log^2(f)}-\frac{f^{x}x}{4a\left(b+af^{2x}\right)^2\log(f)}+\frac{f^{x}x}{8ab\left(b+af^{2x}\right)\log(f)}+\frac{x\tan^{-1}\left(\frac{\sqrt{a}f^{x}}{\sqrt{b}}\right)}{8a^{3/2}b^{3/2}\log(f}$$

Mathematica [A] time = 0.22, size = 209, normalized size = 1.07

$$\frac{-\frac{i\text{Li}_2\left(-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{b^{3/2}}+\frac{i\text{Li}_2\left(\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{b^{3/2}}+\frac{ix\log(f)\log\left(1-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{b^{3/2}}-\frac{ix\log(f)\log\left(1+\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{b^{3/2}}+\frac{2\sqrt{a}f^x}{abf^{2x}+b^2}+\frac{2\sqrt{a}xf^x\log(f)}{abf^{2x}+b^2}-\frac{4\sqrt{a}xf^x\log(f)}{\left(af^{2x}+b\right)^2}}{16a^{3/2}\log^2(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[x/(b/f^x + a*f^x)^3,x]
```

```
[Out] ((2*Sqrt[a]*f^x)/(b^2 + a*b*f^(2*x)) - (4*Sqrt[a]*f^x*x*Log[f])/(b + a*f^(2
*x))^2 + (2*Sqrt[a]*f^x*x*Log[f])/(b^2 + a*b*f^(2*x)) + (I*x*Log[f]*Log[1 -
 (I*Sqrt[a]*f^x)/Sqrt[b]])/b^(3/2) - (I*x*Log[f]*Log[1 + (I*Sqrt[a]*f^x)/Sq
rt[b]])/b^(3/2) - (I*PolyLog[2, ((-I)*Sqrt[a]*f^x)/Sqrt[b]])/b^(3/2) + (I*P
olyLog[2, (I*Sqrt[a]*f^x)/Sqrt[b]])/b^(3/2))/(16*a^(3/2)*Log[f]^2)
```

fricas [B] time = 0.42, size = 352, normalized size = 1.80

$$\frac{2\left(a^2x\log(f)+a^2\right)f^{3x}-2\left(abx\log(f)-ab\right)f^x+\left(a^2f^{4x}\sqrt{-\frac{a}{b}}+2abf^{2x}\sqrt{-\frac{a}{b}}+b^2\sqrt{-\frac{a}{b}}\right)\text{Li}_2\left(f^x\sqrt{-\frac{a}{b}}\right)-\left(a^2f^4\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(b/(f^x)+a*f^x)^3,x, algorithm="fricas")
```

```
[Out] 1/16*(2*(a^2*x*log(f) + a^2)*f^(3*x) - 2*(a*b*x*log(f) - a*b)*f^x + (a^2*f^
(4*x)*sqrt(-a/b) + 2*a*b*f^(2*x)*sqrt(-a/b) + b^2*sqrt(-a/b))*dilog(f^x*sqr
t(-a/b)) - (a^2*f^(4*x)*sqrt(-a/b) + 2*a*b*f^(2*x)*sqrt(-a/b) + b^2*sqrt(-a
/b))*dilog(-f^x*sqrt(-a/b)) - (a^2*f^(4*x)*x*sqrt(-a/b)*log(f) + 2*a*b*f^(2
*x)*x*sqrt(-a/b)*log(f) + b^2*x*sqrt(-a/b)*log(f))*log(f^x*sqrt(-a/b) + 1)
+ (a^2*f^(4*x)*x*sqrt(-a/b)*log(f) + 2*a*b*f^(2*x)*x*sqrt(-a/b)*log(f) + b^
2*x*sqrt(-a/b)*log(f))*log(-f^x*sqrt(-a/b) + 1))/(a^4*b*f^(4*x)*log(f)^2 +
2*a^3*b^2*f^(2*x)*log(f)^2 + a^2*b^3*log(f)^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{x}{\left(af^x+\frac{b}{f^x}\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(b/(f^x)+a*f^x)^3,x, algorithm="giac")
```

```
[Out] integrate(x/(a*f^x + b/f^x)^3, x)
```

maple [A] time = 0.08, size = 209, normalized size = 1.07

$$\frac{x\ln\left(\frac{-a\,f^{x}+\sqrt{-ab}}{\sqrt{-ab}}\right)}{16\sqrt{-ab}\;ab\ln(f)}-\frac{x\ln\left(\frac{a\,f^{x}+\sqrt{-ab}}{\sqrt{-ab}}\right)}{16\sqrt{-ab}\;ab\ln(f)}+\frac{\left(ax\,f^{2x}\ln(f)-bx\ln(f)+a\,f^{2x}+b\right)f^{x}}{8\left(a\,f^{2x}+b\right)^{2}ab\ln(f)^{2}}+\frac{\operatorname{dilog}\left(\frac{-a\,f^{x}+\sqrt{-ab}}{\sqrt{-ab}}\right)}{16\sqrt{-ab}\;ab\ln(f)^{2}}-\frac{\operatorname{dilog}\left(\frac{a\,f^{x}+\sqrt{-}}{\sqrt{-}}\right.}{16\sqrt{-ab}\;ab\,\mathrm{l}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(b/(f^x)+a*f^x)^3,x)
```

```
[Out] 1/8*f^x*(ln(f)*(f^x)^2*a*x-ln(f)*b*x+a*(f^x)^2+b)/ln(f)^2/b/a/(a*(f^x)^2+b)
^2+1/16/ln(f)/a/b*x/(-a*b)^(1/2)*ln((-a*f^x+(-a*b)^(1/2))/(-a*b)^(1/2))-1/1
6/ln(f)/a/b*x/(-a*b)^(1/2)*ln((a*f^x+(-a*b)^(1/2))/(-a*b)^(1/2))+1/16/ln(f)
^2/a/b/(-a*b)^(1/2)*dilog((-a*f^x+(-a*b)^(1/2))/(-a*b)^(1/2))-1/16/ln(f)^2/
a/b/(-a*b)^(1/2)*dilog((a*f^x+(-a*b)^(1/2))/(-a*b)^(1/2))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\left(ax\log(f)+a\right)f^{3\,x}-\left(bx\log(f)-b\right)f^{x}}{8\left(a^{3}bf^{4\,x}\log(f)^{2}+2\,a^{2}b^{2}f^{2\,x}\log(f)^{2}+ab^{3}\log(f)^{2}\right)}+\int\frac{f^{x}x}{8\left(a^{2}bf^{2\,x}+ab^{2}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(b/(f^x)+a*f^x)^3,x, algorithm="maxima")
```

```
[Out] 1/8*((a*x*log(f) + a)*f^(3*x) - (b*x*log(f) - b)*f^x)/(a^3*b*f^(4*x)*log(f)
^2 + 2*a^2*b^2*f^(2*x)*log(f)^2 + a*b^3*log(f)^2) + integrate(1/8*f^x*x/(a^
2*b*f^(2*x) + a*b^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{x}{{\left(\frac{b}{f^{x}}+a\,f^{x}\right)}^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(b/f^x + a*f^x)^3,x)
```

```
[Out] int(x/(b/f^x + a*f^x)^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{f^{3x}\left(ax\log\left(f\right)+a\right)+f^{x}\left(-bx\log\left(f\right)+b\right)}{8a^{3}bf^{4x}\log\left(f\right)^{2}+16a^{2}b^{2}f^{2x}\log\left(f\right)^{2}+8ab^{3}\log\left(f\right)^{2}}+\frac{\int\frac{f^{x}x}{af^{2x}+b}\,dx}{8ab}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(b/(f**x)+a*f**x)**3,x)
```

```
[Out] (f**(3*x)*(a*x*log(f) + a) + f**x*(-b*x*log(f) + b))/(8*a**3*b*f**(4*x)*log
(f)**2 + 16*a**2*b**2*f**(2*x)*log(f)**2 + 8*a*b**3*log(f)**2) + Integral(f
**x*x/(a*f**(2*x) + b), x)/(8*a*b)
```

3.64 $\int \frac{x^2}{\left(bf^{-x}+af^x\right)^3}\,dx$

Optimal. Leaf size=316

$$\frac{i\text{Li}_3\left(-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{8a^{3/2}b^{3/2}\log^3(f)}-\frac{i\text{Li}_3\left(\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{8a^{3/2}b^{3/2}\log^3(f)}-\frac{ix\text{Li}_2\left(-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{8a^{3/2}b^{3/2}\log^2(f)}+\frac{ix\text{Li}_2\left(\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{8a^{3/2}b^{3/2}\log^2(f)}+\frac{x^2\tan^{-1}\left(\frac{\sqrt{a}f^x}{\sqrt{b}}\right)}{8a^{3/2}b^{3/2}\log(f)}-\frac{\tan^{-1}\left(\frac{\sqrt{a}f^x}{\sqrt{b}}\right)}{4a^{3/2}b^{3/2}\log^3(f)}+\frac{}{8a}$$

```
[Out] -1/4*arctan(f^x*a^(1/2)/b^(1/2))/a^(3/2)/b^(3/2)/ln(f)^3+1/4*f^x*x/a/b/(b+a
*f^(2*x))/ln(f)^2-1/4*f^x*x^2/a/(b+a*f^(2*x))^2/ln(f)+1/8*f^x*x^2/a/b/(b+a*
f^(2*x))/ln(f)+1/8*x^2*arctan(f^x*a^(1/2)/b^(1/2))/a^(3/2)/b^(3/2)/ln(f)-1/
8*I*x*polylog(2,-I*f^x*a^(1/2)/b^(1/2))/a^(3/2)/b^(3/2)/ln(f)^2+1/8*I*x*pol
ylog(2,I*f^x*a^(1/2)/b^(1/2))/a^(3/2)/b^(3/2)/ln(f)^2+1/8*I*polylog(3,-I*f^
x*a^(1/2)/b^(1/2))/a^(3/2)/b^(3/2)/ln(f)^3-1/8*I*polylog(3,I*f^x*a^(1/2)/b^
(1/2))/a^(3/2)/b^(3/2)/ln(f)^3
```

Rubi [A] time = 1.16, antiderivative size = 316, normalized size of antiderivative = 1.00, number of steps used = 43, number of rules used = 14, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.737, Rules used = {2283, 2254, 2249, 199, 205, 2245, 14, 2282, 4848, 2391, 12, 5143, 2531, 6589}

$$-\frac{ix\text{PolyLog}\left(2,-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{8a^{3/2}b^{3/2}\log^2(f)}+\frac{ix\text{PolyLog}\left(2,\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{8a^{3/2}b^{3/2}\log^2(f)}+\frac{i\text{PolyLog}\left(3,-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{8a^{3/2}b^{3/2}\log^3(f)}-\frac{i\text{PolyLog}\left(3,\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)}{8a^{3/2}b^{3/2}\log^3(f)}+\frac{x^2\tan^{-1}\left(\frac{\sqrt{a}f^x}{\sqrt{b}}\right)}{8a^{3/2}b^{3/2}\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/(b/f^x + a*f^x)^3,x]
```

```
[Out] -ArcTan[(Sqrt[a]*f^x)/Sqrt[b]]/(4*a^(3/2)*b^(3/2)*Log[f]^3) + (f^x*x)/(4*a*
b*(b + a*f^(2*x))*Log[f]^2) - (f^x*x^2)/(4*a*(b + a*f^(2*x))^2*Log[f]) + (f
^x*x^2)/(8*a*b*(b + a*f^(2*x))*Log[f]) + (x^2*ArcTan[(Sqrt[a]*f^x)/Sqrt[b]]
)/(8*a^(3/2)*b^(3/2)*Log[f]) - ((I/8)*x*PolyLog[2, ((-I)*Sqrt[a]*f^x)/Sqrt[
b]])/(a^(3/2)*b^(3/2)*Log[f]^2) + ((I/8)*x*PolyLog[2, (I*Sqrt[a]*f^x)/Sqrt[
b]])/(a^(3/2)*b^(3/2)*Log[f]^2) + ((I/8)*PolyLog[3, ((-I)*Sqrt[a]*f^x)/Sqrt
[b]])/(a^(3/2)*b^(3/2)*Log[f]^3) - ((I/8)*PolyLog[3, (I*Sqrt[a]*f^x)/Sqrt[b
]])/(a^(3/2)*b^(3/2)*Log[f]^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2245

```
Int[(F_)^((e_.)*((c_.) + (d_.)*(x_)))*((a_.) + (b_.)*(F_)^(v_))^(p_)*(x_)^(
m_.), x_Symbol] :> With[{u = IntHide[F^(e*(c + d*x))*(a + b*F^v)^p, x]}, Di
st[x^m, u, x] - Dist[m, Int[x^(m - 1)*u, x], x]] /; FreeQ[{F, a, b, c, d, e
}, x] && EqQ[v, 2*e*(c + d*x)] && GtQ[m, 0] && ILtQ[p, 0]
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rule 2254

```
Int[((a_.) + (b_.)*(F_)^(u_))^(p_.)*((c_.) + (d_.)*(F_)^(v_))^(q_.)*((e_.)
+ (f_.)*(x_))^(m_.), x_Symbol] :> With[{w = ExpandIntegrand[(e + f*x)^m, (a
 + b*F^u)^p*(c + d*F^v)^q, x]}, Int[w, x] /; SumQ[w]] /; FreeQ[{F, a, b, c,
 d, e, f, m}, x] && IntegersQ[p, q] && LinearQ[{u, v}, x] && RationalQ[Simp
lify[u/v]]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2283

```
Int[(u_.)*((a_.)*(F_)^(v_) + (b_.)*(F_)^(w_))^(n_), x_Symbol] :> Int[u*F^(n
*v)*(a + b*F^ExpandToSum[w - v, x])^n, x] /; FreeQ[{F, a, b, n}, x] && ILtQ
[n, 0] && LinearQ[{v, w}, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 5143

```
Int[ArcTan[(a_.) + (b_.)*(f_)^((c_.) + (d_.)*(x_))]*(x_)^(m_.), x_Symbol] :
> Dist[I/2, Int[x^m*Log[1 - I*a - I*b*f^(c + d*x)], x], x] - Dist[I/2, Int[
x^m*Log[1 + I*a + I*b*f^(c + d*x)], x], x] /; FreeQ[{a, b, c, d, f}, x] &&
IntegerQ[m] && m > 0
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x^2}{\left(bf^{-x}+af^x\right)^3}\,dx = \int \frac{f^{3x}x^2}{\left(b+af^{2x}\right)^3}\,dx$$

$$= \int \left(-\frac{bf^x x^2}{a\left(b+af^{2x}\right)^3} + \frac{f^x x^2}{a\left(b+af^{2x}\right)^2}\right)dx$$

$$= \frac{\int \frac{f^x x^2}{\left(b+af^{2x}\right)^2}\,dx}{a} - \frac{b\int \frac{f^x x^2}{\left(b+af^{2x}\right)^3}\,dx}{a}$$

$$= -\frac{f^x x^2}{4a\left(b+af^{2x}\right)^2\log(f)} + \frac{f^x x^2}{8ab\left(b+af^{2x}\right)\log(f)} + \frac{x^2\tan^{-1}\left(\frac{\sqrt{a}f^x}{\sqrt{b}}\right)}{8a^{3/2}b^{3/2}\log(f)} - \frac{2\int x\left(\frac{f^x}{2b\left(b+af^{2x}\right)\log(\ldots}\right.}{}$$

$$= -\frac{f^x x^2}{4a\left(b+af^{2x}\right)^2\log(f)} + \frac{f^x x^2}{8ab\left(b+af^{2x}\right)\log(f)} + \frac{x^2\tan^{-1}\left(\frac{\sqrt{a}f^x}{\sqrt{b}}\right)}{8a^{3/2}b^{3/2}\log(f)} - \frac{2\int\left(\frac{f^x x}{2b\left(b+af^{2x}\right)\log(f)}\right.}{a\ldots}$$

$$= -\frac{f^x x^2}{4a\left(b+af^{2x}\right)^2\log(f)} + \frac{f^x x^2}{8ab\left(b+af^{2x}\right)\log(f)} + \frac{x^2\tan^{-1}\left(\frac{\sqrt{a}f^x}{\sqrt{b}}\right)}{8a^{3/2}b^{3/2}\log(f)} + \frac{\int \frac{f^x x}{\left(b+af^{2x}\right)^2}\,dx}{2a\log(f)} + \frac{3\ldots}{}$$

$$= \frac{f^x x}{4ab\left(b+af^{2x}\right)\log^2(f)} - \frac{f^x x^2}{4a\left(b+af^{2x}\right)^2\log(f)} + \frac{f^x x^2}{8ab\left(b+af^{2x}\right)\log(f)} + \frac{x^2\tan^{-1}\left(\frac{\sqrt{a}f^x}{\sqrt{b}}\right)}{8a^{3/2}b^{3/2}\log(f\ldots}$$

$$= \frac{f^x x}{4ab\left(b+af^{2x}\right)\log^2(f)} - \frac{f^x x^2}{4a\left(b+af^{2x}\right)^2\log(f)} + \frac{f^x x^2}{8ab\left(b+af^{2x}\right)\log(f)} + \frac{x^2\tan^{-1}\left(\frac{\sqrt{a}f^x}{\sqrt{b}}\right)}{8a^{3/2}b^{3/2}\log(f\ldots}$$

$$= \frac{f^x x}{4ab\left(b+af^{2x}\right)\log^2(f)} - \frac{f^x x^2}{4a\left(b+af^{2x}\right)^2\log(f)} + \frac{f^x x^2}{8ab\left(b+af^{2x}\right)\log(f)} + \frac{x^2\tan^{-1}\left(\frac{\sqrt{a}f^x}{\sqrt{b}}\right)}{8a^{3/2}b^{3/2}\log(f\ldots}$$

$$= -\frac{\tan^{-1}\left(\frac{\sqrt{a}f^x}{\sqrt{b}}\right)}{4a^{3/2}b^{3/2}\log^3(f)} + \frac{f^x x}{4ab\left(b+af^{2x}\right)\log^2(f)} - \frac{f^x x^2}{4a\left(b+af^{2x}\right)^2\log(f)} + \frac{f^x x^2}{8ab\left(b+af^{2x}\right)\log\ldots}$$

$$= -\frac{\tan^{-1}\left(\frac{\sqrt{a}f^x}{\sqrt{b}}\right)}{4a^{3/2}b^{3/2}\log^3(f)} + \frac{f^x x}{4ab\left(b+af^{2x}\right)\log^2(f)} - \frac{f^x x^2}{4a\left(b+af^{2x}\right)^2\log(f)} + \frac{f^x x^2}{8ab\left(b+af^{2x}\right)\log\ldots}$$

Mathematica [A] time = 0.52, size = 254, normalized size = 0.80

$$\frac{\frac{3i\left(2\text{Li}_3\left(-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)-2\text{Li}_3\left(\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)-2x\log(f)\text{Li}_2\left(-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)+2x\log(f)\text{Li}_2\left(\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)+x^2\log^2(f)\log\left(1-\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)-x^2\log^2(f)\log\left(1+\frac{i\sqrt{a}f^x}{\sqrt{b}}\right)\right)}{b^{3/2}}-\frac{12\tan^{-1}(}{b^{3/}}}{48a^{3/2}\log^3(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/(b/f^x + a*f^x)^3,x]
```

```
[Out] ((-12*ArcTan[(Sqrt[a]*f^x)/Sqrt[b]])/b^(3/2) - (12*Sqrt[a]*f^x*x^2*Log[f]^2
)/(b + a*f^(2*x))^2 + (6*Sqrt[a]*f^x*x*Log[f]*(2 + x*Log[f]))/(b*(b + a*f^(
2*x))) + ((3*I)*(x^2*Log[f]^2*Log[1 - (I*Sqrt[a]*f^x)/Sqrt[b]] - x^2*Log[f]
^2*Log[1 + (I*Sqrt[a]*f^x)/Sqrt[b]] - 2*x*Log[f]*PolyLog[2, ((-I)*Sqrt[a]*f
^x)/Sqrt[b]] + 2*x*Log[f]*PolyLog[2, (I*Sqrt[a]*f^x)/Sqrt[b]] + 2*PolyLog[3
, ((-I)*Sqrt[a]*f^x)/Sqrt[b]] - 2*PolyLog[3, (I*Sqrt[a]*f^x)/Sqrt[b]]))/b^(
3/2))/(48*a^(3/2)*Log[f]^3)
```

fricas [C] time = 0.44, size = 674, normalized size = 2.13

$$\frac{2\left(a^2x^2\log(f)^2+2a^2x\log(f)\right)f^{3x}-2\left(abx^2\log(f)^2-2abx\log(f)\right)f^x+2\left(a^2f^{4x}x\sqrt{-\frac{a}{b}}\log(f)+2abf^{2x}x\sqrt{-}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(b/(f^x)+a*f^x)^3,x, algorithm="fricas")
```

```
[Out] 1/16*(2*(a^2*x^2*log(f)^2 + 2*a^2*x*log(f))*f^(3*x) - 2*(a*b*x^2*log(f)^2 -
 2*a*b*x*log(f))*f^x + 2*(a^2*f^(4*x)*x*sqrt(-a/b)*log(f) + 2*a*b*f^(2*x)*x
*sqrt(-a/b)*log(f) + b^2*x*sqrt(-a/b)*log(f))*dilog(f^x*sqrt(-a/b)) - 2*(a^
2*f^(4*x)*x*sqrt(-a/b)*log(f) + 2*a*b*f^(2*x)*x*sqrt(-a/b)*log(f) + b^2*x*s
qrt(-a/b)*log(f))*dilog(-f^x*sqrt(-a/b)) - 2*(a^2*f^(4*x)*sqrt(-a/b) + 2*a*
b*f^(2*x)*sqrt(-a/b) + b^2*sqrt(-a/b))*log(2*a*f^x + 2*b*sqrt(-a/b)) + 2*(a
^2*f^(4*x)*sqrt(-a/b) + 2*a*b*f^(2*x)*sqrt(-a/b) + b^2*sqrt(-a/b))*log(2*a*
f^x - 2*b*sqrt(-a/b)) - (a^2*f^(4*x)*x^2*sqrt(-a/b)*log(f)^2 + 2*a*b*f^(2*x
)*x^2*sqrt(-a/b)*log(f)^2 + b^2*x^2*sqrt(-a/b)*log(f)^2)*log(f^x*sqrt(-a/b)
 + 1) + (a^2*f^(4*x)*x^2*sqrt(-a/b)*log(f)^2 + 2*a*b*f^(2*x)*x^2*sqrt(-a/b)
*log(f)^2 + b^2*x^2*sqrt(-a/b)*log(f)^2)*log(-f^x*sqrt(-a/b) + 1) - 2*(a^2*
f^(4*x)*sqrt(-a/b) + 2*a*b*f^(2*x)*sqrt(-a/b) + b^2*sqrt(-a/b))*polylog(3,
f^x*sqrt(-a/b)) + 2*(a^2*f^(4*x)*sqrt(-a/b) + 2*a*b*f^(2*x)*sqrt(-a/b) + b^
2*sqrt(-a/b))*polylog(3, -f^x*sqrt(-a/b)))/(a^4*b*f^(4*x)*log(f)^3 + 2*a^3*
b^2*f^(2*x)*log(f)^3 + a^2*b^3*log(f)^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\left(af^x + \frac{b}{f^x}\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(b/(f^x)+a*f^x)^3,x, algorithm="giac")
```

```
[Out] integrate(x^2/(a*f^x + b/f^x)^3, x)
```

maple [F] time = 0.17, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\left(a\,f^x + b\,f^{-x}\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(b/(f^x)+a*f^x)^3,x)
```

```
[Out] int(x^2/(b/(f^x)+a*f^x)^3,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\left(ax^2\log(f) + 2\,ax\right)f^{3\,x} - \left(bx^2\log(f) - 2\,bx\right)f^x}{8\left(a^3bf^{4\,x}\log(f)^2 + 2\,a^2b^2f^{2\,x}\log(f)^2 + ab^3\log(f)^2\right)} + \int \frac{\left(x^2\log(f)^2 - 2\right)f^x}{8\left(a^2bf^{2\,x}\log(f)^2 + ab^2\log(f)^2\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(b/(f^x)+a*f^x)^3,x, algorithm="maxima")
```

```
[Out] 1/8*((a*x^2*log(f) + 2*a*x)*f^(3*x) - (b*x^2*log(f) - 2*b*x)*f^x)/(a^3*b*f^
(4*x)*log(f)^2 + 2*a^2*b^2*f^(2*x)*log(f)^2 + a*b^3*log(f)^2) + integrate(1
/8*(x^2*log(f)^2 - 2)*f^x/(a^2*b*f^(2*x)*log(f)^2 + a*b^2*log(f)^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2}{\left(\frac{b}{f^x} + a\,f^x\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(b/f^x + a*f^x)^3,x)
```

```
[Out] int(x^2/(b/f^x + a*f^x)^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{f^{3x}\left(ax^2\log(f)+2ax\right)+f^x\left(-bx^2\log(f)+2bx\right)}{8a^3bf^{4x}\log(f)^2+16a^2b^2f^{2x}\log(f)^2+8ab^3\log(f)^2}+\frac{\int\left(-\frac{2f^x}{af^{2x}+b}\right)dx+\int\frac{f^xx^2\log(f)^2}{af^{2x}+b}\,dx}{8ab\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(b/(f**x)+a*f**x)**3,x)
```

```
[Out] (f**(3*x)*(a*x**2*log(f) + 2*a*x) + f**x*(-b*x**2*log(f) + 2*b*x))/(8*a**3*
b*f**(4*x)*log(f)**2 + 16*a**2*b**2*f**(2*x)*log(f)**2 + 8*a*b**3*log(f)**2
) + (Integral(-2*f**x/(a*f**(2*x) + b), x) + Integral(f**x*x**2*log(f)**2/(
a*f**(2*x) + b), x))/(8*a*b*log(f)**2)
```

3.65 $\int f^{a+bx+cx^2} g^{d+ex+fx^2}\,dx$

Optimal. Leaf size=95

$$\frac{\sqrt{\pi}\, f^a g^d \exp\left(-\frac{(b\log(f)+e\log(g))^2}{4(c\log(f)+f\log(g))}\right)\operatorname{erfi}\left(\frac{b\log(f)+2x(c\log(f)+f\log(g))+e\log(g)}{2\sqrt{c\log(f)+f\log(g)}}\right)}{2\sqrt{c\log(f)+f\log(g)}}$$

```
[Out] 1/2*f^a*g^d*erfi(1/2*(b*ln(f)+e*ln(g)+2*x*(c*ln(f)+f*ln(g)))/(c*ln(f)+f*ln(
g))^(1/2))*Pi^(1/2)/exp(1/4*(b*ln(f)+e*ln(g))^2/(c*ln(f)+f*ln(g)))/(c*ln(f)
+f*ln(g))^(1/2)
```

Rubi [A] time = 0.18, antiderivative size = 95, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.120, Rules used = {2287, 2234, 2204}

$$\frac{\sqrt{\pi}\, f^a g^d \exp\left(-\frac{(b\log(f)+e\log(g))^2}{4(c\log(f)+f\log(g))}\right)\operatorname{Erfi}\left(\frac{b\log(f)+2x(c\log(f)+f\log(g))+e\log(g)}{2\sqrt{c\log(f)+f\log(g)}}\right)}{2\sqrt{c\log(f)+f\log(g)}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x + c*x^2)*g^(d + e*x + f*x^2),x]
```

```
[Out] (f^a*g^d*Sqrt[Pi]*Erfi[(b*Log[f] + e*Log[g] + 2*x*(c*Log[f] + f*Log[g]))/(2
*Sqrt[c*Log[f] + f*Log[g]])])/(2*E^((b*Log[f] + e*Log[g])^2/(4*(c*Log[f] +
f*Log[g])))*Sqrt[c*Log[f] + f*Log[g]])
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2234

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2287

```
Int[(u_.)*(F_)^(v_)*(G_)^(w_), x_Symbol] :> With[{z = v*Log[F] + w*Log[G]},
 Int[u*NormalizeIntegrand[E^z, x], x] /; BinomialQ[z, x] || (PolynomialQ[z,
 x] && LeQ[Exponent[z, x], 2])] /; FreeQ[{F, G}, x]
```

Rubi steps

$$\int f^{a+bx+cx^2} g^{d+ex+fx^2}\,dx = \int \exp\left(a\log(f)+d\log(g)+x(b\log(f)+e\log(g))+x^2(c\log(f)+f\log(g))\right)dx$$
$$= \left(\exp\left(-\frac{(b\log(f)+e\log(g))^2}{4(c\log(f)+f\log(g))}\right)f^a g^d\right)\int \exp\left(\frac{(b\log(f)+e\log(g)+2x(c\log(f)+f}{4(c\log(f)+f\log(g))}\right.$$
$$= \frac{\exp\left(-\frac{(b\log(f)+e\log(g))^2}{4(c\log(f)+f\log(g))}\right)f^a g^d\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\log(f)+e\log(g)+2x(c\log(f)+f\log(g))}{2\sqrt{c\log(f)+f\log(g)}}\right)}{2\sqrt{c\log(f)+f\log(g)}}$$

Mathematica [A] time = 0.07, size = 93, normalized size = 0.98

$$\frac{\sqrt{\pi}\,f^a g^d \exp\left(-\frac{(b\log(f)+e\log(g))^2}{4(c\log(f)+f\log(g))}\right)\mathrm{erfi}\left(\frac{\log(f)(b+2cx)+\log(g)(e+2fx)}{2\sqrt{c\log(f)+f\log(g)}}\right)}{2\sqrt{c\log(f)+f\log(g)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x + c*x^2)*g^(d + e*x + f*x^2),x]
```

```
[Out] (f^a*g^d*Sqrt[Pi]*Erfi[((b + 2*c*x)*Log[f] + (e + 2*f*x)*Log[g])/(2*Sqrt[c*
Log[f] + f*Log[g]])]])/(2*E^((b*Log[f] + e*Log[g])^2/(4*(c*Log[f] + f*Log[g]
)))*Sqrt[c*Log[f] + f*Log[g]])
```

fricas [A] time = 0.43, size = 135, normalized size = 1.42

$$-\frac{\sqrt{\pi}\sqrt{-c\log(f)-f\log(g)}\,\mathrm{erf}\left(\frac{\left((2cx+b)\log(f)+\left(2fx+e\right)\log(g)\right)\sqrt{-c\log(f)-f\log(g)}}{2\left(c\log(f)+f\log(g)\right)}\right)e^{\left(-\frac{\left(b^2-4ac\right)\log(f)^2-2\left(2cd-be+2af\right)\log(f)\log(g)+(}{4\left(c\log(f)+f\log(g)\right)}\right.}}{2\left(c\log(f)+f\log(g)\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*g^(f*x^2+e*x+d),x, algorithm="fricas")
```

```
[Out] -1/2*sqrt(pi)*sqrt(-c*log(f) - f*log(g))*erf(1/2*((2*c*x + b)*log(f) + (2*f
*x + e)*log(g))*sqrt(-c*log(f) - f*log(g))/(c*log(f) + f*log(g)))*e^(-1/4*(
(b^2 - 4*a*c)*log(f)^2 - 2*(2*c*d - b*e + 2*a*f)*log(f)*log(g) + (e^2 - 4*d
*f)*log(g)^2)/(c*log(f) + f*log(g)))/(c*log(f) + f*log(g))
```

giac [A] time = 0.46, size = 131, normalized size = 1.38

$$-\frac{\sqrt{\pi}\,\mathrm{erf}\left(-\frac{1}{2}\sqrt{-c\log(f)-f\log(g)}\left(2x+\frac{b\log(f)+e\log(g)}{c\log(f)+f\log(g)}\right)\right)e^{\left(-\frac{b^2\log(f)^2-4ac\log(f)^2-4cd\log(f)\log(g)-4af\log(f)\log(g)+2be\log(f)\log(g}{4\left(c\log(f)+f\log(g)\right)}\right.}}{2\sqrt{-c\log(f)-f\log(g)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*g^(f*x^2+e*x+d),x, algorithm="giac")
```

```
[Out] -1/2*sqrt(pi)*erf(-1/2*sqrt(-c*log(f) - f*log(g))*(2*x + (b*log(f) + e*log(
g))/(c*log(f) + f*log(g))))*e^(-1/4*(b^2*log(f)^2 - 4*a*c*log(f)^2 - 4*c*d*
log(f)*log(g) - 4*a*f*log(f)*log(g) + 2*b*e*log(f)*log(g) - 4*d*f*log(g)^2
+ e^2*log(g)^2)/(c*log(f) + f*log(g)))/sqrt(-c*log(f) - f*log(g))
```

maple [F] time = 0.05, size = 0, normalized size = 0.00

$$\int f^{c\,x^2+bx+a} g^{f\,x^2+ex+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*x^2+b*x+a)*g^(f*x^2+e*x+d),x)
```

```
[Out] int(f^(c*x^2+b*x+a)*g^(f*x^2+e*x+d),x)
```

maxima [A] time = 0.49, size = 90, normalized size = 0.95

$$\frac{\sqrt{\pi}\, f^a g^d \operatorname{erf}\left(\sqrt{-c\log(f)-f\log(g)}\,x-\frac{b\log(f)+e\log(g)}{2\sqrt{-c\log(f)-f\log(g)}}\right)e^{\left(-\frac{(b\log(f)+e\log(g))^2}{4(c\log(f)+f\log(g))}\right)}}{2\sqrt{-c\log(f)-f\log(g)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*g^(f*x^2+e*x+d),x, algorithm="maxima")
```

```
[Out] 1/2*sqrt(pi)*f^a*g^d*erf(sqrt(-c*log(f) - f*log(g))*x - 1/2*(b*log(f) + e*l
og(g))/sqrt(-c*log(f) - f*log(g)))*e^(-1/4*(b*log(f) + e*log(g))^2/(c*log(f
) + f*log(g)))/sqrt(-c*log(f) - f*log(g))
```

mupad [B] time = 0.10, size = 130, normalized size = 1.37

$$-\frac{f^a\,g^d\,\sqrt{\pi}\,\mathrm{e}^{-\frac{b^2\ln(f)^2}{4\left(c\,\ln(f)+f\,\ln(g)\right)}-\frac{e^2\ln(g)^2}{4\left(c\,\ln(f)+f\,\ln(g)\right)}-\frac{b\,e\,\ln(f)\,\ln(g)}{2\left(c\,\ln(f)+f\,\ln(g)\right)}}\,\operatorname{erf}\left(\frac{x\left(c\,\ln(f)+f\,\ln(g)\right)2\mathrm{i}+b\,\ln(f)\,1\mathrm{i}+e\,\ln(g)\,1\mathrm{i}}{2\sqrt{c\,\ln(f)+f\,\ln(g)}}\right)1\mathrm{i}}{2\sqrt{c\,\ln(f)+f\,\ln(g)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x + c*x^2)*g^(d + e*x + f*x^2),x)
```

```
[Out] -(f^a*g^d*pi^(1/2)*exp(- (b^2*log(f)^2)/(4*(c*log(f) + f*log(g))) - (e^2*lo
g(g)^2)/(4*(c*log(f) + f*log(g))) - (b*e*log(f)*log(g))/(2*(c*log(f) + f*lo
```

```
g(g))))*erf((x*(c*log(f) + f*log(g))*2i + b*log(f)*1i + e*log(g)*1i)/(2*(c*
log(f) + f*log(g))^(1/2)))*1i)/(2*(c*log(f) + f*log(g))^(1/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+bx+cx^2} g^{d+ex+fx^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*x**2+b*x+a)*g**(f*x**2+e*x+d),x)
```

```
[Out] Integral(f**(a + b*x + c*x**2)*g**(d + e*x + f*x**2), x)
```

3.66 $\int F^{e(c+dx)} \left(a + bG^{h(f+gx)}\right)^n \, dx$

Optimal. Leaf size=106

$$\frac{F^{e(c+dx)} \left(a + bG^{h(f+gx)}\right)^n \left(\frac{bG^{h(f+gx)}}{a} + 1\right)^{-n} {}_2F_1\left(-n, \frac{de\log(F)}{gh\log(G)}; \frac{de\log(F)}{gh\log(G)} + 1; -\frac{bG^{h(f+gx)}}{a}\right)}{de\log(F)}$$

```
[Out] F^(e*(d*x+c))*(a+b*G^(h*(g*x+f)))^n*hypergeom([-n, d*e*ln(F)/g/h/ln(G)],[1+
d*e*ln(F)/g/h/ln(G)],-b*G^(h*(g*x+f))/a)/d/e/((1+b*G^(h*(g*x+f))/a)^n)/ln(F
)
```

Rubi [A] time = 0.09, antiderivative size = 106, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.080, Rules used = {2252, 2251}

$$\frac{F^{e(c+dx)} \left(a + bG^{h(f+gx)}\right)^n \left(\frac{bG^{h(f+gx)}}{a} + 1\right)^{-n} {}_2F_1\left(-n, \frac{de\log(F)}{gh\log(G)}; \frac{de\log(F)}{gh\log(G)} + 1; -\frac{bG^{h(f+gx)}}{a}\right)}{de\log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(e*(c + d*x))*(a + b*G^(h*(f + g*x)))^n,x]
```

```
[Out] (F^(e*(c + d*x))*(a + b*G^(h*(f + g*x)))^n*Hypergeometric2F1[-n, (d*e*Log[F
])/(g*h*Log[G]), 1 + (d*e*Log[F])/(g*h*Log[G]), -((b*G^(h*(f + g*x)))/a)])/
(d*e*(1 + (b*G^(h*(f + g*x)))/a)^n*Log[F])
```

Rule 2251

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_)*(G_)^((h_.)*((f_.
) + (g_.)*(x_))), x_Symbol] :> Simp[(a^p*G^(h*(f + g*x))*Hypergeometric2F1[
-p, (g*h*Log[G])/(d*e*Log[F]), (g*h*Log[G])/(d*e*Log[F]) + 1, Simplify[-((b
*F^(e*(c + d*x)))/a)]])/(g*h*Log[G]), x] /; FreeQ[{F, G, a, b, c, d, e, f,
g, h, p}, x] && (ILtQ[p, 0] || GtQ[a, 0])
```

Rule 2252

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_)*(G_)^((h_.)*((f_.
) + (g_.)*(x_))), x_Symbol] :> Dist[(a + b*F^(e*(c + d*x)))^p/(1 + (b/a)*F^
(e*(c + d*x)))^p, Int[G^(h*(f + g*x))*(1 + (b*F^(e*(c + d*x)))/a)^p, x], x]
 /; FreeQ[{F, G, a, b, c, d, e, f, g, h, p}, x] &&  !(ILtQ[p, 0] || GtQ[a,
0])
```

Rubi steps

$$\int F^{e(c+dx)}\left(a+bG^{h(f+gx)}\right)^n dx=\left(\left(a+bG^{h(f+gx)}\right)^n\left(1+\frac{bG^{h(f+gx)}}{a}\right)^{-n}\right)\int F^{e(c+dx)}\left(1+\frac{bG^{h(f+gx)}}{a}\right)^n dx$$
$$=\frac{F^{e(c+dx)}\left(a+bG^{h(f+gx)}\right)^n\left(1+\frac{bG^{h(f+gx)}}{a}\right)^{-n}{}_2F_1\left(-n,\frac{de\log(F)}{gh\log(G)};1+\frac{de\log(F)}{gh\log(G)};-\frac{bG^{h(f\cdot}}{a}\right.}{de\log(F)}$$

Mathematica [A] time = 0.05, size = 92, normalized size = 0.87

$$\frac{F^{e(c+dx)}\left(a+bG^{h(f+gx)}\right)^{n+1}{}_2F_1\left(1,n+\frac{de\log(F)}{gh\log(G)}+1;\frac{de\log(F)}{gh\log(G)}+1;-\frac{bG^{h(f+gx)}}{a}\right)}{ade\log(F)}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[F^(e*(c + d*x))*(a + b*G^(h*(f + g*x)))^n,x]
[Out] (F^(e*(c + d*x))*(a + b*G^(h*(f + g*x)))^(1 + n)*Hypergeometric2F1[1, 1 + n
 + (d*e*Log[F])/(g*h*Log[G]), 1 + (d*e*Log[F])/(g*h*Log[G]), -((b*G^(h*(f +
 g*x)))/a)])/(a*d*e*Log[F])
```

fricas [F] time = 0.42, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\left(G^{ghx+fh}b+a\right)^n F^{dex+ce},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(e*(d*x+c))*(a+b*G^(h*(g*x+f)))^n,x, algorithm="fricas")
[Out] integral((G^(g*h*x + f*h)*b + a)^n*F^(d*e*x + c*e), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\left(G^{(gx+f)h}b+a\right)^n F^{(dx+c)e}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(e*(d*x+c))*(a+b*G^(h*(g*x+f)))^n,x, algorithm="giac")
[Out] integrate((G^((g*x + f)*h)*b + a)^n*F^((d*x + c)*e), x)
```

maple [F] time = 0.12, size = 0, normalized size = 0.00

$$\int F^{(dx+c)e}\left(b\,G^{(gx+f)h}+a\right)^n dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^((d*x+c)*e)*(a+b*G^((g*x+f)*h))^n,x)
```

```
[Out] int(F^((d*x+c)*e)*(a+b*G^((g*x+f)*h))^n,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(G^{\left(gx+f\right)h}b+a\right)^{n}F^{(dx+c)e}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(e*(d*x+c))*(a+b*G^(h*(g*x+f)))^n,x, algorithm="maxima")
```

```
[Out] integrate((G^((g*x + f)*h)*b + a)^n*F^((d*x + c)*e), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int F^{e\,(c+d\,x)}\,\left(a+G^{h\,\left(f+g\,x\right)}\,b\right)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(e*(c + d*x))*(a + G^(h*(f + g*x))*b)^n,x)
```

```
[Out] int(F^(e*(c + d*x))*(a + G^(h*(f + g*x))*b)^n, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(e*(d*x+c))*(a+b*G**(h*(g*x+f)))**n,x)
```

```
[Out] Timed out
```

3.67 $\int \frac{F^{e(c+dx)}H^{t(r+sx)}}{a+bF^{e(c+dx)}}\,dx$

Optimal. Leaf size=75

$$\frac{H^{t(r+sx)}\,{}_2F_1\left(1,-\frac{st\log(H)}{de\log(F)};1-\frac{st\log(H)}{de\log(F)};-\frac{aF^{-e(c+dx)}}{b}\right)}{bst\log(H)}$$

```
[Out] H^(t*(s*x+r))*hypergeom([1, -s*t*ln(H)/d/e/ln(F)],[1-s*t*ln(H)/d/e/ln(F)],-
a/b/(F^(e*(d*x+c))))/b/s/t/ln(H)
```

Rubi [A] time = 0.13, antiderivative size = 75, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 34, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.059, Rules used = {2256, 2251}

$$\frac{H^{t(r+sx)}\,{}_2F_1\left(1,-\frac{st\log(H)}{de\log(F)};1-\frac{st\log(H)}{de\log(F)};-\frac{aF^{-e(c+dx)}}{b}\right)}{bst\log(H)}$$

Antiderivative was successfully verified.

```
[In] Int[(F^(e*(c + d*x))*H^(t*(r + s*x)))/(a + b*F^(e*(c + d*x))),x]
```

```
[Out] (H^(t*(r + s*x))*Hypergeometric2F1[1, -((s*t*Log[H])/(d*e*Log[F])), 1 - (s*
t*Log[H])/(d*e*Log[F]), -(a/(b*F^(e*(c + d*x))))])/(b*s*t*Log[H])
```

Rule 2251

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_)*(G_)^((h_.)*((f_.
) + (g_.)*(x_))), x_Symbol] :> Simp[(a^p*G^(h*(f + g*x))*Hypergeometric2F1[
-p, (g*h*Log[G])/(d*e*Log[F]), (g*h*Log[G])/(d*e*Log[F]) + 1, Simplify[-((b
*F^(e*(c + d*x)))/a)]])/(g*h*Log[G]), x] /; FreeQ[{F, G, a, b, c, d, e, f,
g, h, p}, x] && (ILtQ[p, 0] || GtQ[a, 0])
```

Rule 2256

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_)))*(H_)^((t_.)*((r_.) + (s_.)*(x_))), x_Symbol] :> Dist[G^((
f - (c*g)/d)*h), Int[H^(t*(r + s*x))*(b + a/F^(e*(c + d*x)))^p, x], x] /; F
reeQ[{F, G, H, a, b, c, d, e, f, g, h, r, s, t}, x] && EqQ[d*e*p*Log[F] + g
*h*Log[G], 0] && IntegerQ[p]
```

Rubi steps

$$\int \frac{F^{e(c+dx)}H^{t(r+sx)}}{a+bF^{e(c+dx)}}\,dx = \int \frac{H^{t(r+sx)}}{b+aF^{-e(c+dx)}}\,dx$$
$$= \frac{H^{t(r+sx)}\,{}_2F_1\left(1,-\frac{st\log(H)}{de\log(F)};1-\frac{st\log(H)}{de\log(F)};-\frac{aF^{-e(c+dx)}}{b}\right)}{bst\log(H)}$$

Mathematica [A] time = 0.17, size = 75, normalized size = 1.00

$$-\frac{H^{t(r+sx)}\left({}_2F_1\left(1,\frac{st\log(H)}{de\log(F)};\frac{st\log(H)}{de\log(F)}+1;-\frac{bF^{e(c+dx)}}{a}\right)-1\right)}{bst\log(H)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(F^(e*(c + d*x))*H^(t*(r + s*x)))/(a + b*F^(e*(c + d*x))),x]
```

```
[Out] -((H^(t*(r + s*x))*(-1 + Hypergeometric2F1[1, (s*t*Log[H])/(d*e*Log[F]), 1
+ (s*t*Log[H])/(d*e*Log[F]), -((b*F^(e*(c + d*x)))/a)]))/(b*s*t*Log[H]))
```

fricas [F] time = 0.40, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{F^{dex+ce}H^{stx+rt}}{F^{dex+ce}b+a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(e*(d*x+c))*H^(t*(s*x+r))/(a+b*F^(e*(d*x+c))),x, algorithm="fri
cas")
```

```
[Out] integral(F^(d*e*x + c*e)*H^(s*t*x + r*t)/(F^(d*e*x + c*e)*b + a), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)e}H^{(sx+r)t}}{F^{(dx+c)e}b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(e*(d*x+c))*H^(t*(s*x+r))/(a+b*F^(e*(d*x+c))),x, algorithm="gia
c")
```

```
[Out] integrate(F^((d*x + c)*e)*H^((s*x + r)*t)/(F^((d*x + c)*e)*b + a), x)
```

maple [F] time = 0.05, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)e} H^{(sx+r)t}}{b\,F^{(dx+c)e}+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^((d*x+c)*e)*H^(t*(s*x+r))/(a+b*F^((d*x+c)*e)),x)
```

```
[Out] int(F^((d*x+c)*e)*H^(t*(s*x+r))/(a+b*F^((d*x+c)*e)),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-H^{rt}a^2de\int \frac{H^{stx}}{a^2bde\log(F)-a^2bst\log(H)+\left(F^{2\,ce}b^3de\log(F)-F^{2\,ce}b^3st\log(H)\right)F^{2\,dex}+2\left(F^{ce}ab^2de\log(F)-F^{ce}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(e*(d*x+c))*H^(t*(s*x+r))/(a+b*F^(e*(d*x+c))),x, algorithm="max
ima")
```

```
[Out] -H^(r*t)*a^2*d*e*integrate(H^(s*t*x)/(a^2*b*d*e*log(F) - a^2*b*s*t*log(H) +
 (F^(2*c*e)*b^3*d*e*log(F) - F^(2*c*e)*b^3*s*t*log(H))*F^(2*d*e*x) + 2*(F^(
c*e)*a*b^2*d*e*log(F) - F^(c*e)*a*b^2*s*t*log(H))*F^(d*e*x)), x)*log(F) + (
H^(r*t)*a*d*e*log(F) + (F^(c*e)*H^(r*t)*b*d*e*log(F) - F^(c*e)*H^(r*t)*b*s*
t*log(H))*F^(d*e*x))*H^(s*t*x)/(a*b*d*e*s*t*log(F)*log(H) - a*b*s^2*t^2*log
(H)^2 + (F^(c*e)*b^2*d*e*s*t*log(F)*log(H) - F^(c*e)*b^2*s^2*t^2*log(H)^2)*
F^(d*e*x))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{F^{e\,(c+d\,x)}\,H^{t\,(r+s\,x)}}{a+F^{e\,(c+d\,x)}\,b}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((F^(e*(c + d*x))*H^(t*(r + s*x)))/(a + F^(e*(c + d*x))*b),x)
```

```
[Out] int((F^(e*(c + d*x))*H^(t*(r + s*x)))/(a + F^(e*(c + d*x))*b), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{e(c+dx)}H^{t(r+sx)}}{F^{ce}F^{dex}b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(e*(d*x+c))*H**(t*(s*x+r))/(a+b*F**(e*(d*x+c))),x)
```

```
[Out] Integral(F**(e*(c + d*x))*H**(t*(r + s*x))/(F**(c*e)*F**(d*e*x)*b + a), x)
```

3.68 $\int \frac{F^{e(f+dx)}H^{t(r+sx)}}{a+bF^{e(c+dx)}}\,dx$

Optimal. Leaf size=85

$$\frac{F^{-e(c-f)}H^{t(r+sx)}\,{}_2F_1\left(1,-\frac{st\log(H)}{de\log(F)};1-\frac{st\log(H)}{de\log(F)};-\frac{aF^{-e(c+dx)}}{b}\right)}{bst\log(H)}$$

```
[Out] H^(t*(s*x+r))*hypergeom([1, -s*t*ln(H)/d/e/ln(F)],[1-s*t*ln(H)/d/e/ln(F)],-
a/b/(F^(e*(d*x+c))))/b/(F^(e*(c-f)))/s/t/ln(H)
```

Rubi [A] time = 0.13, antiderivative size = 85, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 34, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.059, Rules used = {2256, 2251}

$$\frac{F^{-e(c-f)}H^{t(r+sx)}\,{}_2F_1\left(1,-\frac{st\log(H)}{de\log(F)};1-\frac{st\log(H)}{de\log(F)};-\frac{aF^{-e(c+dx)}}{b}\right)}{bst\log(H)}$$

Antiderivative was successfully verified.

```
[In] Int[(F^(e*(f + d*x))*H^(t*(r + s*x)))/(a + b*F^(e*(c + d*x))),x]
```

```
[Out] (H^(t*(r + s*x))*Hypergeometric2F1[1, -((s*t*Log[H])/(d*e*Log[F])), 1 - (s*
t*Log[H])/(d*e*Log[F]), -(a/(b*F^(e*(c + d*x))))])/(b*F^(e*(c - f))*s*t*Log
[H])
```

Rule 2251

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_)*(G_)^((h_.)*((f_.
) + (g_.)*(x_))), x_Symbol] :> Simp[(a^p*G^(h*(f + g*x))*Hypergeometric2F1[
-p, (g*h*Log[G])/(d*e*Log[F]), (g*h*Log[G])/(d*e*Log[F]) + 1, Simplify[-((b
*F^(e*(c + d*x)))/a)]])/(g*h*Log[G]), x] /; FreeQ[{F, G, a, b, c, d, e, f,
g, h, p}, x] && (ILtQ[p, 0] || GtQ[a, 0])
```

Rule 2256

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_)))*(H_)^((t_.)*((r_.) + (s_.)*(x_))), x_Symbol] :> Dist[G^((
f - (c*g)/d)*h), Int[H^(t*(r + s*x))*(b + a/F^(e*(c + d*x)))^p, x], x] /; F
reeQ[{F, G, H, a, b, c, d, e, f, g, h, r, s, t}, x] && EqQ[d*e*p*Log[F] + g
*h*Log[G], 0] && IntegerQ[p]
```

Rubi steps

$$\int \frac{F^{e(f+dx)}H^{t(r+sx)}}{a+bF^{e(c+dx)}}\,dx = F^{-e(c-f)}\int \frac{H^{t(r+sx)}}{b+aF^{-e(c+dx)}}\,dx$$
$$= \frac{F^{-e(c-f)}H^{t(r+sx)}\,{}_2F_1\left(1,-\frac{st\log(H)}{de\log(F)};1-\frac{st\log(H)}{de\log(F)};-\frac{aF^{-e(c+dx)}}{b}\right)}{bst\log(H)}$$

Mathematica [A] time = 0.15, size = 84, normalized size = 0.99

$$-\frac{F^{e(f-c)}H^{t(r+sx)}\left({}_2F_1\left(1,\frac{st\log(H)}{de\log(F)};\frac{st\log(H)}{de\log(F)}+1;-\frac{bF^{e(c+dx)}}{a}\right)-1\right)}{bst\log(H)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(F^(e*(f + d*x))*H^(t*(r + s*x)))/(a + b*F^(e*(c + d*x))),x]
```

```
[Out] -((F^(e*(-c + f))*H^(t*(r + s*x))*(-1 + Hypergeometric2F1[1, (s*t*Log[H])/(
d*e*Log[F]), 1 + (s*t*Log[H])/(d*e*Log[F]), -((b*F^(e*(c + d*x)))/a)]))/(b*
s*t*Log[H]))
```

fricas [F] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{F^{dex+ef}H^{stx+rt}}{F^{dex+ce}b+a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(e*(d*x+f))*H^(t*(s*x+r))/(a+b*F^(e*(d*x+c))),x, algorithm="fri
cas")
```

```
[Out] integral(F^(d*e*x + e*f)*H^(s*t*x + r*t)/(F^(d*e*x + c*e)*b + a), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+f)e}H^{(sx+r)t}}{F^{(dx+c)e}b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(e*(d*x+f))*H^(t*(s*x+r))/(a+b*F^(e*(d*x+c))),x, algorithm="gia
c")
```

```
[Out] integrate(F^((d*x + f)*e)*H^((s*x + r)*t)/(F^((d*x + c)*e)*b + a), x)
```

maple [F] time = 0.07, size = 0, normalized size = 0.00

$$\int \frac{F^{\left(dx+f\right)e} H^{(sx+r)t}}{b\,F^{(dx+c)e}+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(e*(d*x+f))*H^((s*x+r)*t)/(b*F^((d*x+c)*e)+a),x)
```

```
[Out] int(F^(e*(d*x+f))*H^((s*x+r)*t)/(b*F^((d*x+c)*e)+a),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-F^{ef}H^{rt}a^2de\int \frac{H^{stx}}{F^{ce}a^2bde\log(F) - F^{ce}a^2bst\log(H) + \left(F^{3\,ce}b^3de\log(F) - F^{3\,ce}b^3st\log(H)\right)F^{2\,dex} + 2\left(F^{2\,ce}ab^2de\log\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(e*(d*x+f))*H^(t*(s*x+r))/(a+b*F^(e*(d*x+c))),x, algorithm="max
ima")
```

```
[Out] -F^(e*f)*H^(r*t)*a^2*d*e*integrate(H^(s*t*x)/(F^(c*e)*a^2*b*d*e*log(F) - F^
(c*e)*a^2*b*s*t*log(H) + (F^(3*c*e)*b^3*d*e*log(F) - F^(3*c*e)*b^3*s*t*log(
H))*F^(2*d*e*x) + 2*(F^(2*c*e)*a*b^2*d*e*log(F) - F^(2*c*e)*a*b^2*s*t*log(H
))*F^(d*e*x)), x)*log(F) + (F^(e*f)*H^(r*t)*a*d*e*log(F) + (F^(c*e + e*f)*H
^(r*t)*b*d*e*log(F) - F^(c*e + e*f)*H^(r*t)*b*s*t*log(H))*F^(d*e*x))*H^(s*t
*x)/(F^(c*e)*a*b*d*e*s*t*log(F)*log(H) - F^(c*e)*a*b*s^2*t^2*log(H)^2 + (F^
(2*c*e)*b^2*d*e*s*t*log(F)*log(H) - F^(2*c*e)*b^2*s^2*t^2*log(H)^2)*F^(d*e*
x))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{F^{e\,\left(f+d\,x\right)}\,H^{t\,(r+s\,x)}}{a+F^{e\,(c+d\,x)}\,b}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((F^(e*(f + d*x))*H^(t*(r + s*x)))/(a + F^(e*(c + d*x))*b),x)
```

```
[Out] int((F^(e*(f + d*x))*H^(t*(r + s*x)))/(a + F^(e*(c + d*x))*b), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{e\left(dx+f\right)}H^{t(r+sx)}}{F^{ce}F^{dex}b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(e*(d*x+f))*H**(t*(s*x+r))/(a+b*F**(e*(d*x+c))),x)
```

```
[Out] Integral(F**(e*(d*x + f))*H**(t*(r + s*x))/(F**(c*e)*F**(d*e*x)*b + a), x)
```

3.69 $\int f^{a+bx^2} x^m \, dx$

Optimal. Leaf size=46

$$-\frac{1}{2} f^a x^{m+1} \left(-bx^2 \log(f)\right)^{\frac{1}{2}(-m-1)} \Gamma\left(\frac{m+1}{2}, -bx^2 \log(f)\right)$$

```
[Out] -1/2*f^a*x^(1+m)*GAMMA(1/2+1/2*m,-b*x^2*ln(f))*(-b*x^2*ln(f))^(-1/2-1/2*m)
```

Rubi [A] time = 0.02, antiderivative size = 46, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2218}

$$-\frac{1}{2} f^a x^{m+1} \left(-bx^2 \log(f)\right)^{\frac{1}{2}(-m-1)} \text{Gamma}\left(\frac{m+1}{2}, -bx^2 \log(f)\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2)*x^m,x]
```

```
[Out] -(f^a*x^(1 + m)*Gamma[(1 + m)/2, -(b*x^2*Log[f])]*(-(b*x^2*Log[f]))^((-1 -
m)/2))/2
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+bx^2} x^m \, dx = -\frac{1}{2} f^a x^{1+m} \Gamma\left(\frac{1+m}{2}, -bx^2 \log(f)\right) \left(-bx^2 \log(f)\right)^{\frac{1}{2}(-1-m)}$$

Mathematica [A] time = 0.01, size = 46, normalized size = 1.00

$$-\frac{1}{2} f^a x^{m+1} \left(-bx^2 \log(f)\right)^{\frac{1}{2}(-m-1)} \Gamma\left(\frac{m+1}{2}, -bx^2 \log(f)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2)*x^m,x]
```

```
[Out] -1/2*(f^a*x^(1 + m)*Gamma[(1 + m)/2, -(b*x^2*Log[f])]*(-(b*x^2*Log[f]))^((-
1 - m)/2))
```

fricas [A] time = 0.42, size = 40, normalized size = 0.87

$$\frac{e^{\left(-\frac{1}{2}\,(m-1)\log\left(-b\log(f)\right)+a\log(f)\right)}\Gamma\left(\frac{1}{2}\,m+\frac{1}{2},-bx^2\log(f)\right)}{2\,b\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^m,x, algorithm="fricas")
```

```
[Out] 1/2*e^(-1/2*(m - 1)*log(-b*log(f)) + a*log(f))*gamma(1/2*m + 1/2, -b*x^2*lo
g(f))/(b*log(f))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{bx^2+a}x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^m,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^2 + a)*x^m, x)
```

maple [B] time = 0.06, size = 140, normalized size = 3.04

$$\frac{\left(\frac{2\left(\frac{m}{2}+\frac{1}{2}\right)x^{m+1}(-b)^{\frac{m}{2}+\frac{1}{2}}\left(-b\,x^2\ln(f)\right)^{-\frac{m}{2}-\frac{1}{2}}\ln(f)^{\frac{m}{2}+\frac{1}{2}}\Gamma\left(\frac{m}{2}+\frac{1}{2}\right)}{m+1}+\frac{2\left(-\frac{m}{2}-\frac{1}{2}\right)x^{m+1}(-b)^{\frac{m}{2}+\frac{1}{2}}\left(-b\,x^2\ln(f)\right)^{-\frac{m}{2}-\frac{1}{2}}\ln(f)^{\frac{m}{2}+\frac{1}{2}}\Gamma\left(\frac{m}{2}+\frac{1}{2},-b\,x^2\ln(f)\right)}{m+1}\right)f}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)*x^m,x)
```

```
[Out] 1/2*f^a*(-b)^(-1/2*m-1/2)*ln(f)^(-1/2*m-1/2)*(2/(m+1)*x^(m+1)*(-b)^(1/2*m+1
/2)*ln(f)^(1/2*m+1/2)*(1/2*m+1/2)*(-b*x^2*ln(f))^(-1/2*m-1/2)*GAMMA(1/2*m+1
/2)+2/(m+1)*x^(m+1)*(-b)^(1/2*m+1/2)*ln(f)^(1/2*m+1/2)*(-1/2*m-1/2)*(-b*x^2
*ln(f))^(-1/2*m-1/2)*GAMMA(1/2*m+1/2,-b*x^2*ln(f)))
```

maxima [A] time = 0.65, size = 38, normalized size = 0.83

$$-\frac{1}{2}\,\left(-bx^2\log(f)\right)^{-\frac{1}{2}\,m-\frac{1}{2}}\,f^a x^{m+1}\Gamma\left(\frac{1}{2}\,m+\frac{1}{2},-bx^2\log(f)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^m,x, algorithm="maxima")
```

```
[Out] -1/2*(-b*x^2*log(f))^(-1/2*m - 1/2)*f^a*x^(m + 1)*gamma(1/2*m + 1/2, -b*x^2
*log(f))
```

mupad [B] time = 3.63, size = 49, normalized size = 1.07

$$\frac{f^a\,x^{m+1}\,\left(\Gamma\left(\frac{m}{2}+\frac{1}{2}\right)-\Gamma\left(\frac{m}{2}+\frac{1}{2},-b\,x^2\,\ln(f)\right)\right)}{2\,\left(-b\,x^2\,\ln(f)\right)^{\frac{m}{2}+\frac{1}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)*x^m,x)
```

```
[Out] (f^a*x^(m + 1)*(gamma(m/2 + 1/2) - igamma(m/2 + 1/2, -b*x^2*log(f))))/(2*(-
b*x^2*log(f))^(m/2 + 1/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+bx^2}x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)*x**m,x)
```

```
[Out] Integral(f**(a + b*x**2)*x**m, x)
```

3.70 $\int f^{a+bx^2}x^{11}\,dx$

Optimal. Leaf size=78

$$-\frac{f^{a+bx^2}\left(-b^5x^{10}\log^5(f)+5b^4x^8\log^4(f)-20b^3x^6\log^3(f)+60b^2x^4\log^2(f)-120bx^2\log(f)+120\right)}{2b^6\log^6(f)}$$

```
[Out] -1/2*f^(b*x^2+a)*(120-120*b*x^2*ln(f)+60*b^2*x^4*ln(f)^2-20*b^3*x^6*ln(f)^3
+5*b^4*x^8*ln(f)^4-b^5*x^10*ln(f)^5)/b^6/ln(f)^6
```

Rubi [C] time = 0.03, antiderivative size = 24, normalized size of antiderivative = 0.31, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2218}

$$-\frac{f^a\text{Gamma}\left(6,-bx^2\log(f)\right)}{2b^6\log^6(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2)*x^11,x]
```

```
[Out] -(f^a*Gamma[6, -(b*x^2*Log[f])])/(2*b^6*Log[f]^6)
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+bx^2}x^{11}\,dx=-\frac{f^a\Gamma\left(6,-bx^2\log(f)\right)}{2b^6\log^6(f)}$$

Mathematica [C] time = 0.00, size = 24, normalized size = 0.31

$$-\frac{f^a\Gamma\left(6,-bx^2\log(f)\right)}{2b^6\log^6(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2)*x^11,x]
```

```
[Out] -1/2*(f^a*Gamma[6, -(b*x^2*Log[f])])/(b^6*Log[f]^6)
```

fricas [A] time = 0.42, size = 75, normalized size = 0.96

$$\frac{\left(b^{5} x^{10} \log\left(f\right)^{5} - 5 \, b^{4} x^{8} \log\left(f\right)^{4} + 20 \, b^{3} x^{6} \log\left(f\right)^{3} - 60 \, b^{2} x^{4} \log\left(f\right)^{2} + 120 \, b x^{2} \log\left(f\right) - 120\right)} f^{b x^{2} + a}}{2 \, b^{6} \log\left(f\right)^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^11,x, algorithm="fricas")
```

```
[Out] 1/2*(b^5*x^10*log(f)^5 - 5*b^4*x^8*log(f)^4 + 20*b^3*x^6*log(f)^3 - 60*b^2*
x^4*log(f)^2 + 120*b*x^2*log(f) - 120)*f^(b*x^2 + a)/(b^6*log(f)^6)
```

giac [A] time = 0.32, size = 79, normalized size = 1.01

$$\frac{\left(b^{5} x^{10} \log\left(f\right)^{5} - 5 \, b^{4} x^{8} \log\left(f\right)^{4} + 20 \, b^{3} x^{6} \log\left(f\right)^{3} - 60 \, b^{2} x^{4} \log\left(f\right)^{2} + 120 \, b x^{2} \log\left(f\right) - 120\right)} e^{\left(b x^{2} \log\left(f\right) + a \log\left(f\right)\right)}}{2 \, b^{6} \log\left(f\right)^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^11,x, algorithm="giac")
```

```
[Out] 1/2*(b^5*x^10*log(f)^5 - 5*b^4*x^8*log(f)^4 + 20*b^3*x^6*log(f)^3 - 60*b^2*
x^4*log(f)^2 + 120*b*x^2*log(f) - 120)*e^(b*x^2*log(f) + a*log(f))/(b^6*log
(f)^6)
```

maple [A] time = 0.01, size = 76, normalized size = 0.97

$$\frac{\left(b^{5} x^{10} \ln\left(f\right)^{5}-5 b^{4} x^{8} \ln\left(f\right)^{4}+20 b^{3} x^{6} \ln\left(f\right)^{3}-60 b^{2} x^{4} \ln\left(f\right)^{2}+120 b \,x^{2} \ln\left(f\right)-120\right) f^{b \,x^{2}+a}}{2 b^{6} \ln\left(f\right)^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)*x^11,x)
```

```
[Out] 1/2*(b^5*x^10*ln(f)^5-5*b^4*x^8*ln(f)^4+20*b^3*x^6*ln(f)^3-60*b^2*x^4*ln(f)
^2+120*b*x^2*ln(f)-120)*f^(b*x^2+a)/ln(f)^6/b^6
```

maxima [A] time = 0.45, size = 92, normalized size = 1.18

$$\frac{\left(b^{5} f^{a} x^{10} \log\left(f\right)^{5} - 5 \, b^{4} f^{a} x^{8} \log\left(f\right)^{4} + 20 \, b^{3} f^{a} x^{6} \log\left(f\right)^{3} - 60 \, b^{2} f^{a} x^{4} \log\left(f\right)^{2} + 120 \, b f^{a} x^{2} \log\left(f\right) - 120 \, f^{a}\right)} f^{b x^{2}}}{2 \, b^{6} \log\left(f\right)^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^11,x, algorithm="maxima")
```

```
[Out] 1/2*(b^5*f^a*x^10*log(f)^5 - 5*b^4*f^a*x^8*log(f)^4 + 20*b^3*f^a*x^6*log(f)
^3 - 60*b^2*f^a*x^4*log(f)^2 + 120*b*f^a*x^2*log(f) - 120*f^a)*f^(b*x^2)/(b
^6*log(f)^6)
```

mupad [B] time = 3.56, size = 76, normalized size = 0.97

$$-\frac{f^{b\,x^2+a}\,\left(-\frac{b^5\,x^{10}\,\ln(f)^5}{2}+\frac{5\,b^4\,x^8\,\ln(f)^4}{2}-10\,b^3\,x^6\,\ln(f)^3+30\,b^2\,x^4\,\ln(f)^2-60\,b\,x^2\,\ln(f)+60\right)}{b^6\,\ln(f)^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)*x^11,x)
```

```
[Out] -(f^(a + b*x^2)*(30*b^2*x^4*log(f)^2 - 10*b^3*x^6*log(f)^3 + (5*b^4*x^8*log
(f)^4)/2 - (b^5*x^10*log(f)^5)/2 - 60*b*x^2*log(f) + 60))/(b^6*log(f)^6)
```

sympy [A] time = 0.16, size = 95, normalized size = 1.22

$$\begin{cases} \frac{f^{a+bx^2}\left(b^5x^{10}\log{(f)}^5-5b^4x^8\log{(f)}^4+20b^3x^6\log{(f)}^3-60b^2x^4\log{(f)}^2+120bx^2\log{(f)}-120\right)}{2b^6\log{(f)}^6} & \text{for}\ 2b^6\log{(f)}^6\neq 0 \\ \frac{x^{12}}{12} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)*x**11,x)
```

```
[Out] Piecewise((f**(a + b*x**2)*(b**5*x**10*log(f)**5 - 5*b**4*x**8*log(f)**4 +
20*b**3*x**6*log(f)**3 - 60*b**2*x**4*log(f)**2 + 120*b*x**2*log(f) - 120)/
(2*b**6*log(f)**6), Ne(2*b**6*log(f)**6, 0)), (x**12/12, True))
```

3.71 $\int f^{a+bx^2} x^9 \, dx$

Optimal. Leaf size=65

$$\frac{f^{a+bx^2}\left(b^4x^8\log^4(f)-4b^3x^6\log^3(f)+12b^2x^4\log^2(f)-24bx^2\log(f)+24\right)}{2b^5\log^5(f)}$$

```
[Out] 1/2*f^(b*x^2+a)*(24-24*b*x^2*ln(f)+12*b^2*x^4*ln(f)^2-4*b^3*x^6*ln(f)^3+b^4
*x^8*ln(f)^4)/b^5/ln(f)^5
```

Rubi [C] time = 0.02, antiderivative size = 24, normalized size of antiderivative = 0.37, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2218}

$$\frac{f^a\text{Gamma}\left(5,-bx^2\log(f)\right)}{2b^5\log^5(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2)*x^9,x]
```

```
[Out] (f^a*Gamma[5, -(b*x^2*Log[f])])/(2*b^5*Log[f]^5)
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+bx^2}x^9\,dx=\frac{f^a\Gamma\left(5,-bx^2\log(f)\right)}{2b^5\log^5(f)}$$

Mathematica [C] time = 0.00, size = 24, normalized size = 0.37

$$\frac{f^a\Gamma\left(5,-bx^2\log(f)\right)}{2b^5\log^5(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2)*x^9,x]
```

```
[Out] (f^a*Gamma[5, -(b*x^2*Log[f])])/(2*b^5*Log[f]^5)
```

fricas [A] time = 0.40, size = 63, normalized size = 0.97

$$\frac{\left(b^{4} x^{8} \log\left(f\right)^{4} - 4 \, b^{3} x^{6} \log\left(f\right)^{3} + 12 \, b^{2} x^{4} \log\left(f\right)^{2} - 24 \, b x^{2} \log\left(f\right) + 24\right) f^{b x^{2} + a}}{2 \, b^{5} \log\left(f\right)^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^9,x, algorithm="fricas")
```

```
[Out] 1/2*(b^4*x^8*log(f)^4 - 4*b^3*x^6*log(f)^3 + 12*b^2*x^4*log(f)^2 - 24*b*x^2
*log(f) + 24)*f^(b*x^2 + a)/(b^5*log(f)^5)
```

giac [A] time = 0.40, size = 67, normalized size = 1.03

$$\frac{\left(b^{4} x^{8} \log\left(f\right)^{4} - 4 \, b^{3} x^{6} \log\left(f\right)^{3} + 12 \, b^{2} x^{4} \log\left(f\right)^{2} - 24 \, b x^{2} \log\left(f\right) + 24\right) e^{\left(b x^{2} \log\left(f\right) + a \log\left(f\right)\right)}}{2 \, b^{5} \log\left(f\right)^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^9,x, algorithm="giac")
```

```
[Out] 1/2*(b^4*x^8*log(f)^4 - 4*b^3*x^6*log(f)^3 + 12*b^2*x^4*log(f)^2 - 24*b*x^2
*log(f) + 24)*e^(b*x^2*log(f) + a*log(f))/(b^5*log(f)^5)
```

maple [A] time = 0.01, size = 64, normalized size = 0.98

$$\frac{\left(b^{4} x^{8} \ln\left(f\right)^{4}-4 b^{3} x^{6} \ln\left(f\right)^{3}+12 b^{2} x^{4} \ln\left(f\right)^{2}-24 b \,x^{2} \ln\left(f\right)+24\right) f^{b \,x^{2}+a}}{2 b^{5} \ln\left(f\right)^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)*x^9,x)
```

```
[Out] 1/2*f^(b*x^2+a)*(24-24*b*x^2*ln(f)+12*b^2*x^4*ln(f)^2-4*b^3*x^6*ln(f)^3+b^4
*x^8*ln(f)^4)/b^5/ln(f)^5
```

maxima [A] time = 0.44, size = 77, normalized size = 1.18

$$\frac{\left(b^{4} f^{a} x^{8} \log\left(f\right)^{4} - 4 \, b^{3} f^{a} x^{6} \log\left(f\right)^{3} + 12 \, b^{2} f^{a} x^{4} \log\left(f\right)^{2} - 24 \, b f^{a} x^{2} \log\left(f\right) + 24 \, f^{a}\right)} f^{b x^{2}}}{2 \, b^{5} \log\left(f\right)^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^9,x, algorithm="maxima")
```

```
[Out] 1/2*(b^4*f^a*x^8*log(f)^4 - 4*b^3*f^a*x^6*log(f)^3 + 12*b^2*f^a*x^4*log(f)^
2 - 24*b*f^a*x^2*log(f) + 24*f^a)*f^(b*x^2)/(b^5*log(f)^5)
```

mupad [B] time = 3.54, size = 63, normalized size = 0.97

$$\frac{f^{b\,x^2+a}\,\left(\frac{b^4\,x^8\,\ln(f)^4}{2}-2\,b^3\,x^6\,\ln(f)^3+6\,b^2\,x^4\,\ln(f)^2-12\,b\,x^2\,\ln(f)+12\right)}{b^5\,\ln(f)^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)*x^9,x)
```

```
[Out] (f^(a + b*x^2)*(6*b^2*x^4*log(f)^2 - 2*b^3*x^6*log(f)^3 + (b^4*x^8*log(f)^4
)/2 - 12*b*x^2*log(f) + 12))/(b^5*log(f)^5)
```

sympy [A] time = 0.15, size = 82, normalized size = 1.26

$$\begin{cases} \frac{f^{a+bx^2}\left(b^4x^8\log{(f)}^4-4b^3x^6\log{(f)}^3+12b^2x^4\log{(f)}^2-24bx^2\log{(f)}+24\right)}{2b^5\log{(f)}^5} & \text{for } 2b^5\log{(f)}^5\neq 0 \\ \frac{x^{10}}{10} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)*x**9,x)
```

```
[Out] Piecewise((f**(a + b*x**2)*(b**4*x**8*log(f)**4 - 4*b**3*x**6*log(f)**3 + 1
2*b**2*x**4*log(f)**2 - 24*b*x**2*log(f) + 24)/(2*b**5*log(f)**5), Ne(2*b**
5*log(f)**5, 0)), (x**10/10, True))
```

3.72 $\int f^{a+bx^2} x^7 \, dx$

Optimal. Leaf size=86

$$-\frac{3f^{a+bx^2}}{b^4\log^4(f)}+\frac{3x^2f^{a+bx^2}}{b^3\log^3(f)}-\frac{3x^4f^{a+bx^2}}{2b^2\log^2(f)}+\frac{x^6f^{a+bx^2}}{2b\log(f)}$$

```
[Out] -3*f^(b*x^2+a)/b^4/ln(f)^4+3*f^(b*x^2+a)*x^2/b^3/ln(f)^3-3/2*f^(b*x^2+a)*x^
4/b^2/ln(f)^2+1/2*f^(b*x^2+a)*x^6/b/ln(f)
```

Rubi [A] time = 0.09, antiderivative size = 86, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2212, 2209}

$$-\frac{3x^4f^{a+bx^2}}{2b^2\log^2(f)}+\frac{3x^2f^{a+bx^2}}{b^3\log^3(f)}-\frac{3f^{a+bx^2}}{b^4\log^4(f)}+\frac{x^6f^{a+bx^2}}{2b\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2)*x^7,x]
```

```
[Out] (-3*f^(a + b*x^2))/(b^4*Log[f]^4) + (3*f^(a + b*x^2)*x^2)/(b^3*Log[f]^3) -
(3*f^(a + b*x^2)*x^4)/(2*b^2*Log[f]^2) + (f^(a + b*x^2)*x^6)/(2*b*Log[f])
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int f^{a+bx^2}x^7\,dx = \frac{f^{a+bx^2}x^6}{2b\log(f)} - \frac{3\int f^{a+bx^2}x^5\,dx}{b\log(f)}$$
$$= -\frac{3f^{a+bx^2}x^4}{2b^2\log^2(f)} + \frac{f^{a+bx^2}x^6}{2b\log(f)} + \frac{6\int f^{a+bx^2}x^3\,dx}{b^2\log^2(f)}$$
$$= \frac{3f^{a+bx^2}x^2}{b^3\log^3(f)} - \frac{3f^{a+bx^2}x^4}{2b^2\log^2(f)} + \frac{f^{a+bx^2}x^6}{2b\log(f)} - \frac{6\int f^{a+bx^2}x\,dx}{b^3\log^3(f)}$$
$$= -\frac{3f^{a+bx^2}}{b^4\log^4(f)} + \frac{3f^{a+bx^2}x^2}{b^3\log^3(f)} - \frac{3f^{a+bx^2}x^4}{2b^2\log^2(f)} + \frac{f^{a+bx^2}x^6}{2b\log(f)}$$

Mathematica [**A**] time = 0.01, size = 53, normalized size = 0.62

$$\frac{f^{a+bx^2}\left(b^3x^6\log^3(f) - 3b^2x^4\log^2(f) + 6bx^2\log(f) - 6\right)}{2b^4\log^4(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2)*x^7,x]
```

```
[Out] (f^(a + b*x^2)*(-6 + 6*b*x^2*Log[f] - 3*b^2*x^4*Log[f]^2 + b^3*x^6*Log[f]^3
))/(2*b^4*Log[f]^4)
```

fricas [**A**] time = 0.41, size = 51, normalized size = 0.59

$$\frac{\left(b^3x^6\log(f)^3 - 3\,b^2x^4\log(f)^2 + 6\,bx^2\log(f) - 6\right)f^{bx^2+a}}{2\,b^4\log(f)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^7,x, algorithm="fricas")
```

```
[Out] 1/2*(b^3*x^6*log(f)^3 - 3*b^2*x^4*log(f)^2 + 6*b*x^2*log(f) - 6)*f^(b*x^2 +
 a)/(b^4*log(f)^4)
```

giac [**A**] time = 0.39, size = 55, normalized size = 0.64

$$\frac{\left(b^3x^6\log(f)^3 - 3\,b^2x^4\log(f)^2 + 6\,bx^2\log(f) - 6\right)e^{\left(bx^2\log(f)+a\log(f)\right)}}{2\,b^4\log(f)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^7,x, algorithm="giac")
```

```
[Out] 1/2*(b^3*x^6*log(f)^3 - 3*b^2*x^4*log(f)^2 + 6*b*x^2*log(f) - 6)*e^(b*x^2*l
og(f) + a*log(f))/(b^4*log(f)^4)
```

maple [A] time = 0.01, size = 52, normalized size = 0.60

$$\frac{\left(b^3 x^6 \ln(f)^3 - 3b^2 x^4 \ln(f)^2 + 6b\, x^2 \ln(f) - 6\right) f^{b\, x^2+a}}{2b^4 \ln(f)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)*x^7,x)
```

```
[Out] 1/2*(b^3*x^6*ln(f)^3-3*b^2*x^4*ln(f)^2+6*b*x^2*ln(f)-6)*f^(b*x^2+a)/ln(f)^4
/b^4
```

maxima [A] time = 0.45, size = 62, normalized size = 0.72

$$\frac{\left(b^3 f^a x^6 \log(f)^3 - 3\, b^2 f^a x^4 \log(f)^2 + 6\, b f^a x^2 \log(f) - 6\, f^a\right) f^{b x^2}}{2\, b^4 \log(f)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^7,x, algorithm="maxima")
```

```
[Out] 1/2*(b^3*f^a*x^6*log(f)^3 - 3*b^2*f^a*x^4*log(f)^2 + 6*b*f^a*x^2*log(f) - 6
*f^a)*f^(b*x^2)/(b^4*log(f)^4)
```

mupad [B] time = 3.50, size = 52, normalized size = 0.60

$$-\frac{f^{b\, x^2+a}\, \left(-\frac{b^3\, x^6\, {\ln(f)}^3}{2} + \frac{3\, b^2\, x^4\, {\ln(f)}^2}{2} - 3\, b\, x^2\, \ln(f) + 3\right)}{b^4\, {\ln(f)}^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)*x^7,x)
```

```
[Out] -(f^(a + b*x^2)*((3*b^2*x^4*log(f)^2)/2 - (b^3*x^6*log(f)^3)/2 - 3*b*x^2*lo
g(f) + 3))/(b^4*log(f)^4)
```

sympy [A] time = 0.14, size = 68, normalized size = 0.79

$$\begin{cases} \frac{f^{a+bx^2}\left(b^3x^6 \log{(f)}^3 - 3b^2x^4 \log{(f)}^2 + 6bx^2 \log{(f)} - 6\right)}{2b^4 \log{(f)}^4} & \text{for}\ 2b^4 \log{(f)}^4 \neq 0 \\ \frac{x^8}{8} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)*x**7,x)
```

```
[Out] Piecewise((f**(a + b*x**2)*(b**3*x**6*log(f)**3 - 3*b**2*x**4*log(f)**2 + 6
*b*x**2*log(f) - 6)/(2*b**4*log(f)**4), Ne(2*b**4*log(f)**4, 0)), (x**8/8,
True))
```

3.73 $\int f^{a+bx^2} x^5 \, dx$

Optimal. Leaf size=62

$$\frac{f^{a+bx^2}}{b^3\log^3(f)} - \frac{x^2 f^{a+bx^2}}{b^2\log^2(f)} + \frac{x^4 f^{a+bx^2}}{2b\log(f)}$$

```
[Out] f^(b*x^2+a)/b^3/ln(f)^3-f^(b*x^2+a)*x^2/b^2/ln(f)^2+1/2*f^(b*x^2+a)*x^4/b/l
n(f)
```

Rubi [A] time = 0.06, antiderivative size = 62, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2212, 2209}

$$-\frac{x^2 f^{a+bx^2}}{b^2\log^2(f)} + \frac{f^{a+bx^2}}{b^3\log^3(f)} + \frac{x^4 f^{a+bx^2}}{2b\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2)*x^5,x]
```

```
[Out] f^(a + b*x^2)/(b^3*Log[f]^3) - (f^(a + b*x^2)*x^2)/(b^2*Log[f]^2) + (f^(a +
 b*x^2)*x^4)/(2*b*Log[f])
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int f^{a+bx^2}x^5\,dx = \frac{f^{a+bx^2}x^4}{2b\log(f)} - \frac{2\int f^{a+bx^2}x^3\,dx}{b\log(f)}$$
$$= -\frac{f^{a+bx^2}x^2}{b^2\log^2(f)} + \frac{f^{a+bx^2}x^4}{2b\log(f)} + \frac{2\int f^{a+bx^2}x\,dx}{b^2\log^2(f)}$$
$$= \frac{f^{a+bx^2}}{b^3\log^3(f)} - \frac{f^{a+bx^2}x^2}{b^2\log^2(f)} + \frac{f^{a+bx^2}x^4}{2b\log(f)}$$

Mathematica [A] time = 0.01, size = 41, normalized size = 0.66

$$\frac{f^{a+bx^2}\left(b^2x^4\log^2(f) - 2bx^2\log(f) + 2\right)}{2b^3\log^3(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2)*x^5,x]
[Out] (f^(a + b*x^2)*(2 - 2*b*x^2*Log[f] + b^2*x^4*Log[f]^2))/(2*b^3*Log[f]^3)
```

fricas [A] time = 0.41, size = 39, normalized size = 0.63

$$\frac{\left(b^2x^4\log(f)^2 - 2\,bx^2\log(f) + 2\right)f^{bx^2+a}}{2\,b^3\log(f)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^5,x, algorithm="fricas")
[Out] 1/2*(b^2*x^4*log(f)^2 - 2*b*x^2*log(f) + 2)*f^(b*x^2 + a)/(b^3*log(f)^3)
```

giac [A] time = 0.40, size = 43, normalized size = 0.69

$$\frac{\left(b^2x^4\log(f)^2 - 2\,bx^2\log(f) + 2\right)e^{\left(bx^2\log(f) + a\log(f)\right)}}{2\,b^3\log(f)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^5,x, algorithm="giac")
[Out] 1/2*(b^2*x^4*log(f)^2 - 2*b*x^2*log(f) + 2)*e^(b*x^2*log(f) + a*log(f))/(b^
3*log(f)^3)
```

maple [A] time = 0.01, size = 40, normalized size = 0.65

$$\frac{\left(b^2x^4\ln(f)^2-2b\,x^2\ln(f)+2\right)f^{b\,x^2+a}}{2b^3\ln(f)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)*x^5,x)
```

```
[Out] 1/2*(b^2*x^4*ln(f)^2-2*b*x^2*ln(f)+2)*f^(b*x^2+a)/ln(f)^3/b^3
```

maxima [A] time = 0.44, size = 47, normalized size = 0.76

$$\frac{\left(b^2f^ax^4\log(f)^2-2\,bf^ax^2\log(f)+2\,f^a\right)f^{bx^2}}{2\,b^3\log(f)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^5,x, algorithm="maxima")
```

```
[Out] 1/2*(b^2*f^a*x^4*log(f)^2 - 2*b*f^a*x^2*log(f) + 2*f^a)*f^(b*x^2)/(b^3*log(
f)^3)
```

mupad [B] time = 3.51, size = 39, normalized size = 0.63

$$\frac{f^{b\,x^2+a}\,\left(\frac{b^2\,x^4\,{\ln(f)}^2}{2}-b\,x^2\,\ln(f)+1\right)}{b^3\,{\ln(f)}^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)*x^5,x)
```

```
[Out] (f^(a + b*x^2)*((b^2*x^4*log(f)^2)/2 - b*x^2*log(f) + 1))/(b^3*log(f)^3)
```

sympy [A] time = 0.13, size = 54, normalized size = 0.87

$$\begin{cases} \frac{f^{a+bx^2}\left(b^2x^4\log{(f)}^2-2bx^2\log{(f)}+2\right)}{2b^3\log{(f)}^3} & \text{for}\ 2b^3\log{(f)}^3\neq 0\\ \frac{x^6}{6} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)*x**5,x)
```

```
[Out] Piecewise((f**(a + b*x**2)*(b**2*x**4*log(f)**2 - 2*b*x**2*log(f) + 2)/(2*b
**3*log(f)**3), Ne(2*b**3*log(f)**3, 0)), (x**6/6, True))
```

3.74 $\int f^{a+bx^2} x^3 \, dx$

Optimal. Leaf size=44

$$\frac{x^2 f^{a+bx^2}}{2b\log(f)} - \frac{f^{a+bx^2}}{2b^2\log^2(f)}$$

```
[Out] -1/2*f^(b*x^2+a)/b^2/ln(f)^2+1/2*f^(b*x^2+a)*x^2/b/ln(f)
```

Rubi [A] time = 0.04, antiderivative size = 44, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2212, 2209}

$$\frac{x^2 f^{a+bx^2}}{2b\log(f)} - \frac{f^{a+bx^2}}{2b^2\log^2(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2)*x^3,x]
```

```
[Out] -f^(a + b*x^2)/(2*b^2*Log[f]^2) + (f^(a + b*x^2)*x^2)/(2*b*Log[f])
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int f^{a+bx^2}x^3\,dx = \frac{f^{a+bx^2}x^2}{2b\log(f)} - \frac{\int f^{a+bx^2}x\,dx}{b\log(f)}$$
$$= -\frac{f^{a+bx^2}}{2b^2\log^2(f)} + \frac{f^{a+bx^2}x^2}{2b\log(f)}$$

Mathematica [A]   time = 0.01, size = 29, normalized size = 0.66

$$\frac{f^{a+bx^2}\left(bx^2\log(f)-1\right)}{2b^2\log^2(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2)*x^3,x]
[Out] (f^(a + b*x^2)*(-1 + b*x^2*Log[f]))/(2*b^2*Log[f]^2)
```

fricas [A]   time = 0.43, size = 27, normalized size = 0.61

$$\frac{\left(bx^2\log(f)-1\right)f^{bx^2+a}}{2\,b^2\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^3,x, algorithm="fricas")
[Out] 1/2*(b*x^2*log(f) - 1)*f^(b*x^2 + a)/(b^2*log(f)^2)
```

giac [B]   time = 0.52, size = 690, normalized size = 15.68

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^3,x, algorithm="giac")
[Out] 1/2*(2*((pi*b*x^2*sgn(f) - pi*b*x^2)*(pi*b^2*log(abs(f))*sgn(f) - pi*b^2*lo
g(abs(f)))/((pi^2*b^2*sgn(f) - pi^2*b^2 + 2*b^2*log(abs(f))^2)^2 + 4*(pi*b^
2*log(abs(f))*sgn(f) - pi*b^2*log(abs(f)))^2) + (pi^2*b^2*sgn(f) - pi^2*b^2
 + 2*b^2*log(abs(f))^2)*(b*x^2*log(abs(f)) - 1)/((pi^2*b^2*sgn(f) - pi^2*b^
2 + 2*b^2*log(abs(f))^2)^2 + 4*(pi*b^2*log(abs(f))*sgn(f) - pi*b^2*log(abs(
f)))^2))*cos(-1/2*pi*b*x^2*sgn(f) + 1/2*pi*b*x^2 - 1/2*pi*a*sgn(f) + 1/2*pi
*a) + ((pi^2*b^2*sgn(f) - pi^2*b^2 + 2*b^2*log(abs(f))^2)*(pi*b*x^2*sgn(f)
```

```
- pi*b*x^2)/((pi^2*b^2*sgn(f) - pi^2*b^2 + 2*b^2*log(abs(f))^2)^2 + 4*(pi*b
^2*log(abs(f))*sgn(f) - pi*b^2*log(abs(f)))^2) - 4*(pi*b^2*log(abs(f))*sgn(
f) - pi*b^2*log(abs(f)))*(b*x^2*log(abs(f)) - 1)/((pi^2*b^2*sgn(f) - pi^2*b
^2 + 2*b^2*log(abs(f))^2)^2 + 4*(pi*b^2*log(abs(f))*sgn(f) - pi*b^2*log(abs
(f)))^2))*sin(-1/2*pi*b*x^2*sgn(f) + 1/2*pi*b*x^2 - 1/2*pi*a*sgn(f) + 1/2*p
i*a))*e^(b*x^2*log(abs(f)) + a*log(abs(f))) - 1/4*((2*b*i*x^2*log(abs(f)) -
 pi*b*x^2*sgn(f) + pi*b*x^2 - 2*i)*e^(1/2*(pi*b*x^2*(sgn(f) - 1) + pi*a*(sg
n(f) - 1))*i)/(2*pi*b^2*i*log(abs(f))*sgn(f) - 2*pi*b^2*i*log(abs(f)) + pi^
2*b^2*sgn(f) - pi^2*b^2 + 2*b^2*log(abs(f))^2) + (2*b*i*x^2*log(abs(f)) + p
i*b*x^2*sgn(f) - pi*b*x^2 - 2*i)*e^(-1/2*(pi*b*x^2*(sgn(f) - 1) + pi*a*(sgn
(f) - 1))*i)/(2*pi*b^2*i*log(abs(f))*sgn(f) - 2*pi*b^2*i*log(abs(f)) - pi^2
*b^2*sgn(f) + pi^2*b^2 - 2*b^2*log(abs(f))^2))*e^(b*x^2*log(abs(f)) + a*log
(abs(f)))/i
```

maple [A] time = 0.01, size = 28, normalized size = 0.64

$$\frac{\left(b\,x^{2} \ln\left(f\right)-1\right) f^{b\,x^{2}+a}}{2 b^{2} \ln\left(f\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)*x^3,x)
```

```
[Out] 1/2*(b*x^2*ln(f)-1)*f^(b*x^2+a)/b^2/ln(f)^2
```

maxima [A] time = 0.45, size = 32, normalized size = 0.73

$$\frac{\left(b f^{a} x^{2} \log\left(f\right) - f^{a}\right) f^{b x^{2}}}{2 \, b^{2} \log\left(f\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^3,x, algorithm="maxima")
```

```
[Out] 1/2*(b*f^a*x^2*log(f) - f^a)*f^(b*x^2)/(b^2*log(f)^2)
```

mupad [B] time = 3.46, size = 27, normalized size = 0.61

$$\frac{f^{b\,x^2+a}\,\left(\frac{b\,x^2\,\ln\left(f\right)}{2}-\frac{1}{2}\right)}{b^2\,{\ln\left(f\right)}^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)*x^3,x)
```

```
[Out] (f^(a + b*x^2)*((b*x^2*log(f))/2 - 1/2))/(b^2*log(f)^2)
```

sympy [A] time = 0.12, size = 41, normalized size = 0.93

$$\begin{cases} \frac{f^{a+bx^2}(bx^2\log(f)-1)}{2b^2\log(f)^2} & \text{for } 2b^2\log(f)^2 \neq 0 \\ \frac{x^4}{4} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)*x**3,x)
```

```
[Out] Piecewise((f**(a + b*x**2)*(b*x**2*log(f) - 1)/(2*b**2*log(f)**2), Ne(2*b**
2*log(f)**2, 0)), (x**4/4, True))
```

3.75 $\int f^{a+bx^2} x\,dx$

Optimal. Leaf size=20

$$\frac{f^{a+bx^2}}{2b\log(f)}$$

```
[Out] 1/2*f^(b*x^2+a)/b/ln(f)
```

Rubi [A] time = 0.01, antiderivative size = 20, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {2209}

$$\frac{f^{a+bx^2}}{2b\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2)*x,x]
```

```
[Out] f^(a + b*x^2)/(2*b*Log[f])
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+bx^2} x\,dx = \frac{f^{a+bx^2}}{2b\log(f)}$$

Mathematica [A] time = 0.00, size = 20, normalized size = 1.00

$$\frac{f^{a+bx^2}}{2b\log(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2)*x,x]
```

```
[Out] f^(a + b*x^2)/(2*b*Log[f])
```

fricas [A] time = 0.42, size = 18, normalized size = 0.90

$$\frac{f^{bx^2+a}}{2\,b\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x,x, algorithm="fricas")
[Out] 1/2*f^(b*x^2 + a)/(b*log(f))
```

giac [A] time = 0.39, size = 18, normalized size = 0.90

$$\frac{f^{bx^2+a}}{2\,b\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x,x, algorithm="giac")
[Out] 1/2*f^(b*x^2 + a)/(b*log(f))
```

maple [A] time = 0.01, size = 19, normalized size = 0.95

$$\frac{f^{b\,x^2+a}}{2b\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)*x,x)
[Out] 1/2*f^(b*x^2+a)/b/ln(f)
```

maxima [A] time = 0.45, size = 18, normalized size = 0.90

$$\frac{f^{bx^2+a}}{2\,b\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x,x, algorithm="maxima")
[Out] 1/2*f^(b*x^2 + a)/(b*log(f))
```

mupad [B] time = 3.30, size = 18, normalized size = 0.90

$$\frac{f^{b\,x^2+a}}{2\,b\,\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)*x,x)
```

```
[Out] f^(a + b*x^2)/(2*b*log(f))
```

sympy [A] time = 0.11, size = 24, normalized size = 1.20

$$\begin{cases} \frac{f^{a+bx^2}}{2b\log(f)} & \text{for } 2b\log(f) \neq 0 \\ \frac{x^2}{2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)*x,x)
```

```
[Out] Piecewise((f**(a + b*x**2)/(2*b*log(f)), Ne(2*b*log(f), 0)), (x**2/2, True)
)
```

3.76 $\int \frac{f^{a+bx^2}}{x} \, dx$

Optimal. Leaf size=15

$$\frac{1}{2} f^a \operatorname{Ei}\left(b x^2 \log(f)\right)$$

```
[Out] 1/2*f^a*Ei(b*x^2*ln(f))
```

Rubi [A] time = 0.02, antiderivative size = 15, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2210}

$$\frac{1}{2} f^a \operatorname{Ei}\left(b x^2 \log(f)\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2)/x,x]
```

```
[Out] (f^a*ExpIntegralEi[b*x^2*Log[f]])/2
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+bx^2}}{x} \, dx = \frac{1}{2} f^a \operatorname{Ei}\left(b x^2 \log(f)\right)$$

Mathematica [A] time = 0.00, size = 15, normalized size = 1.00

$$\frac{1}{2} f^a \operatorname{Ei}\left(b x^2 \log(f)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2)/x,x]
```

```
[Out] (f^a*ExpIntegralEi[b*x^2*Log[f]])/2
```

fricas [A] time = 0.40, size = 13, normalized size = 0.87

$$\frac{1}{2} f^a \mathrm{Ei}\left(bx^2 \log(f)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x,x, algorithm="fricas")
[Out] 1/2*f^a*Ei(b*x^2*log(f))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{bx^2+a}}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x,x, algorithm="giac")
[Out] integrate(f^(b*x^2 + a)/x, x)
```

maple [A] time = 0.03, size = 16, normalized size = 1.07

$$-\frac{f^a \,\mathrm{Ei}\left(1, -b\,x^2 \ln(f)\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)/x,x)
[Out] -1/2*f^a*Ei(1,-b*x^2*ln(f))
```

maxima [A] time = 0.62, size = 13, normalized size = 0.87

$$\frac{1}{2} f^a \mathrm{Ei}\left(bx^2 \log(f)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x,x, algorithm="maxima")
[Out] 1/2*f^a*Ei(b*x^2*log(f))
```

mupad [B] time = 3.18, size = 13, normalized size = 0.87

$$\frac{f^a \,\mathrm{ei}\left(b\,x^2\ \ln(f)\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)/x,x)
```

```
[Out] (f^a*ei(b*x^2*log(f)))/2
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+bx^2}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)/x,x)
```

```
[Out] Integral(f**(a + b*x**2)/x, x)
```

3.77 $\int \frac{f^{a+bx^2}}{x^3}\,dx$

Optimal. Leaf size=35

$$\frac{1}{2}bf^a\log(f)\text{Ei}\left(bx^2\log(f)\right)-\frac{f^{a+bx^2}}{2x^2}$$

```
[Out] -1/2*f^(b*x^2+a)/x^2+1/2*b*f^a*Ei(b*x^2*ln(f))*ln(f)
```

Rubi [A] time = 0.04, antiderivative size = 35, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2214, 2210}

$$\frac{1}{2}bf^a\log(f)\text{Ei}\left(bx^2\log(f)\right)-\frac{f^{a+bx^2}}{2x^2}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2)/x^3,x]
```

```
[Out] -f^(a + b*x^2)/(2*x^2) + (b*f^a*ExpIntegralEi[b*x^2*Log[f]]*Log[f])/2
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\begin{aligned}\int \frac{f^{a+bx^2}}{x^3}\,dx &= -\frac{f^{a+bx^2}}{2x^2}+(b\log(f))\int \frac{f^{a+bx^2}}{x}\,dx\\ &= -\frac{f^{a+bx^2}}{2x^2}+\frac{1}{2}bf^a\text{Ei}\left(bx^2\log(f)\right)\log(f)\end{aligned}$$

Mathematica [A] time = 0.01, size = 32, normalized size = 0.91

$$\frac{1}{2}f^a\left(b\log(f)\text{Ei}\left(bx^2\log(f)\right)-\frac{f^{bx^2}}{x^2}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2)/x^3,x]
```

```
[Out] (f^a*(-(f^(b*x^2)/x^2) + b*ExpIntegralEi[b*x^2*Log[f]]*Log[f]))/2
```

fricas [A] time = 0.41, size = 35, normalized size = 1.00

$$\frac{bf^ax^2\text{Ei}\left(bx^2\log(f)\right)\log(f)-f^{bx^2+a}}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^3,x, algorithm="fricas")
```

```
[Out] 1/2*(b*f^a*x^2*Ei(b*x^2*log(f))*log(f) - f^(b*x^2 + a))/x^2
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{f^{bx^2+a}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^3,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^2 + a)/x^3, x)
```

maple [A] time = 0.04, size = 35, normalized size = 1.00

$$-\frac{b\,f^a\,\text{Ei}\left(1,-b\,x^2\ln(f)\right)\ln(f)}{2}-\frac{f^a f^{b\,x^2}}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)/x^3,x)
```

```
[Out] -1/2*f^a/x^2*f^(b*x^2)-1/2*f^a*ln(f)*b*Ei(1,-b*x^2*ln(f))
```

maxima [A] time = 0.64, size = 18, normalized size = 0.51

$$\frac{1}{2}\,bf^a\Gamma\left(-1,-bx^2\log(f)\right)\log(f)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^3,x, algorithm="maxima")
```

```
[Out] 1/2*b*f^a*gamma(-1, -b*x^2*log(f))*log(f)
```

mupad [B] time = 3.43, size = 32, normalized size = 0.91

$$-\frac{f^a\,\left(f^{b\,x^2}+b\,x^2\,\ln(f)\,\mathrm{expint}\left(-b\,x^2\,\ln(f)\right)\right)}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)/x^3,x)
```

```
[Out] -(f^a*(f^(b*x^2) + b*x^2*log(f)*expint(-b*x^2*log(f))))/(2*x^2)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{f^{a+bx^2}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)/x**3,x)
```

```
[Out] Integral(f**(a + b*x**2)/x**3, x)
```

3.78 $\int \frac{f^{a+bx^2}}{x^5} dx$

Optimal. Leaf size=58

$$\frac{1}{4}b^2 f^a \log^2(f)\text{Ei}\left(bx^2\log(f)\right) - \frac{b\log(f)f^{a+bx^2}}{4x^2} - \frac{f^{a+bx^2}}{4x^4}$$

```
[Out] -1/4*f^(b*x^2+a)/x^4-1/4*b*f^(b*x^2+a)*ln(f)/x^2+1/4*b^2*f^a*Ei(b*x^2*ln(f)
)*ln(f)^2
```

Rubi [A] time = 0.07, antiderivative size = 58, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2214, 2210}

$$\frac{1}{4}b^2 f^a \log^2(f)\text{Ei}\left(bx^2\log(f)\right) - \frac{f^{a+bx^2}}{4x^4} - \frac{b\log(f)f^{a+bx^2}}{4x^2}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2)/x^5,x]
```

```
[Out] -f^(a + b*x^2)/(4*x^4) - (b*f^(a + b*x^2)*Log[f])/(4*x^2) + (b^2*f^a*ExpInt
egralEi[b*x^2*Log[f]]*Log[f]^2)/4
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\int \frac{f^{a+bx^2}}{x^5} dx = -\frac{f^{a+bx^2}}{4x^4} + \frac{1}{2}(b\log(f)) \int \frac{f^{a+bx^2}}{x^3} dx$$
$$= -\frac{f^{a+bx^2}}{4x^4} - \frac{bf^{a+bx^2}\log(f)}{4x^2} + \frac{1}{2}\left(b^2\log^2(f)\right) \int \frac{f^{a+bx^2}}{x} dx$$
$$= -\frac{f^{a+bx^2}}{4x^4} - \frac{bf^{a+bx^2}\log(f)}{4x^2} + \frac{1}{4}b^2 f^a \text{Ei}\left(bx^2\log(f)\right)\log^2(f)$$

Mathematica [A] time = 0.02, size = 48, normalized size = 0.83

$$\frac{f^a\left(b^2x^4\log^2(f)\text{Ei}\left(bx^2\log(f)\right) - f^{bx^2}\left(bx^2\log(f)+1\right)\right)}{4x^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2)/x^5,x]
```

```
[Out] (f^a*(b^2*x^4*ExpIntegralEi[b*x^2*Log[f]]*Log[f]^2 - f^(b*x^2)*(1 + b*x^2*L
og[f])))/(4*x^4)
```

fricas [A] time = 0.40, size = 48, normalized size = 0.83

$$\frac{b^2 f^a x^4 \text{Ei}\left(bx^2\log(f)\right)\log(f)^2 - \left(bx^2\log(f)+1\right)f^{bx^2+a}}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^5,x, algorithm="fricas")
```

```
[Out] 1/4*(b^2*f^a*x^4*Ei(b*x^2*log(f))*log(f)^2 - (b*x^2*log(f) + 1)*f^(b*x^2 +
a))/x^4
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{bx^2+a}}{x^5} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^5,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^2 + a)/x^5, x)
```

maple [A] time = 0.04, size = 57, normalized size = 0.98

$$-\frac{b^{2} f^{a} \operatorname{Ei}\left(1,-b\,x^{2}\ln(f)\right)\ln(f)^{2}}{4}-\frac{b\,f^{a} f^{b\,x^{2}}\ln(f)}{4x^{2}}-\frac{f^{a} f^{b\,x^{2}}}{4x^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)/x^5,x)
```

```
[Out] -1/4*f^a/x^4*f^(b*x^2)-1/4*f^a*ln(f)*b/x^2*f^(b*x^2)-1/4*f^a*ln(f)^2*b^2*Ei
(1,-b*x^2*ln(f))
```

maxima [A] time = 0.62, size = 22, normalized size = 0.38

$$-\frac{1}{2}\,b^{2} f^{a} \Gamma\left(-2,-bx^{2}\log(f)\right)\log(f)^{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^5,x, algorithm="maxima")
```

```
[Out] -1/2*b^2*f^a*gamma(-2, -b*x^2*log(f))*log(f)^2
```

mupad [B] time = 3.53, size = 57, normalized size = 0.98

$$-\frac{b^{2} f^{a} \ln(f)^{2} \left(f^{b\,x^{2}} \left(\frac{1}{2\,b\,x^{2}\ln(f)}+\frac{1}{2\,b^{2}\,x^{4}\ln(f)^{2}}\right)+\frac{\operatorname{expint}\left(-b\,x^{2}\ln(f)\right)}{2}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)/x^5,x)
```

```
[Out] -(b^2*f^a*log(f)^2*(f^(b*x^2)*(1/(2*b*x^2*log(f)) + 1/(2*b^2*x^4*log(f)^2))
 + expint(-b*x^2*log(f))/2))/2
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+bx^{2}}}{x^{5}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)/x**5,x)
```

```
[Out] Integral(f**(a + b*x**2)/x**5, x)
```

3.79 $\int \frac{f^{a+bx^2}}{x^7}\,dx$

Optimal. Leaf size=81

$$\frac{1}{12}b^3f^a\log^3(f)\text{Ei}\left(bx^2\log(f)\right)-\frac{b^2\log^2(f)f^{a+bx^2}}{12x^2}-\frac{f^{a+bx^2}}{6x^6}-\frac{b\log(f)f^{a+bx^2}}{12x^4}$$

```
[Out] -1/6*f^(b*x^2+a)/x^6-1/12*b*f^(b*x^2+a)*ln(f)/x^4-1/12*b^2*f^(b*x^2+a)*ln(f
)^2/x^2+1/12*b^3*f^a*Ei(b*x^2*ln(f))*ln(f)^3
```

Rubi [A] time = 0.09, antiderivative size = 81, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2214, 2210}

$$\frac{1}{12}b^3f^a\log^3(f)\text{Ei}\left(bx^2\log(f)\right)-\frac{b^2\log^2(f)f^{a+bx^2}}{12x^2}-\frac{f^{a+bx^2}}{6x^6}-\frac{b\log(f)f^{a+bx^2}}{12x^4}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2)/x^7,x]
```

```
[Out] -f^(a + b*x^2)/(6*x^6) - (b*f^(a + b*x^2)*Log[f])/(12*x^4) - (b^2*f^(a + b*
x^2)*Log[f]^2)/(12*x^2) + (b^3*f^a*ExpIntegralEi[b*x^2*Log[f]]*Log[f]^3)/12
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\begin{aligned}\int \frac{f^{a+bx^2}}{x^7}\,dx &= -\frac{f^{a+bx^2}}{6x^6}+\frac{1}{3}(b\log(f))\int \frac{f^{a+bx^2}}{x^5}\,dx\\ &= -\frac{f^{a+bx^2}}{6x^6}-\frac{bf^{a+bx^2}\log(f)}{12x^4}+\frac{1}{6}\left(b^2\log^2(f)\right)\int \frac{f^{a+bx^2}}{x^3}\,dx\\ &= -\frac{f^{a+bx^2}}{6x^6}-\frac{bf^{a+bx^2}\log(f)}{12x^4}-\frac{b^2f^{a+bx^2}\log^2(f)}{12x^2}+\frac{1}{6}\left(b^3\log^3(f)\right)\int \frac{f^{a+bx^2}}{x}\,dx\\ &= -\frac{f^{a+bx^2}}{6x^6}-\frac{bf^{a+bx^2}\log(f)}{12x^4}-\frac{b^2f^{a+bx^2}\log^2(f)}{12x^2}+\frac{1}{12}b^3f^a\text{Ei}\left(bx^2\log(f)\right)\log^3(f)\end{aligned}$$

Mathematica [A] time = 0.02, size = 59, normalized size = 0.73

$$\frac{f^a\left(b^3x^6\log^3(f)\text{Ei}\left(bx^2\log(f)\right)-f^{bx^2}\left(b^2x^4\log^2(f)+bx^2\log(f)+2\right)\right)}{12x^6}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2)/x^7,x]
```

```
[Out] (f^a*(b^3*x^6*ExpIntegralEi[b*x^2*Log[f]]*Log[f]^3 - f^(b*x^2)*(2 + b*x^2*L
og[f] + b^2*x^4*Log[f]^2)))/(12*x^6)
```

fricas [A] time = 0.42, size = 59, normalized size = 0.73

$$\frac{b^3f^ax^6\text{Ei}\left(bx^2\log(f)\right)\log(f)^3-\left(b^2x^4\log(f)^2+bx^2\log(f)+2\right)f^{bx^2+a}}{12\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^7,x, algorithm="fricas")
```

```
[Out] 1/12*(b^3*f^a*x^6*Ei(b*x^2*log(f))*log(f)^3 - (b^2*x^4*log(f)^2 + b*x^2*log
(f) + 2)*f^(b*x^2 + a))/x^6
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{bx^2+a}}{x^7}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^7,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^2 + a)/x^7, x)
```

maple [A] time = 0.05, size = 79, normalized size = 0.98

$$-\frac{b^{3} f^{a} \operatorname{Ei}\left(1,-b\,x^{2} \ln\left(f\right)\right) \ln\left(f\right)^{3}}{12}-\frac{b^{2} f^{a} f^{b\,x^{2}} \ln\left(f\right)^{2}}{12 x^{2}}-\frac{b\,f^{a} f^{b\,x^{2}} \ln\left(f\right)}{12 x^{4}}-\frac{f^{a} f^{b\,x^{2}}}{6 x^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)/x^7,x)
```

```
[Out] -1/6*f^a/x^6*f^(b*x^2)-1/12*f^a*ln(f)*b/x^4*f^(b*x^2)-1/12*f^a*ln(f)^2*b^2/
x^2*f^(b*x^2)-1/12*f^a*ln(f)^3*b^3*Ei(1,-b*x^2*ln(f))
```

maxima [A] time = 0.65, size = 22, normalized size = 0.27

$$\frac{1}{2}\,b^{3} f^{a} \Gamma\left(-3,-b x^{2} \log\left(f\right)\right) \log\left(f\right)^{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^7,x, algorithm="maxima")
```

```
[Out] 1/2*b^3*f^a*gamma(-3, -b*x^2*log(f))*log(f)^3
```

mupad [B] time = 3.54, size = 69, normalized size = 0.85

$$-\frac{b^{3}\,f^{a}\,\ln\left(f\right)^{3}\,\left(f^{b\,x^{2}}\,\left(\frac{1}{6\,b\,x^{2}\,\ln\left(f\right)}+\frac{1}{6\,b^{2}\,x^{4}\,\ln\left(f\right)^{2}}+\frac{1}{3\,b^{3}\,x^{6}\,\ln\left(f\right)^{3}}\right)+\frac{\mathrm{expint}\left(-b\,x^{2}\,\ln\left(f\right)\right)}{6}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)/x^7,x)
```

```
[Out] -(b^3*f^a*log(f)^3*(f^(b*x^2)*(1/(6*b*x^2*log(f)) + 1/(6*b^2*x^4*log(f)^2)
+ 1/(3*b^3*x^6*log(f)^3)) + expint(-b*x^2*log(f))/6))/2
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+bx^{2}}}{x^{7}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)/x**7,x)
```

```
[Out] Integral(f**(a + b*x**2)/x**7, x)
```

3.80 $\int \frac{f^{a+bx^2}}{x^9} \, dx$

Optimal. Leaf size=24

$$-\frac{1}{2}b^4 f^a \log^4(f)\Gamma\left(-4,-bx^2\log(f)\right)$$

```
[Out] -1/2*f^a/x^8*Ei(5,-b*x^2*ln(f))
```

Rubi [A] time = 0.02, antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2218}

$$-\frac{1}{2}b^4 f^a \log^4(f)\text{Gamma}\left(-4,-bx^2\log(f)\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2)/x^9,x]
```

```
[Out] -(b^4*f^a*Gamma[-4, -(b*x^2*Log[f])]*Log[f]^4)/2
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+bx^2}}{x^9} \, dx = -\frac{1}{2}b^4 f^a\Gamma\left(-4,-bx^2\log(f)\right)\log^4(f)$$

Mathematica [A] time = 0.00, size = 24, normalized size = 1.00

$$-\frac{1}{2}b^4 f^a \log^4(f)\Gamma\left(-4,-bx^2\log(f)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2)/x^9,x]
```

```
[Out] -1/2*(b^4*f^a*Gamma[-4, -(b*x^2*Log[f])]*Log[f]^4)
```

fricas [B] time = 0.41, size = 71, normalized size = 2.96

$$\frac{b^4 f^a x^8 \text{Ei}\left(bx^2 \log(f)\right) \log(f)^4 - \left(b^3 x^6 \log(f)^3 + b^2 x^4 \log(f)^2 + 2\,bx^2 \log(f) + 6\right) f^{bx^2+a}}{48\,x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^9,x, algorithm="fricas")
```

```
[Out] 1/48*(b^4*f^a*x^8*Ei(b*x^2*log(f))*log(f)^4 - (b^3*x^6*log(f)^3 + b^2*x^4*l
og(f)^2 + 2*b*x^2*log(f) + 6)*f^(b*x^2 + a))/x^8
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{bx^2+a}}{x^9}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^9,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^2 + a)/x^9, x)
```

maple [B] time = 0.07, size = 101, normalized size = 4.21

$$-\frac{b^4 f^a \,\text{Ei}\left(1, -b\,x^2 \ln(f)\right) \ln(f)^4}{48} - \frac{b^3 f^a f^{b\,x^2} \ln(f)^3}{48x^2} - \frac{b^2 f^a f^{b\,x^2} \ln(f)^2}{48x^4} - \frac{b\,f^a f^{b\,x^2} \ln(f)}{24x^6} - \frac{f^a f^{b\,x^2}}{8x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)/x^9,x)
```

```
[Out] -1/8*f^a/x^8*f^(b*x^2)-1/24*f^a*ln(f)*b/x^6*f^(b*x^2)-1/48*f^a*ln(f)^2*b^2/
x^4*f^(b*x^2)-1/48*f^a*ln(f)^3*b^3/x^2*f^(b*x^2)-1/48*f^a*ln(f)^4*b^4*Ei(1,
-b*x^2*ln(f))
```

maxima [B] time = 0.62, size = 22, normalized size = 0.92

$$-\frac{1}{2}\,b^4 f^a \Gamma\left(-4, -bx^2 \log(f)\right) \log(f)^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^9,x, algorithm="maxima")
```

```
[Out] -1/2*b^4*f^a*gamma(-4, -b*x^2*log(f))*log(f)^4
```

mupad [B] time = 3.57, size = 90, normalized size = 3.75

$$-\frac{b^4 f^a \ln(f)^4 \operatorname{expint}\left(-b x^2 \ln(f)\right)}{48}-\frac{b^4 f^a f^{b x^2} \ln(f)^4 \left(\frac{1}{24 b x^2 \ln(f)}+\frac{1}{24 b^2 x^4 \ln(f)^2}+\frac{1}{12 b^3 x^6 \ln(f)^3}+\frac{1}{4 b^4 x^8 \ln(f)^4}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)/x^9,x)
```

```
[Out] - (b^4*f^a*log(f)^4*expint(-b*x^2*log(f)))/48 - (b^4*f^a*f^(b*x^2)*log(f)^4
*(1/(24*b*x^2*log(f)) + 1/(24*b^2*x^4*log(f)^2) + 1/(12*b^3*x^6*log(f)^3) +
 1/(4*b^4*x^8*log(f)^4)))/2
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+bx^2}}{x^9}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)/x**9,x)
```

```
[Out] Integral(f**(a + b*x**2)/x**9, x)
```

3.81 $\int \frac{f^{a+bx^2}}{x^{11}} \, dx$

Optimal. Leaf size=24

$$\frac{1}{2}b^5 f^a \log^5(f)\Gamma\left(-5,-bx^2\log(f)\right)$$

```
[Out] -1/2*f^a/x^10*Ei(6,-b*x^2*ln(f))
```

Rubi [A] time = 0.02, antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2218}

$$\frac{1}{2}b^5 f^a \log^5(f)\text{Gamma}\left(-5,-bx^2\log(f)\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2)/x^11,x]
```

```
[Out] (b^5*f^a*Gamma[-5, -(b*x^2*Log[f])]*Log[f]^5)/2
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+bx^2}}{x^{11}} \, dx = \frac{1}{2}b^5 f^a\Gamma\left(-5,-bx^2\log(f)\right)\log^5(f)$$

Mathematica [A] time = 0.00, size = 24, normalized size = 1.00

$$\frac{1}{2}b^5 f^a \log^5(f)\Gamma\left(-5,-bx^2\log(f)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2)/x^11,x]
```

```
[Out] (b^5*f^a*Gamma[-5, -(b*x^2*Log[f])]*Log[f]^5)/2
```

fricas [B] time = 0.41, size = 83, normalized size = 3.46

$$\frac{b^5 f^a x^{10} \mathrm{Ei}\left(bx^2 \log(f)\right) \log(f)^5 - \left(b^4 x^8 \log(f)^4 + b^3 x^6 \log(f)^3 + 2\, b^2 x^4 \log(f)^2 + 6\, bx^2 \log(f) + 24\right) f^{bx^2+a}}{240\, x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^11,x, algorithm="fricas")
```

```
[Out] 1/240*(b^5*f^a*x^10*Ei(b*x^2*log(f))*log(f)^5 - (b^4*x^8*log(f)^4 + b^3*x^6
*log(f)^3 + 2*b^2*x^4*log(f)^2 + 6*b*x^2*log(f) + 24)*f^(b*x^2 + a))/x^10
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{bx^2+a}}{x^{11}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^11,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^2 + a)/x^11, x)
```

maple [B] time = 0.09, size = 123, normalized size = 5.12

$$-\frac{b^5 f^a \,\mathrm{Ei}\left(1, -b\, x^2 \ln(f)\right) \ln(f)^5}{240} - \frac{b^4 f^a f^{b\,x^2} \ln(f)^4}{240 x^2} - \frac{b^3 f^a f^{b\,x^2} \ln(f)^3}{240 x^4} - \frac{b^2 f^a f^{b\,x^2} \ln(f)^2}{120 x^6} - \frac{b\, f^a f^{b\,x^2} \ln(f)}{40 x^8} - \frac{f^a f^{b\,x^2}}{10 x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)/x^11,x)
```

```
[Out] -1/10*f^a/x^10*f^(b*x^2)-1/40*f^a*ln(f)*b/x^8*f^(b*x^2)-1/120*f^a*ln(f)^2*b
^2/x^6*f^(b*x^2)-1/240*f^a*ln(f)^3*b^3/x^4*f^(b*x^2)-1/240*f^a*ln(f)^4*b^4/
x^2*f^(b*x^2)-1/240*f^a*ln(f)^5*b^5*Ei(1,-b*x^2*ln(f))
```

maxima [B] time = 0.93, size = 22, normalized size = 0.92

$$\frac{1}{2}\, b^5 f^a \Gamma\left(-5, -bx^2 \log(f)\right) \log(f)^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^11,x, algorithm="maxima")
```

```
[Out] 1/2*b^5*f^a*gamma(-5, -b*x^2*log(f))*log(f)^5
```

mupad [B] time = 3.51, size = 102, normalized size = 4.25

$$-\frac{b^5 f^a \ln(f)^5 \operatorname{expint}\left(-b x^2 \ln(f)\right)}{240}-\frac{b^5 f^a f^{b x^2} \ln(f)^5 \left(\frac{1}{120 b x^2 \ln(f)}+\frac{1}{120 b^2 x^4 \ln(f)^2}+\frac{1}{60 b^3 x^6 \ln(f)^3}+\frac{1}{20 b^4 x^8 \ln(f)^4}+\frac{1}{5 b^5 x^{10} \ln(f)^5}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)/x^11,x)
```

```
[Out] - (b^5*f^a*log(f)^5*expint(-b*x^2*log(f)))/240 - (b^5*f^a*f^(b*x^2)*log(f)^
5*(1/(120*b*x^2*log(f)) + 1/(120*b^2*x^4*log(f)^2) + 1/(60*b^3*x^6*log(f)^3
) + 1/(20*b^4*x^8*log(f)^4) + 1/(5*b^5*x^10*log(f)^5)))/2
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+bx^2}}{x^{11}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)/x**11,x)
```

```
[Out] Integral(f**(a + b*x**2)/x**11, x)
```

3.82 $\int f^{a+bx^2} x^{12}\, dx$

Optimal. Leaf size=34

$$-\frac{x^{13} f^a \Gamma\left(\frac{13}{2}, -bx^2 \log(f)\right)}{2\left(-bx^2 \log(f)\right)^{13/2}}$$

```
[Out] -1/2*f^a*x^13*(524288/5621533568633696205238621875*GAMMA(51/2,-b*x^2*ln(f))
-524288/5621533568633696205238621875*(-b*x^2*ln(f))^(49/2)*exp(b*x^2*ln(f))
-262144/114725174870075432759971875*(-b*x^2*ln(f))^(47/2)*exp(b*x^2*ln(f))-
131072/2440961167448413462978125*(-b*x^2*ln(f))^(45/2)*exp(b*x^2*ln(f))-655
36/54243581498853632510625*(-b*x^2*ln(f))^(43/2)*exp(b*x^2*ln(f))-32768/126
1478639508224011875*(-b*x^2*ln(f))^(41/2)*exp(b*x^2*ln(f))-16384/3076777169
5322536875*(-b*x^2*ln(f))^(39/2)*exp(b*x^2*ln(f))-8192/788917222956988125*(
-b*x^2*ln(f))^(37/2)*exp(b*x^2*ln(f))-4096/21322087106945625*(-b*x^2*ln(f))
^(35/2)*exp(b*x^2*ln(f))-2048/609202488769875*(-b*x^2*ln(f))^(33/2)*exp(b*x
^2*ln(f))-1024/18460681477875*(-b*x^2*ln(f))^(31/2)*exp(b*x^2*ln(f))-512/59
5505854125*(-b*x^2*ln(f))^(29/2)*exp(b*x^2*ln(f))-256/20534684625*(-b*x^2*l
n(f))^(27/2)*exp(b*x^2*ln(f))-128/760543875*(-b*x^2*ln(f))^(25/2)*exp(b*x^2
*ln(f))-64/30421755*(-b*x^2*ln(f))^(23/2)*exp(b*x^2*ln(f))-32/1322685*(-b*x
^2*ln(f))^(21/2)*exp(b*x^2*ln(f))-16/62985*(-b*x^2*ln(f))^(19/2)*exp(b*x^2*
ln(f))-8/3315*(-b*x^2*ln(f))^(17/2)*exp(b*x^2*ln(f))-4/195*(-b*x^2*ln(f))^(
15/2)*exp(b*x^2*ln(f))-2/13*(-b*x^2*ln(f))^(13/2)*exp(b*x^2*ln(f)))/(-b*x^2
*ln(f))^(13/2)
```

Rubi [A] time = 0.02, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2218}

$$-\frac{x^{13} f^a \text{Gamma}\left(\frac{13}{2}, -bx^2 \log(f)\right)}{2\left(-bx^2 \log(f)\right)^{13/2}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2)*x^12,x]
```

```
[Out] -(f^a*x^13*Gamma[13/2, -(b*x^2*Log[f])])/(2*(-(b*x^2*Log[f]))^(13/2))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+bx^2}x^{12}\,dx = -\frac{f^a x^{13}\Gamma\left(\frac{13}{2}, -bx^2\log(f)\right)}{2\left(-bx^2\log(f)\right)^{13/2}}$$

Mathematica [A] time = 0.01, size = 34, normalized size = 1.00

$$-\frac{x^{13}f^a\Gamma\left(\frac{13}{2}, -bx^2\log(f)\right)}{2\left(-bx^2\log(f)\right)^{13/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2)*x^12,x]
```

```
[Out] -1/2*(f^a*x^13*Gamma[13/2, -(b*x^2*Log[f])])/(-(b*x^2*Log[f]))^(13/2)
```

fricas [A] time = 0.41, size = 113, normalized size = 3.32

$$-\frac{10395\,\sqrt{\pi}\,\sqrt{-b\log(f)}\,f^a\,\mathrm{erf}\left(\sqrt{-b\log(f)}\,x\right) - 2\left(32\,b^6x^{11}\log(f)^6 - 176\,b^5x^9\log(f)^5 + 792\,b^4x^7\log(f)^4 - 2772\right.}{128\,b^7\log(f)^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^12,x, algorithm="fricas")
```

```
[Out] -1/128*(10395*sqrt(pi)*sqrt(-b*log(f))*f^a*erf(sqrt(-b*log(f))*x) - 2*(32*b
^6*x^11*log(f)^6 - 176*b^5*x^9*log(f)^5 + 792*b^4*x^7*log(f)^4 - 2772*b^3*x
^5*log(f)^3 + 6930*b^2*x^3*log(f)^2 - 10395*b*x*log(f))*f^(b*x^2 + a))/(b^7
*log(f)^7)
```

giac [A] time = 0.31, size = 116, normalized size = 3.41

$$-\frac{10395\,\sqrt{\pi}\,f^a\,\mathrm{erf}\left(-\sqrt{-b\log(f)}\,x\right)}{128\,\sqrt{-b\log(f)}\,b^6\log(f)^6}+\frac{\left(32\,b^5x^{11}\log(f)^5 - 176\,b^4x^9\log(f)^4 + 792\,b^3x^7\log(f)^3 - 2772\,b^2x^5\log(f)^2\right.}{64\,b^6\log(f)^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^12,x, algorithm="giac")
```

```
[Out] -10395/128*sqrt(pi)*f^a*erf(-sqrt(-b*log(f))*x)/(sqrt(-b*log(f))*b^6*log(f)
^6) + 1/64*(32*b^5*x^11*log(f)^5 - 176*b^4*x^9*log(f)^4 + 792*b^3*x^7*log(f
```

```
)^3 - 2772*b^2*x^5*log(f)^2 + 6930*b*x^3*log(f) - 10395*x)*e^(b*x^2*log(f)
+ a*log(f))/(b^6*log(f)^6)
```

maple [A] time = 0.15, size = 164, normalized size = 4.82

$$\frac{x^{11} f^a f^{b x^2}}{2b\ln(f)}-\frac{11x^9 f^a f^{b x^2}}{4b^2\ln(f)^2}+\frac{99x^7 f^a f^{b x^2}}{8b^3\ln(f)^3}-\frac{693x^5 f^a f^{b x^2}}{16b^4\ln(f)^4}+\frac{3465x^3 f^a f^{b x^2}}{32b^5\ln(f)^5}-\frac{10395x f^a f^{b x^2}}{64b^6\ln(f)^6}+\frac{10395\sqrt{\pi}\, f^a \operatorname{erf}\left(\sqrt{-b\ln\right.}{128\sqrt{-b\ln(f)}\, b^6\ln(}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)*x^12,x)
```

```
[Out] 1/2*f^a*f^(b*x^2)*x^11/ln(f)/b-11/4*f^a/ln(f)^2/b^2*x^9*f^(b*x^2)+99/8*f^a/
ln(f)^3/b^3*x^7*f^(b*x^2)-693/16*f^a/ln(f)^4/b^4*x^5*f^(b*x^2)+3465/32*f^a/
ln(f)^5/b^5*x^3*f^(b*x^2)-10395/64*f^a/ln(f)^6/b^6*x*f^(b*x^2)+10395/128*f^
a/ln(f)^6/b^6*Pi^(1/2)/(-b*ln(f))^(1/2)*erf((-b*ln(f))^(1/2)*x)
```

maxima [A] time = 0.76, size = 127, normalized size = 3.74

$$\frac{\left(32\,b^5 f^a x^{11}\log(f)^5-176\,b^4 f^a x^9\log(f)^4+792\,b^3 f^a x^7\log(f)^3-2772\,b^2 f^a x^5\log(f)^2+6930\,b f^a x^3\log(f)-10\right.}{64\,b^6\log(f)^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^12,x, algorithm="maxima")
```

```
[Out] 1/64*(32*b^5*f^a*x^11*log(f)^5 - 176*b^4*f^a*x^9*log(f)^4 + 792*b^3*f^a*x^7
*log(f)^3 - 2772*b^2*f^a*x^5*log(f)^2 + 6930*b*f^a*x^3*log(f) - 10395*f^a*x
)*f^(b*x^2)/(b^6*log(f)^6) + 10395/128*sqrt(pi)*f^a*erf(sqrt(-b*log(f))*x)/
(sqrt(-b*log(f))*b^6*log(f)^6)
```

mupad [B] time = 3.63, size = 154, normalized size = 4.53

$$\frac{\frac{f^a\left(\frac{10395\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\,x\,\ln(f)}{\sqrt{b\,\ln(f)}}\right)}{128}-\frac{10395\,f^{b\,x^2}\,x\,\sqrt{b\,\ln(f)}}{64}\right)}{\sqrt{b\,\ln(f)}}-\frac{693\,b^2\,f^{b\,x^2+a}\,x^5\ln(f)^2}{16}+\frac{99\,b^3\,f^{b\,x^2+a}\,x^7\ln(f)^3}{8}-\frac{11\,b^4\,f^{b\,x^2+a}\,x^9\ln(f)^4}{4}+\frac{b^5\,f^{b\,x^2+a}\,x^{11}}{2}}{b^6\ln(f)^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)*x^12,x)
```

```
[Out] ((f^a*((10395*pi^(1/2)*erfi((b*x*log(f))/(b*log(f))^(1/2)))/128 - (10395*f^
(b*x^2)*x*(b*log(f))^(1/2))/64))/(b*log(f))^(1/2) - (693*b^2*f^(a + b*x^2)*
x^5*log(f)^2)/16 + (99*b^3*f^(a + b*x^2)*x^7*log(f)^3)/8 - (11*b^4*f^(a + b
```

```
*x^2)*x^9*log(f)^4)/4 + (b^5*f^(a + b*x^2)*x^11*log(f)^5)/2 + (3465*b*f^(a
+ b*x^2)*x^3*log(f))/32)/(b^6*log(f)^6)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+bx^2}x^{12}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)*x**12,x)
```

```
[Out] Integral(f**(a + b*x**2)*x**12, x)
```

3.83 $\int f^{a+bx^2} x^{10}\,dx$

Optimal. Leaf size=34

$$-\frac{x^{11} f^a \Gamma\left(\frac{11}{2},-b x^2 \log(f)\right)}{2\left(-b x^2 \log(f)\right)^{11/2}}$$

```
[Out] -1/2*f^a*x^11*(1048576/61836869254970658257624840625*GAMMA(51/2,-b*x^2*ln(f
))-1048576/61836869254970658257624840625*(-b*x^2*ln(f))^(49/2)*exp(b*x^2*ln
(f))-524288/1261976923570829760359690625*(-b*x^2*ln(f))^(47/2)*exp(b*x^2*ln
(f))-262144/26850572841932548092759375*(-b*x^2*ln(f))^(45/2)*exp(b*x^2*ln(f
))-131072/596679396487389957616875*(-b*x^2*ln(f))^(43/2)*exp(b*x^2*ln(f))-6
5536/13876265034590464130625*(-b*x^2*ln(f))^(41/2)*exp(b*x^2*ln(f))-32768/3
38445488648547905625*(-b*x^2*ln(f))^(39/2)*exp(b*x^2*ln(f))-16384/867808945
2526869375*(-b*x^2*ln(f))^(37/2)*exp(b*x^2*ln(f))-8192/234542958176401875*(
-b*x^2*ln(f))^(35/2)*exp(b*x^2*ln(f))-4096/6701227376468625*(-b*x^2*ln(f))^
(33/2)*exp(b*x^2*ln(f))-2048/203067496256625*(-b*x^2*ln(f))^(31/2)*exp(b*x^
2*ln(f))-1024/6550564395375*(-b*x^2*ln(f))^(29/2)*exp(b*x^2*ln(f))-512/2258
81530875*(-b*x^2*ln(f))^(27/2)*exp(b*x^2*ln(f))-256/8365982625*(-b*x^2*ln(f
))^(25/2)*exp(b*x^2*ln(f))-128/334639305*(-b*x^2*ln(f))^(23/2)*exp(b*x^2*ln
(f))-64/14549535*(-b*x^2*ln(f))^(21/2)*exp(b*x^2*ln(f))-32/692835*(-b*x^2*l
n(f))^(19/2)*exp(b*x^2*ln(f))-16/36465*(-b*x^2*ln(f))^(17/2)*exp(b*x^2*ln(f
))-8/2145*(-b*x^2*ln(f))^(15/2)*exp(b*x^2*ln(f))-4/143*(-b*x^2*ln(f))^(13/2
)*exp(b*x^2*ln(f))-2/11*(-b*x^2*ln(f))^(11/2)*exp(b*x^2*ln(f)))/(-b*x^2*ln(
f))^(11/2)
```

Rubi [A] time = 0.02, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2218}

$$-\frac{x^{11} f^a \text{Gamma}\left(\frac{11}{2},-b x^2 \log(f)\right)}{2\left(-b x^2 \log(f)\right)^{11/2}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2)*x^10,x]
```

```
[Out] -(f^a*x^11*Gamma[11/2, -(b*x^2*Log[f])])/(2*(-(b*x^2*Log[f]))^(11/2))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
```

```
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+bx^2} x^{10}\, dx = -\frac{f^a x^{11} \Gamma\left(\frac{11}{2}, -bx^2 \log(f)\right)}{2\left(-bx^2 \log(f)\right)^{11/2}}$$

Mathematica [A] time = 0.01, size = 34, normalized size = 1.00

$$-\frac{x^{11} f^a \Gamma\left(\frac{11}{2}, -bx^2 \log(f)\right)}{2\left(-bx^2 \log(f)\right)^{11/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2)*x^10,x]
[Out] -1/2*(f^a*x^11*Gamma[11/2, -(b*x^2*Log[f])])/(-(b*x^2*Log[f]))^(11/2)
```

fricas [A] time = 0.42, size = 101, normalized size = 2.97

$$\frac{945\sqrt{\pi}\sqrt{-b\log(f)}\, f^a \operatorname{erf}\left(\sqrt{-b\log(f)}\, x\right) + 2\left(16\, b^5 x^9 \log(f)^5 - 72\, b^4 x^7 \log(f)^4 + 252\, b^3 x^5 \log(f)^3 - 630\, b^2 x^3 \log(f)^2 + 945\, bx \log(f)\right) f^{bx^2+a}}{64\, b^6 \log(f)^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^10,x, algorithm="fricas")
[Out] 1/64*(945*sqrt(pi)*sqrt(-b*log(f))*f^a*erf(sqrt(-b*log(f))*x) + 2*(16*b^5*x
^9*log(f)^5 - 72*b^4*x^7*log(f)^4 + 252*b^3*x^5*log(f)^3 - 630*b^2*x^3*log(
f)^2 + 945*b*x*log(f))*f^(b*x^2 + a))/(b^6*log(f)^6)
```

giac [A] time = 0.33, size = 104, normalized size = 3.06

$$\frac{945\sqrt{\pi}\, f^a \operatorname{erf}\left(-\sqrt{-b\log(f)}\, x\right)}{64\sqrt{-b\log(f)}\, b^5 \log(f)^5} + \frac{\left(16\, b^4 x^9 \log(f)^4 - 72\, b^3 x^7 \log(f)^3 + 252\, b^2 x^5 \log(f)^2 - 630\, bx^3 \log(f) + 945\, x\right) \cdots}{32\, b^5 \log(f)^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^10,x, algorithm="giac")
```

```
[Out] 945/64*sqrt(pi)*f^a*erf(-sqrt(-b*log(f))*x)/(sqrt(-b*log(f))*b^5*log(f)^5)
+ 1/32*(16*b^4*x^9*log(f)^4 - 72*b^3*x^7*log(f)^3 + 252*b^2*x^5*log(f)^2 -
630*b*x^3*log(f) + 945*x)*e^(b*x^2*log(f) + a*log(f))/(b^5*log(f)^5)
```

maple [A] time = 0.08, size = 142, normalized size = 4.18

$$\frac{x^9 f^a f^{b\,x^2}}{2b\ln(f)}-\frac{9x^7 f^a f^{b\,x^2}}{4b^2\ln(f)^2}+\frac{63x^5 f^a f^{b\,x^2}}{8b^3\ln(f)^3}-\frac{315x^3 f^a f^{b\,x^2}}{16b^4\ln(f)^4}+\frac{945x\, f^a f^{b\,x^2}}{32b^5\ln(f)^5}-\frac{945\sqrt{\pi}\; f^a \operatorname{erf}\left(\sqrt{-b\ln(f)}\; x\right)}{64\sqrt{-b\ln(f)}\; b^5\ln(f)^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)*x^10,x)
```

```
[Out] 1/2*f^a/ln(f)/b*x^9*f^(b*x^2)-9/4*f^a/ln(f)^2/b^2*x^7*f^(b*x^2)+63/8*f^a/ln
(f)^3/b^3*x^5*f^(b*x^2)-315/16*f^a/ln(f)^4/b^4*x^3*f^(b*x^2)+945/32*f^a/ln(
f)^5/b^5*x*f^(b*x^2)-945/64*f^a/ln(f)^5/b^5*Pi^(1/2)/(-b*ln(f))^(1/2)*erf((
-b*ln(f))^(1/2)*x)
```

maxima [A] time = 0.75, size = 112, normalized size = 3.29

$$\frac{\left(16\,b^4 f^a x^9 \log(f)^4-72\,b^3 f^a x^7\log(f)^3+252\,b^2 f^a x^5\log(f)^2-630\,b f^a x^3\log(f)+945\,f^a x\right)f^{bx^2}}{32\,b^5\log(f)^5}-\frac{945\,\sqrt{\pi}\,f^a\,\mathrm{er}}{64\,\sqrt{-b\log}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^10,x, algorithm="maxima")
```

```
[Out] 1/32*(16*b^4*f^a*x^9*log(f)^4 - 72*b^3*f^a*x^7*log(f)^3 + 252*b^2*f^a*x^5*l
og(f)^2 - 630*b*f^a*x^3*log(f) + 945*f^a*x)*f^(b*x^2)/(b^5*log(f)^5) - 945/
64*sqrt(pi)*f^a*erf(sqrt(-b*log(f))*x)/(sqrt(-b*log(f))*b^5*log(f)^5)
```

mupad [B] time = 3.57, size = 139, normalized size = 4.09

$$-\frac{\frac{f^a\left(945\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\,x\,\ln(f)}{\sqrt{b\,\ln(f)}}\right)-1890\,f^{b\,x^2}\,x\,\sqrt{b\,\ln(f)}\right)}{64\,\sqrt{b\,\ln(f)}}-\frac{63\,b^2\,f^a\,f^{b\,x^2}\,x^5\ln(f)^2}{8}+\frac{9\,b^3\,f^a\,f^{b\,x^2}\,x^7\ln(f)^3}{4}-\frac{b^4\,f^a\,f^{b\,x^2}\,x^9\ln(f)^4}{2}+\frac{315\,b\,f^a\,f^{b\,x^2}\,x}{16}}{b^5\ln(f)^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)*x^10,x)
```

```
[Out] -((f^a*(945*pi^(1/2)*erfi((b*x*log(f))/(b*log(f))^(1/2)) - 1890*f^(b*x^2)*x
*(b*log(f))^(1/2)))/(64*(b*log(f))^(1/2)) - (63*b^2*f^a*f^(b*x^2)*x^5*log(f
)^2)/8 + (9*b^3*f^a*f^(b*x^2)*x^7*log(f)^3)/4 - (b^4*f^a*f^(b*x^2)*x^9*log(
f)^4)/2 + (315*b*f^a*f^(b*x^2)*x^3*log(f))/16)/(b^5*log(f)^5)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+bx^2}x^{10}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)*x**10,x)
```

```
[Out] Integral(f**(a + b*x**2)*x**10, x)
```

3.84 $\int f^{a+bx^2} x^8 \, dx$

Optimal. Leaf size=128

$$\frac{105\sqrt{\pi}\, f^a \text{erfi}\left(\sqrt{b}\, x\sqrt{\log(f)}\right)}{32b^{9/2}\log^{\frac{9}{2}}(f)}-\frac{105xf^{a+bx^2}}{16b^4\log^4(f)}+\frac{35x^3f^{a+bx^2}}{8b^3\log^3(f)}-\frac{7x^5f^{a+bx^2}}{4b^2\log^2(f)}+\frac{x^7f^{a+bx^2}}{2b\log(f)}$$

```
[Out] -105/16*f^(b*x^2+a)*x/b^4/ln(f)^4+35/8*f^(b*x^2+a)*x^3/b^3/ln(f)^3-7/4*f^(b
*x^2+a)*x^5/b^2/ln(f)^2+1/2*f^(b*x^2+a)*x^7/b/ln(f)+105/32*f^a*erfi(x*b^(1/
2)*ln(f)^(1/2))*Pi^(1/2)/b^(9/2)/ln(f)^(9/2)
```

Rubi [A] time = 0.14, antiderivative size = 128, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2212, 2204}

$$\frac{105\sqrt{\pi}\, f^a \text{Erfi}\left(\sqrt{b}\, x\sqrt{\log(f)}\right)}{32b^{9/2}\log^{\frac{9}{2}}(f)}-\frac{7x^5f^{a+bx^2}}{4b^2\log^2(f)}+\frac{35x^3f^{a+bx^2}}{8b^3\log^3(f)}-\frac{105xf^{a+bx^2}}{16b^4\log^4(f)}+\frac{x^7f^{a+bx^2}}{2b\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2)*x^8,x]
```

```
[Out] (105*f^a*Sqrt[Pi]*Erfi[Sqrt[b]*x*Sqrt[Log[f]]])/(32*b^(9/2)*Log[f]^(9/2)) -
 (105*f^(a + b*x^2)*x)/(16*b^4*Log[f]^4) + (35*f^(a + b*x^2)*x^3)/(8*b^3*Lo
g[f]^3) - (7*f^(a + b*x^2)*x^5)/(4*b^2*Log[f]^2) + (f^(a + b*x^2)*x^7)/(2*b
*Log[f])
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int f^{a+bx^2}x^8\,dx = \frac{f^{a+bx^2}x^7}{2b\log(f)} - \frac{7\int f^{a+bx^2}x^6\,dx}{2b\log(f)}$$
$$= -\frac{7f^{a+bx^2}x^5}{4b^2\log^2(f)} + \frac{f^{a+bx^2}x^7}{2b\log(f)} + \frac{35\int f^{a+bx^2}x^4\,dx}{4b^2\log^2(f)}$$
$$= \frac{35f^{a+bx^2}x^3}{8b^3\log^3(f)} - \frac{7f^{a+bx^2}x^5}{4b^2\log^2(f)} + \frac{f^{a+bx^2}x^7}{2b\log(f)} - \frac{105\int f^{a+bx^2}x^2\,dx}{8b^3\log^3(f)}$$
$$= -\frac{105f^{a+bx^2}x}{16b^4\log^4(f)} + \frac{35f^{a+bx^2}x^3}{8b^3\log^3(f)} - \frac{7f^{a+bx^2}x^5}{4b^2\log^2(f)} + \frac{f^{a+bx^2}x^7}{2b\log(f)} + \frac{105\int f^{a+bx^2}\,dx}{16b^4\log^4(f)}$$
$$= \frac{105f^a\sqrt{\pi}\,\text{erfi}\left(\sqrt{b}\,x\sqrt{\log(f)}\right)}{32b^{9/2}\log^{\frac{9}{2}}(f)} - \frac{105f^{a+bx^2}x}{16b^4\log^4(f)} + \frac{35f^{a+bx^2}x^3}{8b^3\log^3(f)} - \frac{7f^{a+bx^2}x^5}{4b^2\log^2(f)} + \frac{f^{a+bx^2}x^7}{2b\log(f)}$$

Mathematica [A] time = 0.04, size = 95, normalized size = 0.74

$$\frac{f^a\left(2\sqrt{b}\,x\sqrt{\log(f)}\,f^{bx^2}\left(8b^3x^6\log^3(f) - 28b^2x^4\log^2(f) + 70bx^2\log(f) - 105\right) + 105\sqrt{\pi}\,\text{erfi}\left(\sqrt{b}\,x\sqrt{\log(f)}\right)\right)}{32b^{9/2}\log^{\frac{9}{2}}(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2)*x^8,x]
```

```
[Out] (f^a*(105*Sqrt[Pi]*Erfi[Sqrt[b]*x*Sqrt[Log[f]]] + 2*Sqrt[b]*f^(b*x^2)*x*Sqr
t[Log[f]]*(-105 + 70*b*x^2*Log[f] - 28*b^2*x^4*Log[f]^2 + 8*b^3*x^6*Log[f]^
3)))/(32*b^(9/2)*Log[f]^(9/2))
```

fricas [A] time = 0.42, size = 89, normalized size = 0.70

$$-\frac{105\,\sqrt{\pi}\,\sqrt{-b\log(f)}\,f^a\,\text{erf}\left(\sqrt{-b\log(f)}\,x\right) - 2\left(8\,b^4x^7\log(f)^4 - 28\,b^3x^5\log(f)^3 + 70\,b^2x^3\log(f)^2 - 105\,bx\log(\right.}{32\,b^5\log(f)^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^8,x, algorithm="fricas")
```

```
[Out] -1/32*(105*sqrt(pi)*sqrt(-b*log(f))*f^a*erf(sqrt(-b*log(f))*x) - 2*(8*b^4*x
^7*log(f)^4 - 28*b^3*x^5*log(f)^3 + 70*b^2*x^3*log(f)^2 - 105*b*x*log(f))*f
^(b*x^2 + a))/(b^5*log(f)^5)
```

giac [A] time = 0.35, size = 92, normalized size = 0.72

$$-\frac{105\,\sqrt{\pi}f^{a}\operatorname{erf}\left(-\sqrt{-b\log\left(f\right)}x\right)}{32\,\sqrt{-b\log\left(f\right)}b^{4}\log\left(f\right)^{4}}+\frac{\left(8\,b^{3}x^{7}\log\left(f\right)^{3}-28\,b^{2}x^{5}\log\left(f\right)^{2}+70\,bx^{3}\log\left(f\right)-105\,x\right)e^{\left(bx^{2}\log\left(f\right)+a\log\left(f\right)\right)}}{16\,b^{4}\log\left(f\right)^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^8,x, algorithm="giac")
```

```
[Out] -105/32*sqrt(pi)*f^a*erf(-sqrt(-b*log(f))*x)/(sqrt(-b*log(f))*b^4*log(f)^4)
 + 1/16*(8*b^3*x^7*log(f)^3 - 28*b^2*x^5*log(f)^2 + 70*b*x^3*log(f) - 105*x
)*e^(b*x^2*log(f) + a*log(f))/(b^4*log(f)^4)
```

maple [A] time = 0.06, size = 120, normalized size = 0.94

$$\frac{x^{7}f^{a}f^{b\,x^{2}}}{2b\ln\left(f\right)}-\frac{7x^{5}f^{a}f^{b\,x^{2}}}{4b^{2}\ln\left(f\right)^{2}}+\frac{35x^{3}f^{a}f^{b\,x^{2}}}{8b^{3}\ln\left(f\right)^{3}}-\frac{105x\,f^{a}f^{b\,x^{2}}}{16b^{4}\ln\left(f\right)^{4}}+\frac{105\sqrt{\pi}\;f^{a}\operatorname{erf}\left(\sqrt{-b\ln\left(f\right)}\;x\right)}{32\sqrt{-b\ln\left(f\right)}\;b^{4}\ln\left(f\right)^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)*x^8,x)
```

```
[Out] 1/2*f^a/ln(f)/b*x^7*f^(b*x^2)-7/4*f^a/ln(f)^2/b^2*x^5*f^(b*x^2)+35/8*f^a/ln
(f)^3/b^3*x^3*f^(b*x^2)-105/16*f^a/ln(f)^4/b^4*x*f^(b*x^2)+105/32*f^a/ln(f)
^4/b^4*Pi^(1/2)/(-b*ln(f))^(1/2)*erf((-b*ln(f))^(1/2)*x)
```

maxima [A] time = 0.67, size = 97, normalized size = 0.76

$$\frac{\left(8\,b^{3}f^{a}x^{7}\log\left(f\right)^{3}-28\,b^{2}f^{a}x^{5}\log\left(f\right)^{2}+70\,bf^{a}x^{3}\log\left(f\right)-105\,f^{a}x\right)f^{bx^{2}}}{16\,b^{4}\log\left(f\right)^{4}}+\frac{105\,\sqrt{\pi}f^{a}\operatorname{erf}\left(\sqrt{-b\log\left(f\right)}x\right)}{32\,\sqrt{-b\log\left(f\right)}b^{4}\log\left(f\right)^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^8,x, algorithm="maxima")
```

```
[Out] 1/16*(8*b^3*f^a*x^7*log(f)^3 - 28*b^2*f^a*x^5*log(f)^2 + 70*b*f^a*x^3*log(f
) - 105*f^a*x)*f^(b*x^2)/(b^4*log(f)^4) + 105/32*sqrt(pi)*f^a*erf(sqrt(-b*l
og(f))*x)/(sqrt(-b*log(f))*b^4*log(f)^4)
```

mupad [B] time = 3.55, size = 116, normalized size = 0.91

$$\frac{\frac{f^{a}\left(105\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b\,x\,\ln\left(f\right)}{\sqrt{b\,\ln\left(f\right)}}\right)-210\,f^{b\,x^{2}}\,x\,\sqrt{b\,\ln\left(f\right)}\right)}{32\,\sqrt{b\,\ln\left(f\right)}}-\frac{7\,b^{2}\,f^{a}\,f^{b\,x^{2}}\,x^{5}\,\ln\left(f\right)^{2}}{4}+\frac{b^{3}\,f^{a}\,f^{b\,x^{2}}\,x^{7}\,\ln\left(f\right)^{3}}{2}+\frac{35\,b\,f^{a}\,f^{b\,x^{2}}\,x^{3}\,\ln\left(f\right)}{8}}{b^{4}\,{\ln\left(f\right)}^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)*x^8,x)
```

```
[Out] ((f^a*(105*pi^(1/2)*erfi((b*x*log(f))/(b*log(f))^(1/2)) - 210*f^(b*x^2)*x*(
b*log(f))^(1/2)))/(32*(b*log(f))^(1/2)) - (7*b^2*f^a*f^(b*x^2)*x^5*log(f)^2
)/4 + (b^3*f^a*f^(b*x^2)*x^7*log(f)^3)/2 + (35*b*f^a*f^(b*x^2)*x^3*log(f))/
8)/(b^4*log(f)^4)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+bx^2}x^8\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)*x**8,x)
```

```
[Out] Integral(f**(a + b*x**2)*x**8, x)
```

3.85 $\int f^{a+bx^2} x^6 \, dx$

Optimal. Leaf size=105

$$-\frac{15\sqrt{\pi}\, f^a \operatorname{erfi}\left(\sqrt{b}\, x\sqrt{\log(f)}\right)}{16b^{7/2}\log^{\frac{7}{2}}(f)}+\frac{15x f^{a+bx^2}}{8b^3\log^3(f)}-\frac{5x^3 f^{a+bx^2}}{4b^2\log^2(f)}+\frac{x^5 f^{a+bx^2}}{2b\log(f)}$$

```
[Out] 15/8*f^(b*x^2+a)*x/b^3/ln(f)^3-5/4*f^(b*x^2+a)*x^3/b^2/ln(f)^2+1/2*f^(b*x^2
+a)*x^5/b/ln(f)-15/16*f^a*erfi(x*b^(1/2)*ln(f)^(1/2))*Pi^(1/2)/b^(7/2)/ln(f
)^(7/2)
```

Rubi [A] time = 0.09, antiderivative size = 105, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2212, 2204}

$$-\frac{15\sqrt{\pi}\, f^a \text{Erfi}\left(\sqrt{b}\, x\sqrt{\log(f)}\right)}{16b^{7/2}\log^{\frac{7}{2}}(f)}-\frac{5x^3 f^{a+bx^2}}{4b^2\log^2(f)}+\frac{15x f^{a+bx^2}}{8b^3\log^3(f)}+\frac{x^5 f^{a+bx^2}}{2b\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2)*x^6,x]
```

```
[Out] (-15*f^a*Sqrt[Pi]*Erfi[Sqrt[b]*x*Sqrt[Log[f]]])/(16*b^(7/2)*Log[f]^(7/2)) +
 (15*f^(a + b*x^2)*x)/(8*b^3*Log[f]^3) - (5*f^(a + b*x^2)*x^3)/(4*b^2*Log[f
]^2) + (f^(a + b*x^2)*x^5)/(2*b*Log[f])
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int f^{a+bx^2}x^6\,dx=\frac{f^{a+bx^2}x^5}{2b\log(f)}-\frac{5\int f^{a+bx^2}x^4\,dx}{2b\log(f)}$$
$$=-\frac{5f^{a+bx^2}x^3}{4b^2\log^2(f)}+\frac{f^{a+bx^2}x^5}{2b\log(f)}+\frac{15\int f^{a+bx^2}x^2\,dx}{4b^2\log^2(f)}$$
$$=\frac{15f^{a+bx^2}x}{8b^3\log^3(f)}-\frac{5f^{a+bx^2}x^3}{4b^2\log^2(f)}+\frac{f^{a+bx^2}x^5}{2b\log(f)}-\frac{15\int f^{a+bx^2}\,dx}{8b^3\log^3(f)}$$
$$=-\frac{15f^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,x\sqrt{\log(f)}\right)}{16b^{7/2}\log^{\frac{7}{2}}(f)}+\frac{15f^{a+bx^2}x}{8b^3\log^3(f)}-\frac{5f^{a+bx^2}x^3}{4b^2\log^2(f)}+\frac{f^{a+bx^2}x^5}{2b\log(f)}$$

Mathematica [**A**] time = 0.04, size = 83, normalized size = 0.79

$$\frac{f^a\left(2\sqrt{b}\,x\sqrt{\log(f)}\,f^{bx^2}\left(4b^2x^4\log^2(f)-10bx^2\log(f)+15\right)-15\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,x\sqrt{\log(f)}\right)\right)}{16b^{7/2}\log^{\frac{7}{2}}(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2)*x^6,x]
```

```
[Out] (f^a*(-15*Sqrt[Pi]*Erfi[Sqrt[b]*x*Sqrt[Log[f]]] + 2*Sqrt[b]*f^(b*x^2)*x*Sqr
t[Log[f]]*(15 - 10*b*x^2*Log[f] + 4*b^2*x^4*Log[f]^2)))/(16*b^(7/2)*Log[f]^
(7/2))
```

fricas [**A**] time = 0.42, size = 77, normalized size = 0.73

$$\frac{15\sqrt{\pi}\sqrt{-b\log(f)}\,f^a\,\mathrm{erf}\left(\sqrt{-b\log(f)}\,x\right)+2\left(4\,b^3x^5\log(f)^3-10\,b^2x^3\log(f)^2+15\,bx\log(f)\right)f^{bx^2+a}}{16\,b^4\log(f)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^6,x, algorithm="fricas")
```

```
[Out] 1/16*(15*sqrt(pi)*sqrt(-b*log(f))*f^a*erf(sqrt(-b*log(f))*x) + 2*(4*b^3*x^5
*log(f)^3 - 10*b^2*x^3*log(f)^2 + 15*b*x*log(f))*f^(b*x^2 + a))/(b^4*log(f)
^4)
```

giac [**A**] time = 0.35, size = 80, normalized size = 0.76

$$\frac{15\sqrt{\pi}\,f^a\,\mathrm{erf}\left(-\sqrt{-b\log(f)}\,x\right)}{16\sqrt{-b\log(f)}\,b^3\log(f)^3}+\frac{\left(4\,b^2x^5\log(f)^2-10\,bx^3\log(f)+15\,x\right)e^{\left(bx^2\log(f)+a\log(f)\right)}}{8\,b^3\log(f)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^6,x, algorithm="giac")
```

```
[Out] 15/16*sqrt(pi)*f^a*erf(-sqrt(-b*log(f))*x)/(sqrt(-b*log(f))*b^3*log(f)^3) +
 1/8*(4*b^2*x^5*log(f)^2 - 10*b*x^3*log(f) + 15*x)*e^(b*x^2*log(f) + a*log(
f))/(b^3*log(f)^3)
```

maple [A] time = 0.05, size = 98, normalized size = 0.93

$$\frac{x^5 f^a f^{b x^2}}{2b\ln(f)}-\frac{5x^3 f^a f^{b x^2}}{4b^2\ln(f)^2}+\frac{15x\, f^a f^{b x^2}}{8b^3\ln(f)^3}-\frac{15\sqrt{\pi}\; f^a \operatorname{erf}\left(\sqrt{-b\ln(f)}\; x\right)}{16\sqrt{-b\ln(f)}\; b^3\ln(f)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)*x^6,x)
```

```
[Out] 1/2*f^a/ln(f)/b*x^5*f^(b*x^2)-5/4*f^a/ln(f)^2/b^2*x^3*f^(b*x^2)+15/8*f^a/ln
(f)^3/b^3*x*f^(b*x^2)-15/16*f^a/ln(f)^3/b^3*Pi^(1/2)/(-b*ln(f))^(1/2)*erf((
-b*ln(f))^(1/2)*x)
```

maxima [A] time = 0.63, size = 82, normalized size = 0.78

$$\frac{\left(4\,b^2 f^a x^5\log(f)^2-10\,b f^a x^3\log(f)+15\,f^a x\right)f^{bx^2}}{8\,b^3\log(f)^3}-\frac{15\,\sqrt{\pi}\,f^a\operatorname{erf}\left(\sqrt{-b\log(f)}\,x\right)}{16\,\sqrt{-b\log(f)}\,b^3\log(f)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^6,x, algorithm="maxima")
```

```
[Out] 1/8*(4*b^2*f^a*x^5*log(f)^2 - 10*b*f^a*x^3*log(f) + 15*f^a*x)*f^(b*x^2)/(b^
3*log(f)^3) - 15/16*sqrt(pi)*f^a*erf(sqrt(-b*log(f))*x)/(sqrt(-b*log(f))*b^
3*log(f)^3)
```

mupad [B] time = 3.52, size = 98, normalized size = 0.93

$$\frac{15\,f^a\,f^{b\,x^2}\,x}{8\,b^3\,{\ln(f)}^3}+\frac{f^a\,f^{b\,x^2}\,x^5}{2\,b\,\ln(f)}-\frac{5\,f^a\,f^{b\,x^2}\,x^3}{4\,b^2\,{\ln(f)}^2}-\frac{15\,f^a\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b\,x\,\ln(f)}{\sqrt{b\,\ln(f)}}\right)}{16\,b^3\,{\ln(f)}^3\,\sqrt{b\,\ln(f)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)*x^6,x)
```

```
[Out] (15*f^a*f^(b*x^2)*x)/(8*b^3*log(f)^3) + (f^a*f^(b*x^2)*x^5)/(2*b*log(f)) -
(5*f^a*f^(b*x^2)*x^3)/(4*b^2*log(f)^2) - (15*f^a*pi^(1/2)*erfi((b*x*log(f))
/(b*log(f))^(1/2)))/(16*b^3*log(f)^3*(b*log(f))^(1/2))
```

<u>**sympy**</u> **[F]** time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+bx^2}x^6\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)*x**6,x)
```

```
[Out] Integral(f**(a + b*x**2)*x**6, x)
```

3.86 $\int f^{a+bx^2} x^4\, dx$

Optimal. Leaf size=82

$$\frac{3\sqrt{\pi}\, f^a \operatorname{erfi}\left(\sqrt{b}\, x\sqrt{\log(f)}\right)}{8b^{5/2}\log^{\frac{5}{2}}(f)}-\frac{3xf^{a+bx^2}}{4b^2\log^2(f)}+\frac{x^3f^{a+bx^2}}{2b\log(f)}$$

```
[Out] -3/4*f^(b*x^2+a)*x/b^2/ln(f)^2+1/2*f^(b*x^2+a)*x^3/b/ln(f)+3/8*f^a*erfi(x*b
^(1/2)*ln(f)^(1/2))*Pi^(1/2)/b^(5/2)/ln(f)^(5/2)
```

Rubi [A] time = 0.06, antiderivative size = 82, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2212, 2204}

$$\frac{3\sqrt{\pi}\, f^a \operatorname{Erfi}\left(\sqrt{b}\, x\sqrt{\log(f)}\right)}{8b^{5/2}\log^{\frac{5}{2}}(f)}-\frac{3xf^{a+bx^2}}{4b^2\log^2(f)}+\frac{x^3f^{a+bx^2}}{2b\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2)*x^4,x]
```

```
[Out] (3*f^a*Sqrt[Pi]*Erfi[Sqrt[b]*x*Sqrt[Log[f]]])/(8*b^(5/2)*Log[f]^(5/2)) - (3
*f^(a + b*x^2)*x)/(4*b^2*Log[f]^2) + (f^(a + b*x^2)*x^3)/(2*b*Log[f])
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int f^{a+bx^2}x^4\,dx = \frac{f^{a+bx^2}x^3}{2b\log(f)} - \frac{3\int f^{a+bx^2}x^2\,dx}{2b\log(f)}$$
$$= -\frac{3f^{a+bx^2}x}{4b^2\log^2(f)} + \frac{f^{a+bx^2}x^3}{2b\log(f)} + \frac{3\int f^{a+bx^2}\,dx}{4b^2\log^2(f)}$$
$$= \frac{3f^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,x\sqrt{\log(f)}\right)}{8b^{5/2}\log^{\frac{5}{2}}(f)} - \frac{3f^{a+bx^2}x}{4b^2\log^2(f)} + \frac{f^{a+bx^2}x^3}{2b\log(f)}$$

Mathematica [A] time = 0.03, size = 71, normalized size = 0.87

$$\frac{f^a\left(3\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,x\sqrt{\log(f)}\right) + 2\sqrt{b}\,x\sqrt{\log(f)}\,f^{bx^2}\left(2bx^2\log(f) - 3\right)\right)}{8b^{5/2}\log^{\frac{5}{2}}(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2)*x^4,x]
```

```
[Out] (f^a*(3*Sqrt[Pi]*Erfi[Sqrt[b]*x*Sqrt[Log[f]]] + 2*Sqrt[b]*f^(b*x^2)*x*Sqrt[
Log[f]]*(-3 + 2*b*x^2*Log[f])))/(8*b^(5/2)*Log[f]^(5/2))
```

fricas [A] time = 0.42, size = 65, normalized size = 0.79

$$-\frac{3\sqrt{\pi}\sqrt{-b\log(f)}\,f^a\,\mathrm{erf}\left(\sqrt{-b\log(f)}\,x\right) - 2\left(2\,b^2x^3\log(f)^2 - 3\,bx\log(f)\right)f^{bx^2+a}}{8\,b^3\log(f)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^4,x, algorithm="fricas")
```

```
[Out] -1/8*(3*sqrt(pi)*sqrt(-b*log(f))*f^a*erf(sqrt(-b*log(f))*x) - 2*(2*b^2*x^3*
log(f)^2 - 3*b*x*log(f))*f^(b*x^2 + a))/(b^3*log(f)^3)
```

giac [A] time = 0.40, size = 68, normalized size = 0.83

$$-\frac{3\sqrt{\pi}\,f^a\,\mathrm{erf}\left(-\sqrt{-b\log(f)}\,x\right)}{8\sqrt{-b\log(f)}\,b^2\log(f)^2} + \frac{\left(2\,bx^3\log(f) - 3\,x\right)e^{\left(bx^2\log(f)+a\log(f)\right)}}{4\,b^2\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^4,x, algorithm="giac")
```

```
[Out] -3/8*sqrt(pi)*f^a*erf(-sqrt(-b*log(f))*x)/(sqrt(-b*log(f))*b^2*log(f)^2) +
1/4*(2*b*x^3*log(f) - 3*x)*e^(b*x^2*log(f) + a*log(f))/(b^2*log(f)^2)
```

maple [A] time = 0.05, size = 76, normalized size = 0.93

$$\frac{x^3 f^a f^{b x^2}}{2b\ln(f)} - \frac{3x f^a f^{b x^2}}{4b^2\ln(f)^2} + \frac{3\sqrt{\pi}\, f^a \operatorname{erf}\left(\sqrt{-b\ln(f)}\, x\right)}{8\sqrt{-b\ln(f)}\, b^2\ln(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)*x^4,x)
```

```
[Out] 1/2*f^a/ln(f)/b*x^3*f^(b*x^2)-3/4*f^a/ln(f)^2/b^2*x*f^(b*x^2)+3/8*f^a/ln(f)
^2/b^2*Pi^(1/2)/(-b*ln(f))^(1/2)*erf((-b*ln(f))^(1/2)*x)
```

maxima [A] time = 0.63, size = 67, normalized size = 0.82

$$\frac{\left(2\,bf^a x^3\log(f) - 3\,f^a x\right) f^{bx^2}}{4\,b^2\log(f)^2} + \frac{3\,\sqrt{\pi}\,f^a\operatorname{erf}\left(\sqrt{-b\log(f)}\,x\right)}{8\,\sqrt{-b\log(f)}\,b^2\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^4,x, algorithm="maxima")
```

```
[Out] 1/4*(2*b*f^a*x^3*log(f) - 3*f^a*x)*f^(b*x^2)/(b^2*log(f)^2) + 3/8*sqrt(pi)*
f^a*erf(sqrt(-b*log(f))*x)/(sqrt(-b*log(f))*b^2*log(f)^2)
```

mupad [B] time = 3.54, size = 75, normalized size = 0.91

$$\frac{f^a\,\left(3\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b\,x\,\ln(f)}{\sqrt{b\,\ln(f)}}\right) - 6\,f^{b\,x^2}\,x\,\sqrt{b\,\ln(f)}\right)}{8\,b^2\,{\ln(f)}^2\,\sqrt{b\,\ln(f)}} + \frac{f^a\,f^{b\,x^2}\,x^3}{2\,b\,\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)*x^4,x)
```

```
[Out] (f^a*(3*pi^(1/2)*erfi((b*x*log(f))/(b*log(f))^(1/2)) - 6*f^(b*x^2)*x*(b*log
(f))^(1/2)))/(8*b^2*log(f)^2*(b*log(f))^(1/2)) + (f^a*f^(b*x^2)*x^3)/(2*b*l
og(f))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+bx^2} x^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)*x**4,x)
[Out] Integral(f**(a + b*x**2)*x**4, x)
```

3.87 $\int f^{a+bx^2} x^2\, dx$

Optimal. Leaf size=59

$$\frac{xf^{a+bx^2}}{2b\log(f)}-\frac{\sqrt{\pi}\, f^a \text{erfi}\left(\sqrt{b}\, x\sqrt{\log(f)}\right)}{4b^{3/2}\log^{\frac{3}{2}}(f)}$$

```
[Out] 1/2*f^(b*x^2+a)*x/b/ln(f)-1/4*f^a*erfi(x*b^(1/2)*ln(f)^(1/2))*Pi^(1/2)/b^(3
/2)/ln(f)^(3/2)
```

Rubi [A] time = 0.03, antiderivative size = 59, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2212, 2204}

$$\frac{xf^{a+bx^2}}{2b\log(f)}-\frac{\sqrt{\pi}\, f^a \text{Erfi}\left(\sqrt{b}\, x\sqrt{\log(f)}\right)}{4b^{3/2}\log^{\frac{3}{2}}(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2)*x^2,x]
```

```
[Out] -(f^a*Sqrt[Pi]*Erfi[Sqrt[b]*x*Sqrt[Log[f]]])/(4*b^(3/2)*Log[f]^(3/2)) + (f^
(a + b*x^2)*x)/(2*b*Log[f])
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int f^{a+bx^2}x^2\,dx = \frac{f^{a+bx^2}x}{2b\log(f)} - \frac{\int f^{a+bx^2}\,dx}{2b\log(f)}$$
$$= -\frac{f^a\sqrt{\pi}\,\text{erfi}\left(\sqrt{b}\,x\sqrt{\log(f)}\right)}{4b^{3/2}\log^{\frac{3}{2}}(f)} + \frac{f^{a+bx^2}x}{2b\log(f)}$$

Mathematica [A] time = 0.02, size = 59, normalized size = 1.00

$$\frac{xf^{a+bx^2}}{2b\log(f)} - \frac{\sqrt{\pi}\,f^a\text{erfi}\left(\sqrt{b}\,x\sqrt{\log(f)}\right)}{4b^{3/2}\log^{\frac{3}{2}}(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2)*x^2,x]
```

```
[Out] -1/4*(f^a*Sqrt[Pi]*Erfi[Sqrt[b]*x*Sqrt[Log[f]]])/(b^(3/2)*Log[f]^(3/2)) + (
f^(a + b*x^2)*x)/(2*b*Log[f])
```

fricas [A] time = 0.41, size = 49, normalized size = 0.83

$$\frac{2\,bf^{bx^2+a}x\log(f) + \sqrt{\pi}\,\sqrt{-b\log(f)}\,f^a\,\text{erf}\left(\sqrt{-b\log(f)}\,x\right)}{4\,b^2\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^2,x, algorithm="fricas")
```

```
[Out] 1/4*(2*b*f^(b*x^2 + a)*x*log(f) + sqrt(pi)*sqrt(-b*log(f))*f^a*erf(sqrt(-b*
log(f))*x))/(b^2*log(f)^2)
```

giac [A] time = 0.27, size = 57, normalized size = 0.97

$$\frac{\sqrt{\pi}\,f^a\,\text{erf}\left(-\sqrt{-b\log(f)}\,x\right)}{4\,\sqrt{-b\log(f)}\,b\log(f)} + \frac{xe^{\left(bx^2\log(f)+a\log(f)\right)}}{2\,b\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^2,x, algorithm="giac")
```

```
[Out] 1/4*sqrt(pi)*f^a*erf(-sqrt(-b*log(f))*x)/(sqrt(-b*log(f))*b*log(f)) + 1/2*x
*e^(b*x^2*log(f) + a*log(f))/(b*log(f))
```

maple [A] time = 0.04, size = 54, normalized size = 0.92

$$\frac{x f^{a} f^{b x^{2}}}{2b\ln(f)} - \frac{\sqrt{\pi}\, f^{a} \operatorname{erf}\left(\sqrt{-b\ln(f)}\, x\right)}{4\sqrt{-b\ln(f)}\, b\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)*x^2,x)
```

```
[Out] 1/2*f^a/ln(f)/b*x*f^(b*x^2)-1/4*f^a/ln(f)/b*Pi^(1/2)/(-b*ln(f))^(1/2)*erf((
-b*ln(f))^(1/2)*x)
```

maxima [A] time = 0.78, size = 53, normalized size = 0.90

$$\frac{f^{bx^{2}} f^{a} x}{2\, b \log(f)} - \frac{\sqrt{\pi}\, f^{a} \operatorname{erf}\left(\sqrt{-b\log(f)}\, x\right)}{4\sqrt{-b\log(f)}\, b\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)*x^2,x, algorithm="maxima")
```

```
[Out] 1/2*f^(b*x^2)*f^a*x/(b*log(f)) - 1/4*sqrt(pi)*f^a*erf(sqrt(-b*log(f))*x)/(s
qrt(-b*log(f))*b*log(f))
```

mupad [B] time = 3.61, size = 54, normalized size = 0.92

$$\frac{f^{a} f^{b x^{2}} x}{2\, b\, \ln(f)} - \frac{f^{a} \sqrt{\pi}\, \operatorname{erfi}\left(\frac{b\, x\, \ln(f)}{\sqrt{b\, \ln(f)}}\right)}{4\, b\, \ln(f)\, \sqrt{b\, \ln(f)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)*x^2,x)
```

```
[Out] (f^a*f^(b*x^2)*x)/(2*b*log(f)) - (f^a*pi^(1/2)*erfi((b*x*log(f))/(b*log(f))
^(1/2)))/(4*b*log(f)*(b*log(f))^(1/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+bx^{2}} x^{2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)*x**2,x)
```

```
[Out] Integral(f**(a + b*x**2)*x**2, x)
```

3.88 $\int f^{a+bx^2}\,dx$

Optimal. Leaf size=37

$$\frac{\sqrt{\pi}\, f^a \text{erfi}\left(\sqrt{b}\, x \sqrt{\log(f)}\right)}{2\sqrt{b}\, \sqrt{\log(f)}}$$

```
[Out] 1/2*f^a*erfi(x*b^(1/2)*ln(f)^(1/2))*Pi^(1/2)/b^(1/2)/ln(f)^(1/2)
```

Rubi [A] time = 0.01, antiderivative size = 37, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2204}

$$\frac{\sqrt{\pi}\, f^a \text{Erfi}\left(\sqrt{b}\, x \sqrt{\log(f)}\right)}{2\sqrt{b}\, \sqrt{\log(f)}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2),x]
```

```
[Out] (f^a*Sqrt[Pi]*Erfi[Sqrt[b]*x*Sqrt[Log[f]]])/(2*Sqrt[b]*Sqrt[Log[f]])
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rubi steps

$$\int f^{a+bx^2}\,dx = \frac{f^a \sqrt{\pi}\, \text{erfi}\left(\sqrt{b}\, x \sqrt{\log(f)}\right)}{2\sqrt{b}\, \sqrt{\log(f)}}$$

Mathematica [A] time = 0.00, size = 37, normalized size = 1.00

$$\frac{\sqrt{\pi}\, f^a \text{erfi}\left(\sqrt{b}\, x \sqrt{\log(f)}\right)}{2\sqrt{b}\, \sqrt{\log(f)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2),x]
```

```
[Out] (f^a*Sqrt[Pi]*Erfi[Sqrt[b]*x*Sqrt[Log[f]]])/(2*Sqrt[b]*Sqrt[Log[f]])
```

fricas [A] time = 0.42, size = 32, normalized size = 0.86

$$-\frac{\sqrt{\pi}\sqrt{-b\log(f)}f^a\operatorname{erf}\left(\sqrt{-b\log(f)}x\right)}{2b\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a),x, algorithm="fricas")
[Out] -1/2*sqrt(pi)*sqrt(-b*log(f))*f^a*erf(sqrt(-b*log(f))*x)/(b*log(f))
```

giac [A] time = 0.28, size = 26, normalized size = 0.70

$$-\frac{\sqrt{\pi}f^a\operatorname{erf}\left(-\sqrt{-b\log(f)}x\right)}{2\sqrt{-b\log(f)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a),x, algorithm="giac")
[Out] -1/2*sqrt(pi)*f^a*erf(-sqrt(-b*log(f))*x)/sqrt(-b*log(f))
```

maple [A] time = 0.04, size = 26, normalized size = 0.70

$$\frac{\sqrt{\pi}\,f^a\operatorname{erf}\left(\sqrt{-b\ln(f)}\,x\right)}{2\sqrt{-b\ln(f)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a),x)
[Out] 1/2*f^a*Pi^(1/2)/(-b*ln(f))^(1/2)*erf((-b*ln(f))^(1/2)*x)
```

maxima [A] time = 0.92, size = 25, normalized size = 0.68

$$\frac{\sqrt{\pi}f^a\operatorname{erf}\left(\sqrt{-b\log(f)}x\right)}{2\sqrt{-b\log(f)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a),x, algorithm="maxima")
[Out] 1/2*sqrt(pi)*f^a*erf(sqrt(-b*log(f))*x)/sqrt(-b*log(f))
```

mupad [B] time = 3.55, size = 26, normalized size = 0.70

$$\frac{f^a\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\,x\,\ln(f)}{\sqrt{b\,\ln(f)}}\right)}{2\,\sqrt{b\,\ln(f)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2),x)
[Out] (f^a*pi^(1/2)*erfi((b*x*log(f))/(b*log(f))^(1/2)))/(2*(b*log(f))^(1/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+bx^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a),x)
[Out] Integral(f**(a + b*x**2), x)
```

3.89 $\int \frac{f^{a+bx^2}}{x^2} dx$

Optimal. Leaf size=49

$$\sqrt{\pi}\sqrt{b}f^a\sqrt{\log(f)}\,\text{erfi}\left(\sqrt{b}x\sqrt{\log(f)}\right)-\frac{f^{a+bx^2}}{x}$$

[Out] -f^(b*x^2+a)/x+f^a*erfi(x*b^(1/2)*ln(f)^(1/2))*b^(1/2)*Pi^(1/2)*ln(f)^(1/2)

Rubi [A] time = 0.03, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2214, 2204}

$$\sqrt{\pi}\sqrt{b}f^a\sqrt{\log(f)}\,\text{Erfi}\left(\sqrt{b}x\sqrt{\log(f)}\right)-\frac{f^{a+bx^2}}{x}$$

Antiderivative was successfully verified.

[In] Int[f^(a + b*x^2)/x^2,x]

[Out] -(f^(a + b*x^2)/x) + Sqrt[b]*f^a*Sqrt[Pi]*Erfi[Sqrt[b]*x*Sqrt[Log[f]]]*Sqrt[Log[f]]

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqrt[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{F, a, b, c, d}, x] && PosQ[b]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1)), x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0] && LeQ[-n, m + 1]))
```

Rubi steps

$$\int \frac{f^{a+bx^2}}{x^2}\,dx = -\frac{f^{a+bx^2}}{x} + (2b\log(f))\int f^{a+bx^2}\,dx$$
$$= -\frac{f^{a+bx^2}}{x} + \sqrt{b}\,f^a\sqrt{\pi}\,\text{erfi}\left(\sqrt{b}\,x\sqrt{\log(f)}\right)\sqrt{\log(f)}$$

Mathematica [A] time = 0.01, size = 49, normalized size = 1.00

$$\sqrt{\pi}\,\sqrt{b}\,f^a\sqrt{\log(f)}\,\text{erfi}\left(\sqrt{b}\,x\sqrt{\log(f)}\right) - \frac{f^{a+bx^2}}{x}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2)/x^2,x]
```

```
[Out] -(f^(a + b*x^2)/x) + Sqrt[b]*f^a*Sqrt[Pi]*Erfi[Sqrt[b]*x*Sqrt[Log[f]]]*Sqrt
[Log[f]]
```

fricas [A] time = 0.40, size = 40, normalized size = 0.82

$$-\frac{\sqrt{\pi}\,\sqrt{-b\log(f)}\,f^a x\,\text{erf}\left(\sqrt{-b\log(f)}\,x\right) + f^{bx^2+a}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^2,x, algorithm="fricas")
```

```
[Out] -(sqrt(pi)*sqrt(-b*log(f))*f^a*x*erf(sqrt(-b*log(f))*x) + f^(b*x^2 + a))/x
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{bx^2+a}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^2,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^2 + a)/x^2, x)
```

maple [A] time = 0.04, size = 44, normalized size = 0.90

$$\frac{\sqrt{\pi}\;b\,f^a\,\text{erf}\left(\sqrt{-b\ln(f)}\;x\right)\ln(f)}{\sqrt{-b\ln(f)}} - \frac{f^a f^{b\,x^2}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)/x^2,x)
```

```
[Out] -f^a/x*f^(b*x^2)+f^a*ln(f)*b*Pi^(1/2)/(-b*ln(f))^(1/2)*erf((-b*ln(f))^(1/2)
*x)
```

maxima [A] time = 1.27, size = 28, normalized size = 0.57

$$-\frac{\sqrt{-bx^2\log(f)}\, f^a\Gamma\left(-\frac{1}{2}, -bx^2\log(f)\right)}{2\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^2,x, algorithm="maxima")
```

```
[Out] -1/2*sqrt(-b*x^2*log(f))*f^a*gamma(-1/2, -b*x^2*log(f))/x
```

mupad [B] time = 3.47, size = 44, normalized size = 0.90

$$\frac{b\,f^a\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\,x\,\ln(f)}{\sqrt{b\,\ln(f)}}\right)\,\ln(f)}{\sqrt{b\,\ln(f)}}-\frac{f^a\,f^{b\,x^2}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)/x^2,x)
```

```
[Out] (b*f^a*pi^(1/2)*erfi((b*x*log(f))/(b*log(f))^(1/2))*log(f))/(b*log(f))^(1/2
) - (f^a*f^(b*x^2))/x
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+bx^2}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)/x**2,x)
```

```
[Out] Integral(f**(a + b*x**2)/x**2, x)
```

3.90 $\int \frac{f^{a+bx^2}}{x^4} dx$

Optimal. Leaf size=73

$$\frac{2}{3}\sqrt{\pi}\, b^{3/2} f^a \log^{\frac{3}{2}}(f)\text{erfi}\left(\sqrt{b}\, x\sqrt{\log(f)}\right) - \frac{2b\log(f) f^{a+bx^2}}{3x} - \frac{f^{a+bx^2}}{3x^3}$$

```
[Out] -1/3*f^(b*x^2+a)/x^3-2/3*b*f^(b*x^2+a)*ln(f)/x+2/3*b^(3/2)*f^a*erfi(x*b^(1/
2)*ln(f)^(1/2))*ln(f)^(3/2)*Pi^(1/2)
```

Rubi [A] time = 0.05, antiderivative size = 73, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2214, 2204}

$$\frac{2}{3}\sqrt{\pi}\, b^{3/2} f^a \log^{\frac{3}{2}}(f)\text{Erfi}\left(\sqrt{b}\, x\sqrt{\log(f)}\right) - \frac{f^{a+bx^2}}{3x^3} - \frac{2b\log(f) f^{a+bx^2}}{3x}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2)/x^4,x]
```

```
[Out] -f^(a + b*x^2)/(3*x^3) - (2*b*f^(a + b*x^2)*Log[f])/(3*x) + (2*b^(3/2)*f^a*
Sqrt[Pi]*Erfi[Sqrt[b]*x*Sqrt[Log[f]]]*Log[f]^(3/2))/3
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$
\begin{aligned}
\int \frac{f^{a+bx^2}}{x^4}\,dx &= -\frac{f^{a+bx^2}}{3x^3} + \frac{1}{3}(2b\log(f))\int \frac{f^{a+bx^2}}{x^2}\,dx \\
&= -\frac{f^{a+bx^2}}{3x^3} - \frac{2bf^{a+bx^2}\log(f)}{3x} + \frac{1}{3}\left(4b^2\log^2(f)\right)\int f^{a+bx^2}\,dx \\
&= -\frac{f^{a+bx^2}}{3x^3} - \frac{2bf^{a+bx^2}\log(f)}{3x} + \frac{2}{3}b^{3/2}f^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,x\sqrt{\log(f)}\right)\log^{\frac{3}{2}}(f)
\end{aligned}
$$

Mathematica [A] time = 0.04, size = 62, normalized size = 0.85

$$
\frac{1}{3}f^a\left(2\sqrt{\pi}\,b^{3/2}\log^{\frac{3}{2}}(f)\mathrm{erfi}\left(\sqrt{b}\,x\sqrt{\log(f)}\right) - \frac{f^{bx^2}\left(2bx^2\log(f)+1\right)}{x^3}\right)
$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2)/x^4,x]
```

```
[Out] (f^a*(2*b^(3/2)*Sqrt[Pi]*Erfi[Sqrt[b]*x*Sqrt[Log[f]]]*Log[f]^(3/2) - (f^(b*
x^2)*(1 + 2*b*x^2*Log[f]))/x^3))/3
```

fricas [A] time = 0.41, size = 57, normalized size = 0.78

$$
-\frac{2\sqrt{\pi}\sqrt{-b\log(f)}\,bf^a x^3\,\mathrm{erf}\left(\sqrt{-b\log(f)}\,x\right)\log(f) + \left(2\,bx^2\log(f)+1\right)f^{bx^2+a}}{3\,x^3}
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^4,x, algorithm="fricas")
```

```
[Out] -1/3*(2*sqrt(pi)*sqrt(-b*log(f))*b*f^a*x^3*erf(sqrt(-b*log(f))*x)*log(f) +
(2*b*x^2*log(f) + 1)*f^(b*x^2 + a))/x^3
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$
\int \frac{f^{bx^2+a}}{x^4}\,dx
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^4,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^2 + a)/x^4, x)
```

maple [A] time = 0.05, size = 67, normalized size = 0.92

$$\frac{2\sqrt{\pi}\, b^2 f^a \operatorname{erf}\left(\sqrt{-b\ln(f)}\, x\right)\ln(f)^2}{3\sqrt{-b\ln(f)}}-\frac{2b\, f^a f^{b\,x^2}\ln(f)}{3x}-\frac{f^a f^{b\,x^2}}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)/x^4,x)
```

```
[Out] -1/3*f^a/x^3*f^(b*x^2)-2/3*f^a*ln(f)*b/x*f^(b*x^2)+2/3*f^a*ln(f)^2*b^2*Pi^(
1/2)/(-b*ln(f))^(1/2)*erf((-b*ln(f))^(1/2)*x)
```

maxima [A] time = 1.15, size = 28, normalized size = 0.38

$$-\frac{\left(-bx^2\log(f)\right)^{\frac{3}{2}} f^a\Gamma\left(-\frac{3}{2},-bx^2\log(f)\right)}{2\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^4,x, algorithm="maxima")
```

```
[Out] -1/2*(-b*x^2*log(f))^(3/2)*f^a*gamma(-3/2, -b*x^2*log(f))/x^3
```

mupad [B] time = 3.56, size = 70, normalized size = 0.96

$$\frac{2\,b^2\,f^a\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b\,x\,\ln(f)}{\sqrt{b\,\ln(f)}}\right)\,\ln(f)^2}{3\,\sqrt{b\,\ln(f)}}-\frac{\frac{f^a\,f^{b\,x^2}}{3}+\frac{2\,b\,f^a\,f^{b\,x^2}\,x^2\,\ln(f)}{3}}{x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)/x^4,x)
```

```
[Out] (2*b^2*f^a*pi^(1/2)*erfi((b*x*log(f))/(b*log(f))^(1/2))*log(f)^2)/(3*(b*log
(f))^(1/2)) - ((f^a*f^(b*x^2))/3 + (2*b*f^a*f^(b*x^2)*x^2*log(f))/3)/x^3
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+bx^2}}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)/x**4,x)
```

```
[Out] Integral(f**(a + b*x**2)/x**4, x)
```

3.91 $\int \frac{f^{a+bx^2}}{x^6} dx$

Optimal. Leaf size=96

$$\frac{4}{15}\sqrt{\pi}\, b^{5/2} f^a \log^{\frac{5}{2}}(f)\text{erfi}\left(\sqrt{b}\, x\sqrt{\log(f)}\right) - \frac{4b^2 \log^2(f) f^{a+bx^2}}{15x} - \frac{f^{a+bx^2}}{5x^5} - \frac{2b\log(f) f^{a+bx^2}}{15x^3}$$

```
[Out] -1/5*f^(b*x^2+a)/x^5-2/15*b*f^(b*x^2+a)*ln(f)/x^3-4/15*b^2*f^(b*x^2+a)*ln(f
)^2/x+4/15*b^(5/2)*f^a*erfi(x*b^(1/2)*ln(f)^(1/2))*ln(f)^(5/2)*Pi^(1/2)
```

Rubi [A] time = 0.08, antiderivative size = 96, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2214, 2204}

$$\frac{4}{15}\sqrt{\pi}\, b^{5/2} f^a \log^{\frac{5}{2}}(f)\text{Erfi}\left(\sqrt{b}\, x\sqrt{\log(f)}\right) - \frac{4b^2 \log^2(f) f^{a+bx^2}}{15x} - \frac{f^{a+bx^2}}{5x^5} - \frac{2b\log(f) f^{a+bx^2}}{15x^3}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2)/x^6,x]
```

```
[Out] -f^(a + b*x^2)/(5*x^5) - (2*b*f^(a + b*x^2)*Log[f])/(15*x^3) - (4*b^2*f^(a
+ b*x^2)*Log[f]^2)/(15*x) + (4*b^(5/2)*f^a*Sqrt[Pi]*Erfi[Sqrt[b]*x*Sqrt[Log
[f]]]*Log[f]^(5/2))/15
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\begin{aligned}\int \frac{f^{a+bx^2}}{x^6}\,dx &= -\frac{f^{a+bx^2}}{5x^5}+\frac{1}{5}(2b\log(f))\int \frac{f^{a+bx^2}}{x^4}\,dx\\ &= -\frac{f^{a+bx^2}}{5x^5}-\frac{2bf^{a+bx^2}\log(f)}{15x^3}+\frac{1}{15}\left(4b^2\log^2(f)\right)\int \frac{f^{a+bx^2}}{x^2}\,dx\\ &= -\frac{f^{a+bx^2}}{5x^5}-\frac{2bf^{a+bx^2}\log(f)}{15x^3}-\frac{4b^2f^{a+bx^2}\log^2(f)}{15x}+\frac{1}{15}\left(8b^3\log^3(f)\right)\int f^{a+bx^2}\,dx\\ &= -\frac{f^{a+bx^2}}{5x^5}-\frac{2bf^{a+bx^2}\log(f)}{15x^3}-\frac{4b^2f^{a+bx^2}\log^2(f)}{15x}+\frac{4}{15}b^{5/2}f^a\sqrt{\pi}\,\text{erfi}\left(\sqrt{b}\,x\sqrt{\log(f)}\right)\log^{\frac{5}{2}}(f)\end{aligned}$$

Mathematica [A] time = 0.04, size = 77, normalized size = 0.80

$$\frac{f^a\left(4\sqrt{\pi}\,b^{5/2}x^5\log^{\frac{5}{2}}(f)\text{erfi}\left(\sqrt{b}\,x\sqrt{\log(f)}\right)-f^{bx^2}\left(4b^2x^4\log^2(f)+2bx^2\log(f)+3\right)\right)}{15x^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2)/x^6,x]
```

```
[Out] (f^a*(4*b^(5/2)*Sqrt[Pi]*x^5*Erfi[Sqrt[b]*x*Sqrt[Log[f]]]*Log[f]^(5/2) - f^
(b*x^2)*(3 + 2*b*x^2*Log[f] + 4*b^2*x^4*Log[f]^2)))/(15*x^5)
```

fricas [A] time = 0.41, size = 73, normalized size = 0.76

$$-\frac{4\sqrt{\pi}\,\sqrt{-b\log(f)}\,b^2f^ax^5\,\text{erf}\left(\sqrt{-b\log(f)}\,x\right)\log(f)^2+\left(4\,b^2x^4\log(f)^2+2\,bx^2\log(f)+3\right)f^{bx^2+a}}{15\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^6,x, algorithm="fricas")
```

```
[Out] -1/15*(4*sqrt(pi)*sqrt(-b*log(f))*b^2*f^a*x^5*erf(sqrt(-b*log(f))*x)*log(f)
^2 + (4*b^2*x^4*log(f)^2 + 2*b*x^2*log(f) + 3)*f^(b*x^2 + a))/x^5
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{bx^2+a}}{x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^6,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^2 + a)/x^6, x)
```

maple [A] time = 0.06, size = 89, normalized size = 0.93

$$\frac{4\sqrt{\pi}\, b^3 f^a \operatorname{erf}\left(\sqrt{-b\ln(f)}\, x\right)\ln(f)^3}{15\sqrt{-b\ln(f)}} - \frac{4b^2 f^a f^{b\,x^2}\ln(f)^2}{15x} - \frac{2b\,f^a f^{b\,x^2}\ln(f)}{15x^3} - \frac{f^a f^{b\,x^2}}{5x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)/x^6,x)
```

```
[Out] -1/5*f^a/x^5*f^(b*x^2)-2/15*f^a*ln(f)*b/x^3*f^(b*x^2)-4/15*f^a*ln(f)^2*b^2/
x*f^(b*x^2)+4/15*f^a*ln(f)^3*b^3*Pi^(1/2)/(-b*ln(f))^(1/2)*erf((-b*ln(f))^(
1/2)*x)
```

maxima [A] time = 1.34, size = 28, normalized size = 0.29

$$-\frac{\left(-bx^2\log(f)\right)^{\frac{5}{2}} f^a\Gamma\left(-\frac{5}{2}, -bx^2\log(f)\right)}{2\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^6,x, algorithm="maxima")
```

```
[Out] -1/2*(-b*x^2*log(f))^(5/2)*f^a*gamma(-5/2, -b*x^2*log(f))/x^5
```

mupad [B] time = 3.56, size = 109, normalized size = 1.14

$$\frac{4\,f^a\,\sqrt{\pi}\,\operatorname{erfc}\left(\sqrt{-b\,x^2\,\ln(f)}\right)\left(-b\,x^2\,\ln(f)\right)^{5/2}}{15\,x^5} - \frac{4\,f^a\,\sqrt{\pi}\,\left(-b\,x^2\,\ln(f)\right)^{5/2}}{15\,x^5} - \frac{f^a\,f^{b\,x^2}}{5\,x^5} - \frac{4\,b^2\,f^a\,f^{b\,x^2}\ln(f)^2}{15\,x} - \frac{2\,b\,f^a\,f}{1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)/x^6,x)
```

```
[Out] (4*f^a*pi^(1/2)*erfc((-b*x^2*log(f))^(1/2))*(-b*x^2*log(f))^(5/2))/(15*x^5)
 - (4*f^a*pi^(1/2)*(-b*x^2*log(f))^(5/2))/(15*x^5) - (f^a*f^(b*x^2))/(5*x^5
) - (4*b^2*f^a*f^(b*x^2)*log(f)^2)/(15*x) - (2*b*f^a*f^(b*x^2)*log(f))/(15*
x^3)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+bx^2}}{x^6}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)/x**6,x)
[Out] Integral(f**(a + b*x**2)/x**6, x)
```

3.92 $\int \frac{f^{a+bx^2}}{x^8} dx$

Optimal. Leaf size=119

$$\frac{8}{105}\sqrt{\pi}\, b^{7/2} f^a \log^{\frac{7}{2}}(f)\text{erfi}\left(\sqrt{b}\, x\sqrt{\log(f)}\right)-\frac{8b^3\log^3(f)f^{a+bx^2}}{105x}-\frac{4b^2\log^2(f)f^{a+bx^2}}{105x^3}-\frac{f^{a+bx^2}}{7x^7}-\frac{2b\log(f)f^{a+bx^2}}{35x^5}$$

```
[Out] -1/7*f^(b*x^2+a)/x^7-2/35*b*f^(b*x^2+a)*ln(f)/x^5-4/105*b^2*f^(b*x^2+a)*ln(
f)^2/x^3-8/105*b^3*f^(b*x^2+a)*ln(f)^3/x+8/105*b^(7/2)*f^a*erfi(x*b^(1/2)*l
n(f)^(1/2))*ln(f)^(7/2)*Pi^(1/2)
```

Rubi [A] time = 0.11, antiderivative size = 119, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2214, 2204}

$$\frac{8}{105}\sqrt{\pi}\, b^{7/2} f^a \log^{\frac{7}{2}}(f)\text{Erfi}\left(\sqrt{b}\, x\sqrt{\log(f)}\right)-\frac{8b^3\log^3(f)f^{a+bx^2}}{105x}-\frac{4b^2\log^2(f)f^{a+bx^2}}{105x^3}-\frac{f^{a+bx^2}}{7x^7}-\frac{2b\log(f)f^{a+bx^2}}{35x^5}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2)/x^8,x]
```

```
[Out] -f^(a + b*x^2)/(7*x^7) - (2*b*f^(a + b*x^2)*Log[f])/(35*x^5) - (4*b^2*f^(a
+ b*x^2)*Log[f]^2)/(105*x^3) - (8*b^3*f^(a + b*x^2)*Log[f]^3)/(105*x) + (8*
b^(7/2)*f^a*Sqrt[Pi]*Erfi[Sqrt[b]*x*Sqrt[Log[f]]]*Log[f]^(7/2))/105
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\int \frac{f^{a+bx^2}}{x^8}\,dx = -\frac{f^{a+bx^2}}{7x^7} + \frac{1}{7}(2b\log(f))\int \frac{f^{a+bx^2}}{x^6}\,dx$$
$$= -\frac{f^{a+bx^2}}{7x^7} - \frac{2bf^{a+bx^2}\log(f)}{35x^5} + \frac{1}{35}\left(4b^2\log^2(f)\right)\int \frac{f^{a+bx^2}}{x^4}\,dx$$
$$= -\frac{f^{a+bx^2}}{7x^7} - \frac{2bf^{a+bx^2}\log(f)}{35x^5} - \frac{4b^2f^{a+bx^2}\log^2(f)}{105x^3} + \frac{1}{105}\left(8b^3\log^3(f)\right)\int \frac{f^{a+bx^2}}{x^2}\,dx$$
$$= -\frac{f^{a+bx^2}}{7x^7} - \frac{2bf^{a+bx^2}\log(f)}{35x^5} - \frac{4b^2f^{a+bx^2}\log^2(f)}{105x^3} - \frac{8b^3f^{a+bx^2}\log^3(f)}{105x} + \frac{1}{105}\left(16b^4\log^4(f)\right)\int f^{a+}$$
$$= -\frac{f^{a+bx^2}}{7x^7} - \frac{2bf^{a+bx^2}\log(f)}{35x^5} - \frac{4b^2f^{a+bx^2}\log^2(f)}{105x^3} - \frac{8b^3f^{a+bx^2}\log^3(f)}{105x} + \frac{8}{105}b^{7/2}f^a\sqrt{\pi}\,\text{erfi}\left(\sqrt{b}\,x\sqrt{}\right.$$

Mathematica [A] time = 0.04, size = 89, normalized size = 0.75

$$\frac{f^a\left(8\sqrt{\pi}\,b^{7/2}x^7\log^{\frac{7}{2}}(f)\text{erfi}\left(\sqrt{b}\,x\sqrt{\log(f)}\right) - f^{bx^2}\left(8b^3x^6\log^3(f) + 4b^2x^4\log^2(f) + 6bx^2\log(f) + 15\right)\right)}{105x^7}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2)/x^8,x]
```

```
[Out] (f^a*(8*b^(7/2)*Sqrt[Pi]*x^7*Erfi[Sqrt[b]*x*Sqrt[Log[f]]]*Log[f]^(7/2) - f^
(b*x^2)*(15 + 6*b*x^2*Log[f] + 4*b^2*x^4*Log[f]^2 + 8*b^3*x^6*Log[f]^3)))/(
105*x^7)
```

fricas [A] time = 0.41, size = 85, normalized size = 0.71

$$-\frac{8\sqrt{\pi}\,\sqrt{-b\log(f)}\,b^3f^ax^7\,\text{erf}\left(\sqrt{-b\log(f)}\,x\right)\log(f)^3 + \left(8\,b^3x^6\log(f)^3 + 4\,b^2x^4\log(f)^2 + 6\,bx^2\log(f) + 15\right)f^{bx^2}}{105\,x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^8,x, algorithm="fricas")
```

```
[Out] -1/105*(8*sqrt(pi)*sqrt(-b*log(f))*b^3*f^a*x^7*erf(sqrt(-b*log(f))*x)*log(f
)^3 + (8*b^3*x^6*log(f)^3 + 4*b^2*x^4*log(f)^2 + 6*b*x^2*log(f) + 15)*f^(b*
x^2 + a))/x^7
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{bx^2+a}}{x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^8,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^2 + a)/x^8, x)
```

maple [A] time = 0.07, size = 111, normalized size = 0.93

$$\frac{8\sqrt{\pi}\, b^4 f^a \operatorname{erf}\left(\sqrt{-b\ln(f)}\, x\right)\ln(f)^4}{105\sqrt{-b\ln(f)}}-\frac{8b^3 f^a f^{b\,x^2}\ln(f)^3}{105x}-\frac{4b^2 f^a f^{b\,x^2}\ln(f)^2}{105x^3}-\frac{2b\, f^a f^{b\,x^2}\ln(f)}{35x^5}-\frac{f^a f^{b\,x^2}}{7x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)/x^8,x)
```

```
[Out] -1/7*f^a/x^7*f^(b*x^2)-2/35*f^a*ln(f)*b/x^5*f^(b*x^2)-4/105*f^a*ln(f)^2*b^2
/x^3*f^(b*x^2)-8/105*f^a*ln(f)^3*b^3/x*f^(b*x^2)+8/105*f^a*ln(f)^4*b^4*Pi^(
1/2)/(-b*ln(f))^(1/2)*erf((-b*ln(f))^(1/2)*x)
```

maxima [A] time = 1.30, size = 28, normalized size = 0.24

$$-\frac{\left(-bx^2\log(f)\right)^{\frac{7}{2}} f^a\Gamma\left(-\frac{7}{2}, -bx^2\log(f)\right)}{2\,x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^8,x, algorithm="maxima")
```

```
[Out] -1/2*(-b*x^2*log(f))^(7/2)*f^a*gamma(-7/2, -b*x^2*log(f))/x^7
```

mupad [B] time = 3.49, size = 131, normalized size = 1.10

$$\frac{8\,f^a\,\sqrt{\pi}\,\left(-b\,x^2\,\ln(f)\right)^{7/2}}{105\,x^7}-\frac{f^a\,f^{b\,x^2}}{7\,x^7}-\frac{8\,f^a\,\sqrt{\pi}\,\operatorname{erfc}\left(\sqrt{-b\,x^2\,\ln(f)}\right)\,\left(-b\,x^2\,\ln(f)\right)^{7/2}}{105\,x^7}-\frac{4\,b^2\,f^a\,f^{b\,x^2}\,\ln(f)^2}{105\,x^3}-\frac{8\,b^3\,f^a}{1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)/x^8,x)
```

```
[Out] (8*f^a*pi^(1/2)*(-b*x^2*log(f))^(7/2))/(105*x^7) - (f^a*f^(b*x^2))/(7*x^7)
- (8*f^a*pi^(1/2)*erfc((-b*x^2*log(f))^(1/2))*(-b*x^2*log(f))^(7/2))/(105*x
^7) - (4*b^2*f^a*f^(b*x^2)*log(f)^2)/(105*x^3) - (8*b^3*f^a*f^(b*x^2)*log(f
)^3)/(105*x) - (2*b*f^a*f^(b*x^2)*log(f))/(35*x^5)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+bx^2}}{x^8}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)/x**8,x)
```

```
[Out] Integral(f**(a + b*x**2)/x**8, x)
```

3.93 $\int \frac{f^{a+bx^2}}{x^{10}}\,dx$

Optimal. Leaf size=34

$$-\frac{f^a\left(-bx^2\log(f)\right)^{9/2}\Gamma\left(-\frac{9}{2},-bx^2\log(f)\right)}{2x^9}$$

```
[Out] -1/2*f^a*(-32/945*Pi^(1/2)*erfc((-b*x^2*ln(f))^(1/2))+32/945/(-b*x^2*ln(f))
^(1/2)*exp(b*x^2*ln(f))-16/945/(-b*x^2*ln(f))^(3/2)*exp(b*x^2*ln(f))+8/315/
(-b*x^2*ln(f))^(5/2)*exp(b*x^2*ln(f))-4/63/(-b*x^2*ln(f))^(7/2)*exp(b*x^2*l
n(f))+2/9/(-b*x^2*ln(f))^(9/2)*exp(b*x^2*ln(f)))*(-b*x^2*ln(f))^(9/2)/x^9
```

Rubi [A] time = 0.02, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2218}

$$-\frac{f^a\left(-bx^2\log(f)\right)^{9/2}\text{Gamma}\left(-\frac{9}{2},-bx^2\log(f)\right)}{2x^9}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2)/x^10,x]
```

```
[Out] -(f^a*Gamma[-9/2, -(b*x^2*Log[f])]*(-(b*x^2*Log[f]))^(9/2))/(2*x^9)
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+bx^2}}{x^{10}}\,dx = -\frac{f^a\Gamma\left(-\frac{9}{2},-bx^2\log(f)\right)\left(-bx^2\log(f)\right)^{9/2}}{2x^9}$$

Mathematica [A] time = 0.01, size = 34, normalized size = 1.00

$$-\frac{f^a\left(-bx^2\log(f)\right)^{9/2}\Gamma\left(-\frac{9}{2},-bx^2\log(f)\right)}{2x^9}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2)/x^10,x]
```

```
[Out] -1/2*(f^a*Gamma[-9/2, -(b*x^2*Log[f])]*(-(b*x^2*Log[f]))^(9/2))/x^9
```

fricas [A] time = 0.41, size = 97, normalized size = 2.85

$$-\frac{16\sqrt{\pi}\sqrt{-b\log(f)}\,b^4f^ax^9\,\mathrm{erf}\left(\sqrt{-b\log(f)}\,x\right)\log(f)^4+\left(16\,b^4x^8\log(f)^4+8\,b^3x^6\log(f)^3+12\,b^2x^4\log(f)^2+30\right.}{945\,x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^10,x, algorithm="fricas")
```

```
[Out] -1/945*(16*sqrt(pi)*sqrt(-b*log(f))*b^4*f^a*x^9*erf(sqrt(-b*log(f))*x)*log(
f)^4 + (16*b^4*x^8*log(f)^4 + 8*b^3*x^6*log(f)^3 + 12*b^2*x^4*log(f)^2 + 30
*b*x^2*log(f) + 105)*f^(b*x^2 + a))/x^9
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{f^{bx^2+a}}{x^{10}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^10,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^2 + a)/x^10, x)
```

maple [A] time = 0.08, size = 133, normalized size = 3.91

$$\frac{16\sqrt{\pi}\,b^5f^a\,\mathrm{erf}\left(\sqrt{-b\ln(f)}\,x\right)\ln(f)^5}{945\sqrt{-b\ln(f)}}-\frac{16b^4f^af^{bx^2}\ln(f)^4}{945x}-\frac{8b^3f^af^{bx^2}\ln(f)^3}{945x^3}-\frac{4b^2f^af^{bx^2}\ln(f)^2}{315x^5}-\frac{2b\,f^af^{bx^2}\ln(f)}{63x^7}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)/x^10,x)
```

```
[Out] -1/9*f^a/x^9*f^(b*x^2)-2/63*f^a*ln(f)*b/x^7*f^(b*x^2)-4/315*f^a*ln(f)^2*b^2
/x^5*f^(b*x^2)-8/945*f^a*ln(f)^3*b^3/x^3*f^(b*x^2)-16/945*f^a*ln(f)^4*b^4/x
*f^(b*x^2)+16/945*f^a*ln(f)^5*b^5*Pi^(1/2)/(-b*ln(f))^(1/2)*erf((-b*ln(f))^
(1/2)*x)
```

maxima [A] time = 1.26, size = 28, normalized size = 0.82

$$-\frac{\left(-bx^2\log(f)\right)^{\frac{9}{2}}f^a\Gamma\left(-\frac{9}{2},-bx^2\log(f)\right)}{2\,x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^10,x, algorithm="maxima")
```

```
[Out] -1/2*(-b*x^2*log(f))^(9/2)*f^a*gamma(-9/2, -b*x^2*log(f))/x^9
```

mupad [B] time = 3.51, size = 153, normalized size = 4.50

$$\frac{16\,f^a\,\sqrt{\pi}\,\mathrm{erfc}\left(\sqrt{-b\,x^2\,\ln(f)}\right)\,{\left(-b\,x^2\,\ln(f)\right)}^{9/2}}{945\,x^9}-\frac{16\,f^a\,\sqrt{\pi}\,{\left(-b\,x^2\,\ln(f)\right)}^{9/2}}{945\,x^9}-\frac{f^a\,f^{b\,x^2}}{9\,x^9}-\frac{4\,b^2\,f^a\,f^{b\,x^2}\,{\ln(f)}^2}{315\,x^5}-\frac{8\,b^3\,f$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)/x^10,x)
```

```
[Out] (16*f^a*pi^(1/2)*erfc((-b*x^2*log(f))^(1/2))*(-b*x^2*log(f))^(9/2))/(945*x^
9) - (16*f^a*pi^(1/2)*(-b*x^2*log(f))^(9/2))/(945*x^9) - (f^a*f^(b*x^2))/(9
*x^9) - (4*b^2*f^a*f^(b*x^2)*log(f)^2)/(315*x^5) - (8*b^3*f^a*f^(b*x^2)*log
(f)^3)/(945*x^3) - (16*b^4*f^a*f^(b*x^2)*log(f)^4)/(945*x) - (2*b*f^a*f^(b*
x^2)*log(f))/(63*x^7)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+bx^2}}{x^{10}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)/x**10,x)
```

```
[Out] Integral(f**(a + b*x**2)/x**10, x)
```

3.94 $\int \frac{f^{a+bx^2}}{x^{12}}\,dx$

Optimal. Leaf size=34

$$-\frac{f^a \left(-bx^2 \log(f)\right)^{11/2} \Gamma\left(-\frac{11}{2}, -bx^2 \log(f)\right)}{2x^{11}}$$

```
[Out] -1/2*f^a*(64/10395*Pi^(1/2)*erfc((-b*x^2*ln(f))^(1/2))-64/10395/(-b*x^2*ln(
f))^(1/2)*exp(b*x^2*ln(f))+32/10395/(-b*x^2*ln(f))^(3/2)*exp(b*x^2*ln(f))-1
6/3465/(-b*x^2*ln(f))^(5/2)*exp(b*x^2*ln(f))+8/693/(-b*x^2*ln(f))^(7/2)*exp
(b*x^2*ln(f))-4/99/(-b*x^2*ln(f))^(9/2)*exp(b*x^2*ln(f))+2/11/(-b*x^2*ln(f)
)^(11/2)*exp(b*x^2*ln(f)))*(-b*x^2*ln(f))^(11/2)/x^11
```

Rubi [A] time = 0.02, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2218}

$$-\frac{f^a \left(-bx^2 \log(f)\right)^{11/2} \text{Gamma}\left(-\frac{11}{2}, -bx^2 \log(f)\right)}{2x^{11}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^2)/x^12,x]
```

```
[Out] -(f^a*Gamma[-11/2, -(b*x^2*Log[f])]*(-(b*x^2*Log[f]))^(11/2))/(2*x^11)
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+bx^2}}{x^{12}}\,dx = -\frac{f^a\Gamma\left(-\frac{11}{2}, -bx^2 \log(f)\right)\left(-bx^2 \log(f)\right)^{11/2}}{2x^{11}}$$

Mathematica [A] time = 0.01, size = 34, normalized size = 1.00

$$-\frac{f^a \left(-bx^2 \log(f)\right)^{11/2} \Gamma\left(-\frac{11}{2}, -bx^2 \log(f)\right)}{2x^{11}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^2)/x^12,x]
```

```
[Out] -1/2*(f^a*Gamma[-11/2, -(b*x^2*Log[f])]*(-(b*x^2*Log[f]))^(11/2))/x^11
```

fricas [A] time = 0.48, size = 109, normalized size = 3.21

$$-\frac{32\,\sqrt{\pi}\,\sqrt{-b\log(f)}\,b^5 f^a x^{11}\,\mathrm{erf}\left(\sqrt{-b\log(f)}\,x\right)\log(f)^5+\left(32\,b^5x^{10}\log(f)^5+16\,b^4x^8\log(f)^4+24\,b^3x^6\log(f)^3\right.}{10395\,x^{11}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^12,x, algorithm="fricas")
```

```
[Out] -1/10395*(32*sqrt(pi)*sqrt(-b*log(f))*b^5*f^a*x^11*erf(sqrt(-b*log(f))*x)*l
og(f)^5 + (32*b^5*x^10*log(f)^5 + 16*b^4*x^8*log(f)^4 + 24*b^3*x^6*log(f)^3
 + 60*b^2*x^4*log(f)^2 + 210*b*x^2*log(f) + 945)*f^(b*x^2 + a))/x^11
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{bx^2+a}}{x^{12}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^12,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^2 + a)/x^12, x)
```

maple [A] time = 0.11, size = 155, normalized size = 4.56

$$\frac{32\sqrt{\pi}\;b^6 f^a\,\mathrm{erf}\left(\sqrt{-b\ln(f)}\;x\right)\ln(f)^6}{10395\sqrt{-b\ln(f)}}-\frac{32b^5 f^a f^{b\,x^2}\ln(f)^5}{10395x}-\frac{16b^4 f^a f^{b\,x^2}\ln(f)^4}{10395x^3}-\frac{8b^3 f^a f^{b\,x^2}\ln(f)^3}{3465x^5}-\frac{4b^2 f^a f^{b\,x^2}\ln(}{693x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^2+a)/x^12,x)
```

```
[Out] -1/11*f^a/x^11*f^(b*x^2)-2/99*f^a*ln(f)*b/x^9*f^(b*x^2)-4/693*f^a*ln(f)^2*b
^2/x^7*f^(b*x^2)-8/3465*f^a*ln(f)^3*b^3/x^5*f^(b*x^2)-16/10395*f^a*ln(f)^4*
b^4/x^3*f^(b*x^2)-32/10395*f^a*ln(f)^5*b^5/x*f^(b*x^2)+32/10395*f^a*ln(f)^6
*b^6*Pi^(1/2)/(-b*ln(f))^(1/2)*erf((-b*ln(f))^(1/2)*x)
```

maxima [A] time = 1.37, size = 28, normalized size = 0.82

$$-\frac{\left(-bx^2\log(f)\right)^{\frac{11}{2}}\;f^a\Gamma\left(-\frac{11}{2},-bx^2\log(f)\right)}{2\,x^{11}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^2+a)/x^12,x, algorithm="maxima")
```

```
[Out] -1/2*(-b*x^2*log(f))^(11/2)*f^a*gamma(-11/2, -b*x^2*log(f))/x^11
```

mupad [B] time = 3.63, size = 175, normalized size = 5.15

$$\frac{32\,f^a\,\sqrt{\pi}\,\left(-b\,x^2\,\ln(f)\right)^{11/2}}{10395\,x^{11}}-\frac{f^a\,f^{b\,x^2}}{11\,x^{11}}-\frac{32\,f^a\,\sqrt{\pi}\,\mathrm{erfc}\left(\sqrt{-b\,x^2\,\ln(f)}\right)\,\left(-b\,x^2\,\ln(f)\right)^{11/2}}{10395\,x^{11}}-\frac{4\,b^2\,f^a\,f^{b\,x^2}\,\ln(f)^2}{693\,x^7}-\frac{8\,b^3}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^2)/x^12,x)
```

```
[Out] (32*f^a*pi^(1/2)*(-b*x^2*log(f))^(11/2))/(10395*x^11) - (f^a*f^(b*x^2))/(11
*x^11) - (32*f^a*pi^(1/2)*erfc((-b*x^2*log(f))^(1/2))*(-b*x^2*log(f))^(11/2
))/(10395*x^11) - (4*b^2*f^a*f^(b*x^2)*log(f)^2)/(693*x^7) - (8*b^3*f^a*f^(
b*x^2)*log(f)^3)/(3465*x^5) - (16*b^4*f^a*f^(b*x^2)*log(f)^4)/(10395*x^3) -
 (32*b^5*f^a*f^(b*x^2)*log(f)^5)/(10395*x) - (2*b*f^a*f^(b*x^2)*log(f))/(99
*x^9)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+bx^2}}{x^{12}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**2+a)/x**12,x)
```

```
[Out] Integral(f**(a + b*x**2)/x**12, x)
```

3.95 $\int f^{a+bx^3} x^m \, dx$

Optimal. Leaf size=46

$$-\frac{1}{3} f^a x^{m+1} \left(-b x^3 \log(f)\right)^{\frac{1}{3}(-m-1)} \Gamma\left(\frac{m+1}{3}, -b x^3 \log(f)\right)$$

```
[Out] -1/3*f^a*x^(1+m)*GAMMA(1/3+1/3*m,-b*x^3*ln(f))*(-b*x^3*ln(f))^(-1/3-1/3*m)
```

Rubi [A] time = 0.02, antiderivative size = 46, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2218}

$$-\frac{1}{3} f^a x^{m+1} \left(-b x^3 \log(f)\right)^{\frac{1}{3}(-m-1)} \text{Gamma}\left(\frac{m+1}{3}, -b x^3 \log(f)\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^3)*x^m,x]
```

```
[Out] -(f^a*x^(1 + m)*Gamma[(1 + m)/3, -(b*x^3*Log[f])]*(-(b*x^3*Log[f]))^((-1 -
m)/3))/3
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+bx^3} x^m \, dx = -\frac{1}{3} f^a x^{1+m} \Gamma\left(\frac{1+m}{3}, -b x^3 \log(f)\right) \left(-b x^3 \log(f)\right)^{\frac{1}{3}(-1-m)}$$

Mathematica [A] time = 0.01, size = 46, normalized size = 1.00

$$-\frac{1}{3} f^a x^{m+1} \left(-b x^3 \log(f)\right)^{\frac{1}{3}(-m-1)} \Gamma\left(\frac{m+1}{3}, -b x^3 \log(f)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^3)*x^m,x]
```

```
[Out] -1/3*(f^a*x^(1 + m)*Gamma[(1 + m)/3, -(b*x^3*Log[f])]*(-(b*x^3*Log[f]))^((-
1 - m)/3))
```

fricas [A] time = 0.45, size = 40, normalized size = 0.87

$$\frac{e^{\left(-\frac{1}{3}(m-2)\log\left(-b\log(f)\right)+a\log(f)\right)}\Gamma\left(\frac{1}{3}m+\frac{1}{3},-bx^3\log(f)\right)}{3\,b\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^m,x, algorithm="fricas")
```

```
[Out] 1/3*e^(-1/3*(m - 2)*log(-b*log(f)) + a*log(f))*gamma(1/3*m + 1/3, -b*x^3*lo
g(f))/(b*log(f))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{bx^3+a}x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^m,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^3 + a)*x^m, x)
```

maple [B] time = 0.06, size = 140, normalized size = 3.04

$$\frac{\left(\frac{3\left(\frac{m}{3}+\frac{1}{3}\right)x^{m+1}(-b)^{\frac{m}{3}+\frac{1}{3}}\left(-b\,x^3\ln(f)\right)^{-\frac{m}{3}-\frac{1}{3}}\ln(f)^{\frac{m}{3}+\frac{1}{3}}\Gamma\left(\frac{m}{3}+\frac{1}{3}\right)}{m+1}+\frac{3\left(-\frac{m}{3}-\frac{1}{3}\right)x^{m+1}(-b)^{\frac{m}{3}+\frac{1}{3}}\left(-b\,x^3\ln(f)\right)^{-\frac{m}{3}-\frac{1}{3}}\ln(f)^{\frac{m}{3}+\frac{1}{3}}\Gamma\left(\frac{m}{3}+\frac{1}{3},-b\,x^3\ln(f)\right)}{m+1}\right)f^a}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^3+a)*x^m,x)
```

```
[Out] 1/3*f^a*(-b)^(-1/3*m-1/3)*ln(f)^(-1/3*m-1/3)*(3/(m+1)*x^(m+1)*(-b)^(1/3*m+1
/3)*ln(f)^(1/3*m+1/3)*(1/3*m+1/3)*(-b*x^3*ln(f))^(-1/3*m-1/3)*GAMMA(1/3*m+1
/3)+3/(m+1)*x^(m+1)*(-b)^(1/3*m+1/3)*ln(f)^(1/3*m+1/3)*(-1/3*m-1/3)*(-b*x^3
*ln(f))^(-1/3*m-1/3)*GAMMA(1/3*m+1/3,-b*x^3*ln(f)))
```

maxima [A] time = 1.32, size = 38, normalized size = 0.83

$$-\frac{1}{3}\left(-bx^3\log(f)\right)^{-\frac{1}{3}m-\frac{1}{3}}f^a x^{m+1}\Gamma\left(\frac{1}{3}m+\frac{1}{3},-bx^3\log(f)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^m,x, algorithm="maxima")
```

```
[Out] -1/3*(-b*x^3*log(f))^(-1/3*m - 1/3)*f^a*x^(m + 1)*gamma(1/3*m + 1/3, -b*x^3
*log(f))
```

mupad [B] time = 3.39, size = 56, normalized size = 1.22

$$\frac{f^a\,x^{m+1}\,\mathrm{e}^{\frac{b\,x^3\,\ln(f)}{2}}\,\mathrm{M}_{\frac{1}{3}-\frac{m}{6},\frac{m}{6}+\frac{1}{6}}\left(b\,x^3\,\ln(f)\right)}{(m+1)\,\left(b\,x^3\,\ln(f)\right)^{\frac{m}{6}+\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^3)*x^m,x)
```

```
[Out] (f^a*x^(m + 1)*exp((b*x^3*log(f))/2)*whittakerM(1/3 - m/6, m/6 + 1/6, b*x^3
*log(f)))/((m + 1)*(b*x^3*log(f))^(m/6 + 2/3))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+bx^3}x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**3+a)*x**m,x)
```

```
[Out] Integral(f**(a + b*x**3)*x**m, x)
```

3.96 $\int f^{a+bx^3} x^{17}\, dx$

Optimal. Leaf size=78

$$-\frac{f^{a+bx^3}\left(-b^5x^{15}\log^5(f)+5b^4x^{12}\log^4(f)-20b^3x^9\log^3(f)+60b^2x^6\log^2(f)-120bx^3\log(f)+120\right)}{3b^6\log^6(f)}$$

```
[Out] -1/3*f^(b*x^3+a)*(120-120*b*x^3*ln(f)+60*b^2*x^6*ln(f)^2-20*b^3*x^9*ln(f)^3
+5*b^4*x^12*ln(f)^4-b^5*x^15*ln(f)^5)/b^6/ln(f)^6
```

Rubi [C] time = 0.02, antiderivative size = 24, normalized size of antiderivative = 0.31, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2218}

$$-\frac{f^a\text{Gamma}\left(6,-bx^3\log(f)\right)}{3b^6\log^6(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^3)*x^17,x]
```

```
[Out] -(f^a*Gamma[6, -(b*x^3*Log[f])])/(3*b^6*Log[f]^6)
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+bx^3}x^{17}\,dx=-\frac{f^a\Gamma\left(6,-bx^3\log(f)\right)}{3b^6\log^6(f)}$$

Mathematica [C] time = 0.00, size = 24, normalized size = 0.31

$$-\frac{f^a\Gamma\left(6,-bx^3\log(f)\right)}{3b^6\log^6(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^3)*x^17,x]
```

```
[Out] -1/3*(f^a*Gamma[6, -(b*x^3*Log[f])])/(b^6*Log[f]^6)
```

fricas [A] time = 0.43, size = 75, normalized size = 0.96

$$\frac{\left(b^{5} x^{15} \log\left(f\right)^{5} - 5 \, b^{4} x^{12} \log\left(f\right)^{4} + 20 \, b^{3} x^{9} \log\left(f\right)^{3} - 60 \, b^{2} x^{6} \log\left(f\right)^{2} + 120 \, b x^{3} \log\left(f\right) - 120\right)} f^{b x^{3} + a}}{3 \, b^{6} \log\left(f\right)^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^17,x, algorithm="fricas")
```

```
[Out] 1/3*(b^5*x^15*log(f)^5 - 5*b^4*x^12*log(f)^4 + 20*b^3*x^9*log(f)^3 - 60*b^2
*x^6*log(f)^2 + 120*b*x^3*log(f) - 120)*f^(b*x^3 + a)/(b^6*log(f)^6)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^17,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:Polynomial exponent overflow. Error: Bad Arg
ument Value
```

maple [A] time = 0.01, size = 76, normalized size = 0.97

$$\frac{\left(b^{5} x^{15} \ln\left(f\right)^{5}-5 b^{4} x^{12} \ln\left(f\right)^{4}+20 b^{3} x^{9} \ln\left(f\right)^{3}-60 b^{2} x^{6} \ln\left(f\right)^{2}+120 b \,x^{3} \ln\left(f\right)-120\right) f^{b \,x^{3}+a}}{3 b^{6} \ln\left(f\right)^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^3+a)*x^17,x)
```

```
[Out] 1/3*(b^5*x^15*ln(f)^5-5*b^4*x^12*ln(f)^4+20*b^3*x^9*ln(f)^3-60*b^2*x^6*ln(f
)^2+120*b*x^3*ln(f)-120)*f^(b*x^3+a)/b^6/ln(f)^6
```

maxima [A] time = 0.93, size = 92, normalized size = 1.18

$$\frac{\left(b^{5} f^{a} x^{15} \log\left(f\right)^{5} - 5 \, b^{4} f^{a} x^{12} \log\left(f\right)^{4} + 20 \, b^{3} f^{a} x^{9} \log\left(f\right)^{3} - 60 \, b^{2} f^{a} x^{6} \log\left(f\right)^{2} + 120 \, b f^{a} x^{3} \log\left(f\right) - 120 \, f^{a}\right)} f^{b x^{3}}}{3 \, b^{6} \log\left(f\right)^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^17,x, algorithm="maxima")
```

```
[Out] 1/3*(b^5*f^a*x^15*log(f)^5 - 5*b^4*f^a*x^12*log(f)^4 + 20*b^3*f^a*x^9*log(f
)^3 - 60*b^2*f^a*x^6*log(f)^2 + 120*b*f^a*x^3*log(f) - 120*f^a)*f^(b*x^3)/(
b^6*log(f)^6)
```

mupad [B] time = 3.66, size = 76, normalized size = 0.97

$$-\frac{f^{b\,x^3+a}\,\left(-\frac{b^5\,x^{15}\,\ln(f)^5}{3}+\frac{5\,b^4\,x^{12}\,\ln(f)^4}{3}-\frac{20\,b^3\,x^9\,\ln(f)^3}{3}+20\,b^2\,x^6\,\ln(f)^2-40\,b\,x^3\,\ln(f)+40\right)}{b^6\,\ln(f)^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^3)*x^17,x)
```

```
[Out] -(f^(a + b*x^3)*(20*b^2*x^6*log(f)^2 - (20*b^3*x^9*log(f)^3)/3 + (5*b^4*x^1
2*log(f)^4)/3 - (b^5*x^15*log(f)^5)/3 - 40*b*x^3*log(f) + 40))/(b^6*log(f)^
6)
```

sympy [A] time = 0.17, size = 95, normalized size = 1.22

$$\begin{cases} \frac{f^{a+bx^3}\left(b^5x^{15}\log(f)^5-5b^4x^{12}\log(f)^4+20b^3x^9\log(f)^3-60b^2x^6\log(f)^2+120bx^3\log(f)-120\right)}{3b^6\log(f)^6} & \text{for } 3b^6\log(f)^6\neq 0 \\ \frac{x^{18}}{18} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**3+a)*x**17,x)
```

```
[Out] Piecewise((f**(a + b*x**3)*(b**5*x**15*log(f)**5 - 5*b**4*x**12*log(f)**4 +
 20*b**3*x**9*log(f)**3 - 60*b**2*x**6*log(f)**2 + 120*b*x**3*log(f) - 120)
/(3*b**6*log(f)**6), Ne(3*b**6*log(f)**6, 0)), (x**18/18, True))
```

3.97 $\int f^{a+bx^3} x^{14} \, dx$

Optimal. Leaf size=65

$$\frac{f^{a+bx^3} \left(b^4 x^{12} \log^4(f) - 4b^3 x^9 \log^3(f) + 12b^2 x^6 \log^2(f) - 24bx^3 \log(f) + 24\right)}{3b^5 \log^5(f)}$$

```
[Out] 1/3*f^(b*x^3+a)*(24-24*b*x^3*ln(f)+12*b^2*x^6*ln(f)^2-4*b^3*x^9*ln(f)^3+b^4
*x^12*ln(f)^4)/b^5/ln(f)^5
```

Rubi [C] time = 0.02, antiderivative size = 24, normalized size of antiderivative = 0.37, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2218}

$$\frac{f^a \text{Gamma}\left(5, -bx^3 \log(f)\right)}{3b^5 \log^5(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^3)*x^14,x]
```

```
[Out] (f^a*Gamma[5, -(b*x^3*Log[f])])/(3*b^5*Log[f]^5)
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+bx^3} x^{14} \, dx = \frac{f^a \Gamma\left(5, -bx^3 \log(f)\right)}{3b^5 \log^5(f)}$$

Mathematica [C] time = 0.00, size = 24, normalized size = 0.37

$$\frac{f^a \Gamma\left(5, -bx^3 \log(f)\right)}{3b^5 \log^5(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^3)*x^14,x]
```

```
[Out] (f^a*Gamma[5, -(b*x^3*Log[f])])/(3*b^5*Log[f]^5)
```

fricas [A] time = 0.42, size = 63, normalized size = 0.97

$$\frac{\left(b^{4} x^{12} \log(f)^{4} - 4 \, b^{3} x^{9} \log(f)^{3} + 12 \, b^{2} x^{6} \log(f)^{2} - 24 \, b x^{3} \log(f) + 24\right) f^{b x^{3} + a}}{3 \, b^{5} \log(f)^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^14,x, algorithm="fricas")
```

```
[Out] 1/3*(b^4*x^12*log(f)^4 - 4*b^3*x^9*log(f)^3 + 12*b^2*x^6*log(f)^2 - 24*b*x^
3*log(f) + 24)*f^(b*x^3 + a)/(b^5*log(f)^5)
```

giac [A] time = 0.28, size = 105, normalized size = 1.62

$$\frac{b^{4} f^{b x^{3}} f^{a} x^{12} \log(f)^{4} - 4 \, b^{3} f^{b x^{3}} f^{a} x^{9} \log(f)^{3} + 12 \, b^{2} f^{b x^{3}} f^{a} x^{6} \log(f)^{2} - 24 \, b f^{b x^{3}} f^{a} x^{3} \log(f) + 24 \, f^{b x^{3}} f^{a}}{3 \, b^{5} \log(f)^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^14,x, algorithm="giac")
```

```
[Out] 1/3*(b^4*f^(b*x^3)*f^a*x^12*log(f)^4 - 4*b^3*f^(b*x^3)*f^a*x^9*log(f)^3 + 1
2*b^2*f^(b*x^3)*f^a*x^6*log(f)^2 - 24*b*f^(b*x^3)*f^a*x^3*log(f) + 24*f^(b*
x^3)*f^a)/(b^5*log(f)^5)
```

maple [A] time = 0.01, size = 64, normalized size = 0.98

$$\frac{\left(b^{4} x^{12} \ln(f)^{4} - 4 b^{3} x^{9} \ln(f)^{3} + 12 b^{2} x^{6} \ln(f)^{2} - 24 b \,x^{3} \ln(f) + 24\right) f^{b \,x^{3} + a}}{3 b^{5} \ln(f)^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^3+a)*x^14,x)
```

```
[Out] 1/3*f^(b*x^3+a)*(24-24*b*x^3*ln(f)+12*b^2*x^6*ln(f)^2-4*b^3*x^9*ln(f)^3+b^4
*x^12*ln(f)^4)/b^5/ln(f)^5
```

maxima [A] time = 0.93, size = 77, normalized size = 1.18

$$\frac{\left(b^{4} f^{a} x^{12} \log(f)^{4} - 4 \, b^{3} f^{a} x^{9} \log(f)^{3} + 12 \, b^{2} f^{a} x^{6} \log(f)^{2} - 24 \, b f^{a} x^{3} \log(f) + 24 \, f^{a}\right) f^{b x^{3}}}{3 \, b^{5} \log(f)^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^14,x, algorithm="maxima")
```

```
[Out] 1/3*(b^4*f^a*x^12*log(f)^4 - 4*b^3*f^a*x^9*log(f)^3 + 12*b^2*f^a*x^6*log(f)
^2 - 24*b*f^a*x^3*log(f) + 24*f^a)*f^(b*x^3)/(b^5*log(f)^5)
```

mupad [B] time = 3.54, size = 63, normalized size = 0.97

$$\frac{f^{b\,x^3+a}\,\left(\frac{b^4\,x^{12}\,{\ln\left(f\right)}^4}{3}-\frac{4\,b^3\,x^9\,{\ln\left(f\right)}^3}{3}+4\,b^2\,x^6\,{\ln\left(f\right)}^2-8\,b\,x^3\,\ln\left(f\right)+8\right)}{b^5\,{\ln\left(f\right)}^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^3)*x^14,x)
```

```
[Out] (f^(a + b*x^3)*(4*b^2*x^6*log(f)^2 - (4*b^3*x^9*log(f)^3)/3 + (b^4*x^12*log
(f)^4)/3 - 8*b*x^3*log(f) + 8))/(b^5*log(f)^5)
```

sympy [A] time = 0.16, size = 82, normalized size = 1.26

$$\begin{cases} \frac{f^{a+bx^3}\left(b^4x^{12}\log{(f)}^4-4b^3x^9\log{(f)}^3+12b^2x^6\log{(f)}^2-24bx^3\log{(f)}+24\right)}{3b^5\log{(f)}^5} & \text{for } 3b^5\log{(f)}^5 \neq 0 \\ \frac{x^{15}}{15} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**3+a)*x**14,x)
```

```
[Out] Piecewise((f**(a + b*x**3)*(b**4*x**12*log(f)**4 - 4*b**3*x**9*log(f)**3 +
12*b**2*x**6*log(f)**2 - 24*b*x**3*log(f) + 24)/(3*b**5*log(f)**5), Ne(3*b*
*5*log(f)**5, 0)), (x**15/15, True))
```

3.98 $\int f^{a+bx^3} x^{11}\, dx$

Optimal. Leaf size=84

$$-\frac{2f^{a+bx^3}}{b^4\log^4(f)}+\frac{2x^3f^{a+bx^3}}{b^3\log^3(f)}-\frac{x^6f^{a+bx^3}}{b^2\log^2(f)}+\frac{x^9f^{a+bx^3}}{3b\log(f)}$$

```
[Out] -2*f^(b*x^3+a)/b^4/ln(f)^4+2*f^(b*x^3+a)*x^3/b^3/ln(f)^3-f^(b*x^3+a)*x^6/b^
2/ln(f)^2+1/3*f^(b*x^3+a)*x^9/b/ln(f)
```

Rubi [A] time = 0.10, antiderivative size = 84, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2212, 2209}

$$-\frac{x^6f^{a+bx^3}}{b^2\log^2(f)}+\frac{2x^3f^{a+bx^3}}{b^3\log^3(f)}-\frac{2f^{a+bx^3}}{b^4\log^4(f)}+\frac{x^9f^{a+bx^3}}{3b\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^3)*x^11,x]
```

```
[Out] (-2*f^(a + b*x^3))/(b^4*Log[f]^4) + (2*f^(a + b*x^3)*x^3)/(b^3*Log[f]^3) -
(f^(a + b*x^3)*x^6)/(b^2*Log[f]^2) + (f^(a + b*x^3)*x^9)/(3*b*Log[f])
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int f^{a+bx^3}x^{11}\,dx = \frac{f^{a+bx^3}x^9}{3b\log(f)} - \frac{3\int f^{a+bx^3}x^8\,dx}{b\log(f)}$$
$$= -\frac{f^{a+bx^3}x^6}{b^2\log^2(f)} + \frac{f^{a+bx^3}x^9}{3b\log(f)} + \frac{6\int f^{a+bx^3}x^5\,dx}{b^2\log^2(f)}$$
$$= \frac{2f^{a+bx^3}x^3}{b^3\log^3(f)} - \frac{f^{a+bx^3}x^6}{b^2\log^2(f)} + \frac{f^{a+bx^3}x^9}{3b\log(f)} - \frac{6\int f^{a+bx^3}x^2\,dx}{b^3\log^3(f)}$$
$$= -\frac{2f^{a+bx^3}}{b^4\log^4(f)} + \frac{2f^{a+bx^3}x^3}{b^3\log^3(f)} - \frac{f^{a+bx^3}x^6}{b^2\log^2(f)} + \frac{f^{a+bx^3}x^9}{3b\log(f)}$$

Mathematica [A] time = 0.01, size = 53, normalized size = 0.63

$$\frac{f^{a+bx^3}\left(b^3x^9\log^3(f) - 3b^2x^6\log^2(f) + 6bx^3\log(f) - 6\right)}{3b^4\log^4(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^3)*x^11,x]
```

```
[Out] (f^(a + b*x^3)*(-6 + 6*b*x^3*Log[f] - 3*b^2*x^6*Log[f]^2 + b^3*x^9*Log[f]^3
))/(3*b^4*Log[f]^4)
```

fricas [A] time = 0.43, size = 51, normalized size = 0.61

$$\frac{\left(b^3x^9\log(f)^3 - 3\,b^2x^6\log(f)^2 + 6\,bx^3\log(f) - 6\right)f^{bx^3+a}}{3\,b^4\log(f)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^11,x, algorithm="fricas")
```

```
[Out] 1/3*(b^3*x^9*log(f)^3 - 3*b^2*x^6*log(f)^2 + 6*b*x^3*log(f) - 6)*f^(b*x^3 +
 a)/(b^4*log(f)^4)
```

giac [A] time = 0.19, size = 83, normalized size = 0.99

$$\frac{b^3f^{bx^3}f^ax^9\log(f)^3 - 3\,b^2f^{bx^3}f^ax^6\log(f)^2 + 6\,bf^{bx^3}f^ax^3\log(f) - 6\,f^{bx^3}f^a}{3\,b^4\log(f)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^11,x, algorithm="giac")
```

```
[Out] 1/3*(b^3*f^(b*x^3)*f^a*x^9*log(f)^3 - 3*b^2*f^(b*x^3)*f^a*x^6*log(f)^2 + 6*
b*f^(b*x^3)*f^a*x^3*log(f) - 6*f^(b*x^3)*f^a)/(b^4*log(f)^4)
```

maple [A] time = 0.01, size = 52, normalized size = 0.62

$$\frac{\left(b^{3}x^{9}\ln(f)^{3}-3b^{2}x^{6}\ln(f)^{2}+6b\,x^{3}\ln(f)-6\right)f^{b\,x^{3}+a}}{3b^{4}\ln(f)^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^3+a)*x^11,x)
```

```
[Out] 1/3*(b^3*x^9*ln(f)^3-3*b^2*x^6*ln(f)^2+6*b*x^3*ln(f)-6)*f^(b*x^3+a)/ln(f)^4
/b^4
```

maxima [A] time = 0.98, size = 62, normalized size = 0.74

$$\frac{\left(b^{3}f^{a}x^{9}\log(f)^{3}-3\,b^{2}f^{a}x^{6}\log(f)^{2}+6\,bf^{a}x^{3}\log(f)-6\,f^{a}\right)f^{bx^{3}}}{3\,b^{4}\log(f)^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^11,x, algorithm="maxima")
```

```
[Out] 1/3*(b^3*f^a*x^9*log(f)^3 - 3*b^2*f^a*x^6*log(f)^2 + 6*b*f^a*x^3*log(f) - 6
*f^a)*f^(b*x^3)/(b^4*log(f)^4)
```

mupad [B] time = 3.46, size = 51, normalized size = 0.61

$$-\frac{f^{b\,x^{3}+a}\,\left(-\frac{b^{3}\,x^{9}\,\ln(f)^{3}}{3}+b^{2}\,x^{6}\,\ln(f)^{2}-2\,b\,x^{3}\,\ln(f)+2\right)}{b^{4}\,\ln(f)^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^3)*x^11,x)
```

```
[Out] -(f^(a + b*x^3)*(b^2*x^6*log(f)^2 - (b^3*x^9*log(f)^3)/3 - 2*b*x^3*log(f) +
 2))/(b^4*log(f)^4)
```

sympy [A] time = 0.15, size = 68, normalized size = 0.81

$$\begin{cases} \frac{f^{a+bx^{3}}\left(b^{3}x^{9}\log{(f)}^{3}-3b^{2}x^{6}\log{(f)}^{2}+6bx^{3}\log{(f)}-6\right)}{3b^{4}\log{(f)}^{4}} & \text{for}\ 3b^{4}\log{(f)}^{4}\neq 0 \\ \frac{x^{12}}{12} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**3+a)*x**11,x)
```

```
[Out] Piecewise((f**(a + b*x**3)*(b**3*x**9*log(f)**3 - 3*b**2*x**6*log(f)**2 + 6
*b*x**3*log(f) - 6)/(3*b**4*log(f)**4), Ne(3*b**4*log(f)**4, 0)), (x**12/12
, True))
```

3.99 $\int f^{a+bx^3} x^8 \, dx$

Optimal. Leaf size=67

$$\frac{2f^{a+bx^3}}{3b^3\log^3(f)} - \frac{2x^3f^{a+bx^3}}{3b^2\log^2(f)} + \frac{x^6f^{a+bx^3}}{3b\log(f)}$$

```
[Out] 2/3*f^(b*x^3+a)/b^3/ln(f)^3-2/3*f^(b*x^3+a)*x^3/b^2/ln(f)^2+1/3*f^(b*x^3+a)
*x^6/b/ln(f)
```

Rubi [A] time = 0.07, antiderivative size = 67, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2212, 2209}

$$-\frac{2x^3f^{a+bx^3}}{3b^2\log^2(f)} + \frac{2f^{a+bx^3}}{3b^3\log^3(f)} + \frac{x^6f^{a+bx^3}}{3b\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^3)*x^8,x]
```

```
[Out] (2*f^(a + b*x^3))/(3*b^3*Log[f]^3) - (2*f^(a + b*x^3)*x^3)/(3*b^2*Log[f]^2)
 + (f^(a + b*x^3)*x^6)/(3*b*Log[f])
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int f^{a+bx^3}x^8\,dx = \frac{f^{a+bx^3}x^6}{3b\log(f)} - \frac{2\int f^{a+bx^3}x^5\,dx}{b\log(f)}$$
$$= -\frac{2f^{a+bx^3}x^3}{3b^2\log^2(f)} + \frac{f^{a+bx^3}x^6}{3b\log(f)} + \frac{2\int f^{a+bx^3}x^2\,dx}{b^2\log^2(f)}$$
$$= \frac{2f^{a+bx^3}}{3b^3\log^3(f)} - \frac{2f^{a+bx^3}x^3}{3b^2\log^2(f)} + \frac{f^{a+bx^3}x^6}{3b\log(f)}$$

Mathematica [A] time = 0.01, size = 41, normalized size = 0.61

$$\frac{f^{a+bx^3}\left(b^2x^6\log^2(f) - 2bx^3\log(f) + 2\right)}{3b^3\log^3(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^3)*x^8,x]
[Out] (f^(a + b*x^3)*(2 - 2*b*x^3*Log[f] + b^2*x^6*Log[f]^2))/(3*b^3*Log[f]^3)
```

fricas [A] time = 0.42, size = 39, normalized size = 0.58

$$\frac{\left(b^2x^6\log(f)^2 - 2\,bx^3\log(f) + 2\right)f^{bx^3+a}}{3\,b^3\log(f)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^8,x, algorithm="fricas")
[Out] 1/3*(b^2*x^6*log(f)^2 - 2*b*x^3*log(f) + 2)*f^(b*x^3 + a)/(b^3*log(f)^3)
```

giac [A] time = 0.22, size = 61, normalized size = 0.91

$$\frac{b^2f^{bx^3}f^ax^6\log(f)^2 - 2\,bf^{bx^3}f^ax^3\log(f) + 2\,f^{bx^3}f^a}{3\,b^3\log(f)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^8,x, algorithm="giac")
[Out] 1/3*(b^2*f^(b*x^3)*f^a*x^6*log(f)^2 - 2*b*f^(b*x^3)*f^a*x^3*log(f) + 2*f^(b
*x^3)*f^a)/(b^3*log(f)^3)
```

maple [A] time = 0.01, size = 40, normalized size = 0.60

$$\frac{\left(b^{2} x^{6} \ln(f)^{2}-2 b\, x^{3} \ln(f)+2\right) f^{b\, x^{3}+a}}{3 b^{3} \ln(f)^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^3+a)*x^8,x)
```

```
[Out] 1/3*(b^2*x^6*ln(f)^2-2*b*x^3*ln(f)+2)*f^(b*x^3+a)/ln(f)^3/b^3
```

maxima [A] time = 0.95, size = 47, normalized size = 0.70

$$\frac{\left(b^{2} f^{a} x^{6} \log(f)^{2}-2\, b f^{a} x^{3} \log(f)+2\, f^{a}\right) f^{b x^{3}}}{3\, b^{3} \log(f)^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^8,x, algorithm="maxima")
```

```
[Out] 1/3*(b^2*f^a*x^6*log(f)^2 - 2*b*f^a*x^3*log(f) + 2*f^a)*f^(b*x^3)/(b^3*log(
f)^3)
```

mupad [B] time = 3.47, size = 39, normalized size = 0.58

$$\frac{f^{b\, x^{3}+a} \left(\frac{b^{2}\, x^{6} \ln(f)^{2}}{3}-\frac{2\, b\, x^{3} \ln(f)}{3}+\frac{2}{3}\right)}{b^{3} \ln(f)^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^3)*x^8,x)
```

```
[Out] (f^(a + b*x^3)*((b^2*x^6*log(f)^2)/3 - (2*b*x^3*log(f))/3 + 2/3))/(b^3*log(
f)^3)
```

sympy [A] time = 0.14, size = 54, normalized size = 0.81

$$\begin{cases} \frac{f^{a+b x^{3}} \left(b^{2} x^{6} \log{\left(f \right)}^{2}-2 b x^{3} \log{\left(f \right)}+2\right)}{3 b^{3} \log{\left(f \right)}^{3}} & \text{for}\: 3 b^{3} \log{\left(f \right)}^{3} \neq 0 \\ \frac{x^{9}}{9} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**3+a)*x**8,x)
```

```
[Out] Piecewise((f**(a + b*x**3)*(b**2*x**6*log(f)**2 - 2*b*x**3*log(f) + 2)/(3*b
**3*log(f)**3), Ne(3*b**3*log(f)**3, 0)), (x**9/9, True))
```

3.100 $\int f^{a+bx^3} x^5 \, dx$

Optimal. Leaf size=44

$$\frac{x^3 f^{a+bx^3}}{3b\log(f)} - \frac{f^{a+bx^3}}{3b^2\log^2(f)}$$

```
[Out] -1/3*f^(b*x^3+a)/b^2/ln(f)^2+1/3*f^(b*x^3+a)*x^3/b/ln(f)
```

Rubi [A] time = 0.04, antiderivative size = 44, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {2212, 2209}

$$\frac{x^3 f^{a+bx^3}}{3b\log(f)} - \frac{f^{a+bx^3}}{3b^2\log^2(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^3)*x^5,x]
```

```
[Out] -f^(a + b*x^3)/(3*b^2*Log[f]^2) + (f^(a + b*x^3)*x^3)/(3*b*Log[f])
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int f^{a+bx^3}x^5\,dx = \frac{f^{a+bx^3}x^3}{3b\log(f)} - \frac{\int f^{a+bx^3}x^2\,dx}{b\log(f)}$$
$$= -\frac{f^{a+bx^3}}{3b^2\log^2(f)} + \frac{f^{a+bx^3}x^3}{3b\log(f)}$$

Mathematica [A] time = 0.01, size = 29, normalized size = 0.66

$$\frac{f^{a+bx^3}\left(bx^3\log(f)-1\right)}{3b^2\log^2(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^3)*x^5,x]
[Out] (f^(a + b*x^3)*(-1 + b*x^3*Log[f]))/(3*b^2*Log[f]^2)
```

fricas [A] time = 0.45, size = 27, normalized size = 0.61

$$\frac{\left(bx^3\log(f)-1\right)f^{bx^3+a}}{3\,b^2\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^5,x, algorithm="fricas")
[Out] 1/3*(b*x^3*log(f) - 1)*f^(b*x^3 + a)/(b^2*log(f)^2)
```

giac [B] time = 0.28, size = 690, normalized size = 15.68

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^5,x, algorithm="giac")
[Out] 1/3*(2*((b*x^3*log(abs(f)) - 1)*(pi^2*b^2*sgn(f) - pi^2*b^2 + 2*b^2*log(abs
(f))^2)/((pi^2*b^2*sgn(f) - pi^2*b^2 + 2*b^2*log(abs(f))^2)^2 + 4*(pi*b^2*l
og(abs(f))*sgn(f) - pi*b^2*log(abs(f)))^2) + (pi*b*x^3*sgn(f) - pi*b*x^3)*(
pi*b^2*log(abs(f))*sgn(f) - pi*b^2*log(abs(f)))/((pi^2*b^2*sgn(f) - pi^2*b^
2 + 2*b^2*log(abs(f))^2)^2 + 4*(pi*b^2*log(abs(f))*sgn(f) - pi*b^2*log(abs(
f)))^2))*cos(-1/2*pi*b*x^3*sgn(f) + 1/2*pi*b*x^3 - 1/2*pi*a*sgn(f) + 1/2*pi
*a) + ((pi*b*x^3*sgn(f) - pi*b*x^3)*(pi^2*b^2*sgn(f) - pi^2*b^2 + 2*b^2*log
```

```
(abs(f))^2)/((pi^2*b^2*sgn(f) - pi^2*b^2 + 2*b^2*log(abs(f))^2)^2 + 4*(pi*b
^2*log(abs(f))*sgn(f) - pi*b^2*log(abs(f)))^2) - 4*(b*x^3*log(abs(f)) - 1)*
(pi*b^2*log(abs(f))*sgn(f) - pi*b^2*log(abs(f)))/((pi^2*b^2*sgn(f) - pi^2*b
^2 + 2*b^2*log(abs(f))^2)^2 + 4*(pi*b^2*log(abs(f))*sgn(f) - pi*b^2*log(abs
(f)))^2))*sin(-1/2*pi*b*x^3*sgn(f) + 1/2*pi*b*x^3 - 1/2*pi*a*sgn(f) + 1/2*p
i*a))*e^(b*x^3*log(abs(f)) + a*log(abs(f))) - 1/6*((2*b*i*x^3*log(abs(f)) -
 pi*b*x^3*sgn(f) + pi*b*x^3 - 2*i)*e^(1/2*(pi*b*x^3*(sgn(f) - 1) + pi*a*(sg
n(f) - 1))*i)/(2*pi*b^2*i*log(abs(f))*sgn(f) - 2*pi*b^2*i*log(abs(f)) + pi^
2*b^2*sgn(f) - pi^2*b^2 + 2*b^2*log(abs(f))^2) + (2*b*i*x^3*log(abs(f)) + p
i*b*x^3*sgn(f) - pi*b*x^3 - 2*i)*e^(-1/2*(pi*b*x^3*(sgn(f) - 1) + pi*a*(sgn
(f) - 1))*i)/(2*pi*b^2*i*log(abs(f))*sgn(f) - 2*pi*b^2*i*log(abs(f)) - pi^2
*b^2*sgn(f) + pi^2*b^2 - 2*b^2*log(abs(f))^2))*e^(b*x^3*log(abs(f)) + a*log
(abs(f)))/i
```

maple [A] time = 0.01, size = 28, normalized size = 0.64

$$\frac{\left(b\,x^{3}\ln\left(f\right)-1\right)f^{b\,x^{3}+a}}{3b^{2}\ln\left(f\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^3+a)*x^5,x)
```

```
[Out] 1/3*(b*x^3*ln(f)-1)*f^(b*x^3+a)/ln(f)^2/b^2
```

maxima [A] time = 0.91, size = 32, normalized size = 0.73

$$\frac{\left(bf^{a}x^{3}\log\left(f\right)-f^{a}\right)f^{bx^{3}}}{3\,b^{2}\log\left(f\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^5,x, algorithm="maxima")
```

```
[Out] 1/3*(b*f^a*x^3*log(f) - f^a)*f^(b*x^3)/(b^2*log(f)^2)
```

mupad [B] time = 3.25, size = 27, normalized size = 0.61

$$\frac{f^{b\,x^{3}+a}\,\left(\frac{b\,x^{3}\,\ln\left(f\right)}{3}-\frac{1}{3}\right)}{b^{2}\,{\ln\left(f\right)}^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^3)*x^5,x)
```

```
[Out] (f^(a + b*x^3)*((b*x^3*log(f))/3 - 1/3))/(b^2*log(f)^2)
```

sympy [A] time = 0.12, size = 41, normalized size = 0.93

$$\begin{cases} \frac{f^{a+bx^3}\left(bx^3\log\left(f\right)-1\right)}{3b^2\log\left(f\right)^2} & \text{for } 3b^2\log\left(f\right)^2 \neq 0 \\ \frac{x^6}{6} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**3+a)*x**5,x)
```

```
[Out] Piecewise((f**(a + b*x**3)*(b*x**3*log(f) - 1)/(3*b**2*log(f)**2), Ne(3*b**
2*log(f)**2, 0)), (x**6/6, True))
```

3.101 $\int f^{a+bx^3} x^2 \, dx$

Optimal. Leaf size=20

$$\frac{f^{a+bx^3}}{3b\log(f)}$$

```
[Out] 1/3*f^(b*x^3+a)/b/ln(f)
```

Rubi [A] time = 0.02, antiderivative size = 20, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2209}

$$\frac{f^{a+bx^3}}{3b\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^3)*x^2,x]
[Out] f^(a + b*x^3)/(3*b*Log[f])
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+bx^3} x^2 \, dx = \frac{f^{a+bx^3}}{3b\log(f)}$$

Mathematica [A] time = 0.00, size = 20, normalized size = 1.00

$$\frac{f^{a+bx^3}}{3b\log(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^3)*x^2,x]
[Out] f^(a + b*x^3)/(3*b*Log[f])
```

fricas [A] time = 0.44, size = 18, normalized size = 0.90

$$\frac{f^{bx^3+a}}{3\,b\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^2,x, algorithm="fricas")
[Out] 1/3*f^(b*x^3 + a)/(b*log(f))
```

giac [A] time = 0.21, size = 18, normalized size = 0.90

$$\frac{f^{bx^3+a}}{3\,b\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^2,x, algorithm="giac")
[Out] 1/3*f^(b*x^3 + a)/(b*log(f))
```

maple [A] time = 0.00, size = 19, normalized size = 0.95

$$\frac{f^{b\,x^3+a}}{3b\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^3+a)*x^2,x)
[Out] 1/3*f^(b*x^3+a)/b/ln(f)
```

maxima [A] time = 0.93, size = 18, normalized size = 0.90

$$\frac{f^{bx^3+a}}{3\,b\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^2,x, algorithm="maxima")
[Out] 1/3*f^(b*x^3 + a)/(b*log(f))
```

mupad [B] time = 3.47, size = 18, normalized size = 0.90

$$\frac{f^{b\,x^3+a}}{3\,b\,\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^3)*x^2,x)
```

```
[Out] f^(a + b*x^3)/(3*b*log(f))
```

sympy [**A**] time = 0.11, size = 24, normalized size = 1.20

$$\begin{cases} \frac{f^{a+bx^3}}{3b\log(f)} & \text{for } 3b\log(f) \neq 0 \\ \frac{x^3}{3} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**3+a)*x**2,x)
```

```
[Out] Piecewise((f**(a + b*x**3)/(3*b*log(f)), Ne(3*b*log(f), 0)), (x**3/3, True)
)
```

3.102 $\int \frac{f^{a+bx^3}}{x} dx$

Optimal. Leaf size=15

$$\frac{1}{3}f^a\text{Ei}\left(bx^3\log(f)\right)$$

```
[Out] 1/3*f^a*Ei(b*x^3*ln(f))
```

Rubi [A] time = 0.02, antiderivative size = 15, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2210}

$$\frac{1}{3}f^a\text{Ei}\left(bx^3\log(f)\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^3)/x,x]
```

```
[Out] (f^a*ExpIntegralEi[b*x^3*Log[f]])/3
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+bx^3}}{x} dx = \frac{1}{3}f^a\text{Ei}\left(bx^3\log(f)\right)$$

Mathematica [A] time = 0.00, size = 15, normalized size = 1.00

$$\frac{1}{3}f^a\text{Ei}\left(bx^3\log(f)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^3)/x,x]
```

```
[Out] (f^a*ExpIntegralEi[b*x^3*Log[f]])/3
```

fricas [A] time = 0.41, size = 13, normalized size = 0.87

$$\frac{1}{3} f^a \text{Ei}\left(bx^3 \log(f)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)/x,x, algorithm="fricas")
[Out] 1/3*f^a*Ei(b*x^3*log(f))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{bx^3+a}}{x} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)/x,x, algorithm="giac")
[Out] integrate(f^(b*x^3 + a)/x, x)
```

maple [B] time = 0.04, size = 41, normalized size = 2.73

$$\frac{\left(-\text{Ei}\left(1,-b\,x^3 \ln(f)\right)+3\ln(x)+\ln(-b)-\ln\left(-b\,x^3 \ln(f)\right)+\ln\left(\ln(f)\right)\right) f^a}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^3+a)/x,x)
[Out] 1/3*f^a*(-ln(-b*x^3*ln(f))-Ei(1,-b*x^3*ln(f))+3*ln(x)+ln(-b)+ln(ln(f)))
```

maxima [A] time = 1.32, size = 13, normalized size = 0.87

$$\frac{1}{3} f^a \text{Ei}\left(bx^3 \log(f)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)/x,x, algorithm="maxima")
[Out] 1/3*f^a*Ei(b*x^3*log(f))
```

mupad [B] time = 3.24, size = 13, normalized size = 0.87

$$\frac{f^a\,\mathrm{ei}\left(b\,x^3\,\ln(f)\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^3)/x,x)
```

```
[Out] (f^a*ei(b*x^3*log(f)))/3
```

sympy [F]   time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+bx^3}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**3+a)/x,x)
```

```
[Out] Integral(f**(a + b*x**3)/x, x)
```

3.103 $\int \frac{f^{a+bx^3}}{x^4} dx$

Optimal. Leaf size=35

$$\frac{1}{3}bf^a \log(f)\text{Ei}\left(bx^3 \log(f)\right) - \frac{f^{a+bx^3}}{3x^3}$$

```
[Out] -1/3*f^(b*x^3+a)/x^3+1/3*b*f^a*Ei(b*x^3*ln(f))*ln(f)
```

Rubi [A] time = 0.04, antiderivative size = 35, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2214, 2210}

$$\frac{1}{3}bf^a \log(f)\text{Ei}\left(bx^3 \log(f)\right) - \frac{f^{a+bx^3}}{3x^3}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^3)/x^4,x]
```

```
[Out] -f^(a + b*x^3)/(3*x^3) + (b*f^a*ExpIntegralEi[b*x^3*Log[f]]*Log[f])/3
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\begin{aligned} \int \frac{f^{a+bx^3}}{x^4} dx &= -\frac{f^{a+bx^3}}{3x^3} + (b \log(f)) \int \frac{f^{a+bx^3}}{x} dx \\ &= -\frac{f^{a+bx^3}}{3x^3} + \frac{1}{3}bf^a\text{Ei}\left(bx^3 \log(f)\right) \log(f) \end{aligned}$$

Mathematica [A] time = 0.01, size = 32, normalized size = 0.91

$$\frac{1}{3}f^a\left(b\log(f)\text{Ei}\left(bx^3\log(f)\right)-\frac{f^{bx^3}}{x^3}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^3)/x^4,x]
[Out] (f^a*(-(f^(b*x^3)/x^3) + b*ExpIntegralEi[b*x^3*Log[f]]*Log[f]))/3
```

fricas [A] time = 0.41, size = 35, normalized size = 1.00

$$\frac{bf^ax^3\text{Ei}\left(bx^3\log(f)\right)\log(f)-f^{bx^3+a}}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)/x^4,x, algorithm="fricas")
[Out] 1/3*(b*f^a*x^3*Ei(b*x^3*log(f))*log(f) - f^(b*x^3 + a))/x^3
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{f^{bx^3+a}}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)/x^4,x, algorithm="giac")
[Out] integrate(f^(b*x^3 + a)/x^4, x)
```

maple [B] time = 0.05, size = 97, normalized size = 2.77

$$-\frac{\left(\text{Ei}\left(1,-b\,x^3\ln(f)\right)-3\ln(x)-\ln(-b)+\ln\left(-b\,x^3\ln(f)\right)-\ln\left(\ln(f)\right)+\frac{e^{b\,x^3\ln(f)}}{b\,x^3\ln(f)}-\frac{2b\,x^3\ln(f)+2}{2b\,x^3\ln(f)}+\frac{1}{b\,x^3\ln(f)}+1\right)b\,f}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^3+a)/x^4,x)
[Out] -1/3*f^a*b*ln(f)*(-1/2/b/x^3/ln(f)*(2+2*b*x^3*ln(f))+1/b/x^3/ln(f)*exp(b*x^
3*ln(f))+ln(-b*x^3*ln(f))+Ei(1,-b*x^3*ln(f))+1-3*ln(x)-ln(-b)-ln(ln(f))+1/x
^3/b/ln(f))
```

maxima [**A**] time = 1.36, size = 18, normalized size = 0.51

$$\frac{1}{3}\,bf^{a}\Gamma\left(-1,-bx^{3}\log\left(f\right)\right)\log\left(f\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)/x^4,x, algorithm="maxima")
[Out] 1/3*b*f^a*gamma(-1, -b*x^3*log(f))*log(f)
```

mupad [**B**] time = 3.53, size = 32, normalized size = 0.91

$$-\frac{f^{a}\,\left(f^{b\,x^{3}}+b\,x^{3}\,\ln(f)\,\mathrm{expint}\left(-b\,x^{3}\,\ln(f)\right)\right)}{3\,x^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^3)/x^4,x)
[Out] -(f^a*(f^(b*x^3) + b*x^3*log(f)*expint(-b*x^3*log(f))))/(3*x^3)
```

sympy [**F**] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{f^{a+bx^{3}}}{x^{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**3+a)/x**4,x)
[Out] Integral(f**(a + b*x**3)/x**4, x)
```

3.104 $\int \frac{f^{a+bx^3}}{x^7} dx$

Optimal. Leaf size=58

$$\frac{1}{6}b^2 f^a \log^2(f)\text{Ei}\left(bx^3 \log(f)\right) - \frac{b\log(f)f^{a+bx^3}}{6x^3} - \frac{f^{a+bx^3}}{6x^6}$$

```
[Out] -1/6*f^(b*x^3+a)/x^6-1/6*b*f^(b*x^3+a)*ln(f)/x^3+1/6*b^2*f^a*Ei(b*x^3*ln(f)
)*ln(f)^2
```

Rubi [A] time = 0.07, antiderivative size = 58, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2214, 2210}

$$\frac{1}{6}b^2 f^a \log^2(f)\text{Ei}\left(bx^3 \log(f)\right) - \frac{f^{a+bx^3}}{6x^6} - \frac{b\log(f)f^{a+bx^3}}{6x^3}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^3)/x^7,x]
```

```
[Out] -f^(a + b*x^3)/(6*x^6) - (b*f^(a + b*x^3)*Log[f])/(6*x^3) + (b^2*f^a*ExpInt
egralEi[b*x^3*Log[f]]*Log[f]^2)/6
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\begin{aligned}\int \frac{f^{a+bx^3}}{x^7}\,dx &= -\frac{f^{a+bx^3}}{6x^6} + \frac{1}{2}(b\log(f))\int \frac{f^{a+bx^3}}{x^4}\,dx \\ &= -\frac{f^{a+bx^3}}{6x^6} - \frac{bf^{a+bx^3}\log(f)}{6x^3} + \frac{1}{2}\left(b^2\log^2(f)\right)\int \frac{f^{a+bx^3}}{x}\,dx \\ &= -\frac{f^{a+bx^3}}{6x^6} - \frac{bf^{a+bx^3}\log(f)}{6x^3} + \frac{1}{6}b^2 f^a \text{Ei}\left(bx^3\log(f)\right)\log^2(f)\end{aligned}$$

Mathematica [A] time = 0.02, size = 48, normalized size = 0.83

$$\frac{f^a\left(b^2x^6\log^2(f)\text{Ei}\left(bx^3\log(f)\right) - f^{bx^3}\left(bx^3\log(f)+1\right)\right)}{6x^6}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^3)/x^7,x]
```

```
[Out] (f^a*(b^2*x^6*ExpIntegralEi[b*x^3*Log[f]]*Log[f]^2 - f^(b*x^3)*(1 + b*x^3*L
og[f])))/(6*x^6)
```

fricas [A] time = 0.41, size = 48, normalized size = 0.83

$$\frac{b^2f^ax^6\text{Ei}\left(bx^3\log(f)\right)\log(f)^2 - \left(bx^3\log(f)+1\right)f^{bx^3+a}}{6\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)/x^7,x, algorithm="fricas")
```

```
[Out] 1/6*(b^2*f^a*x^6*Ei(b*x^3*log(f))*log(f)^2 - (b*x^3*log(f) + 1)*f^(b*x^3 +
a))/x^6
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{bx^3+a}}{x^7}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)/x^7,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^3 + a)/x^7, x)
```

maple [B] time = 0.06, size = 141, normalized size = 2.43

$$\frac{\left(-\frac{\mathrm{Ei}\left(1,-b\,x^{3}\ln(f)\right)}{2}+\frac{3\ln(x)}{2}+\frac{\ln(-b)}{2}-\frac{\ln\left(-b\,x^{3}\ln(f)\right)}{2}+\frac{\ln\left(\ln(f)\right)}{2}-\frac{1}{b\,x^{3}\ln(f)}-\frac{\left(3b\,x^{3}\ln(f)+3\right)\mathrm{e}^{b\,x^{3}\ln(f)}}{6b^{2}x^{6}\ln(f)^{2}}+\frac{9b^{2}x^{6}\ln(f)^{2}+12b\,x^{3}\ln(f)+6}{12b^{2}x^{6}\ln(f)^{2}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^3+a)/x^7,x)
```

```
[Out] 1/3*f^a*b^2*ln(f)^2*(1/12/b^2/x^6/ln(f)^2*(9*b^2*x^6*ln(f)^2+12*b*x^3*ln(f)
+6)-1/6/b^2/x^6/ln(f)^2*(3+3*b*x^3*ln(f))*exp(b*x^3*ln(f))-1/2*ln(-b*x^3*ln
(f))-1/2*Ei(1,-b*x^3*ln(f))-3/4+3/2*ln(x)+1/2*ln(-b)+1/2*ln(ln(f))-1/2/x^6/
b^2/ln(f)^2-1/b/x^3/ln(f))
```

maxima [A] time = 1.19, size = 22, normalized size = 0.38

$$-\frac{1}{3}\,b^{2}f^{a}\Gamma\left(-2,-bx^{3}\log(f)\right)\log(f)^{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)/x^7,x, algorithm="maxima")
```

```
[Out] -1/3*b^2*f^a*gamma(-2, -b*x^3*log(f))*log(f)^2
```

mupad [B] time = 3.32, size = 57, normalized size = 0.98

$$-\frac{b^{2}\,f^{a}\ln(f)^{2}\,\left(f^{b\,x^{3}}\,\left(\frac{1}{2\,b\,x^{3}\,\ln(f)}+\frac{1}{2\,b^{2}\,x^{6}\ln(f)^{2}}\right)+\frac{\mathrm{expint}\left(-b\,x^{3}\,\ln(f)\right)}{2}\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^3)/x^7,x)
```

```
[Out] -(b^2*f^a*log(f)^2*(f^(b*x^3)*(1/(2*b*x^3*log(f)) + 1/(2*b^2*x^6*log(f)^2))
 + expint(-b*x^3*log(f))/2))/3
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{f^{a+bx^{3}}}{x^{7}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**3+a)/x**7,x)
```

```
[Out] Integral(f**(a + b*x**3)/x**7, x)
```

3.105 $\int \frac{f^{a+bx^3}}{x^{10}} dx$

Optimal. Leaf size=81

$$\frac{1}{18}b^3 f^a \log^3(f)\text{Ei}\left(bx^3\log(f)\right) - \frac{b^2\log^2(f)f^{a+bx^3}}{18x^3} - \frac{f^{a+bx^3}}{9x^9} - \frac{b\log(f)f^{a+bx^3}}{18x^6}$$

```
[Out] -1/9*f^(b*x^3+a)/x^9-1/18*b*f^(b*x^3+a)*ln(f)/x^6-1/18*b^2*f^(b*x^3+a)*ln(f
)^2/x^3+1/18*b^3*f^a*Ei(b*x^3*ln(f))*ln(f)^3
```

Rubi [A] time = 0.09, antiderivative size = 81, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2214, 2210}

$$\frac{1}{18}b^3 f^a \log^3(f)\text{Ei}\left(bx^3\log(f)\right) - \frac{b^2\log^2(f)f^{a+bx^3}}{18x^3} - \frac{f^{a+bx^3}}{9x^9} - \frac{b\log(f)f^{a+bx^3}}{18x^6}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^3)/x^10,x]
```

```
[Out] -f^(a + b*x^3)/(9*x^9) - (b*f^(a + b*x^3)*Log[f])/(18*x^6) - (b^2*f^(a + b*
x^3)*Log[f]^2)/(18*x^3) + (b^3*f^a*ExpIntegralEi[b*x^3*Log[f]]*Log[f]^3)/18
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\begin{aligned}\int \frac{f^{a+bx^3}}{x^{10}}\,dx &= -\frac{f^{a+bx^3}}{9x^9}+\frac{1}{3}(b\log(f))\int \frac{f^{a+bx^3}}{x^7}\,dx\\ &= -\frac{f^{a+bx^3}}{9x^9}-\frac{bf^{a+bx^3}\log(f)}{18x^6}+\frac{1}{6}\left(b^2\log^2(f)\right)\int \frac{f^{a+bx^3}}{x^4}\,dx\\ &= -\frac{f^{a+bx^3}}{9x^9}-\frac{bf^{a+bx^3}\log(f)}{18x^6}-\frac{b^2f^{a+bx^3}\log^2(f)}{18x^3}+\frac{1}{6}\left(b^3\log^3(f)\right)\int \frac{f^{a+bx^3}}{x}\,dx\\ &= -\frac{f^{a+bx^3}}{9x^9}-\frac{bf^{a+bx^3}\log(f)}{18x^6}-\frac{b^2f^{a+bx^3}\log^2(f)}{18x^3}+\frac{1}{18}b^3f^a\text{Ei}\left(bx^3\log(f)\right)\log^3(f)\end{aligned}$$

Mathematica [A] time = 0.02, size = 59, normalized size = 0.73

$$\frac{f^a\left(b^3x^9\log^3(f)\text{Ei}\left(bx^3\log(f)\right)-f^{bx^3}\left(b^2x^6\log^2(f)+bx^3\log(f)+2\right)\right)}{18x^9}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^3)/x^10,x]
```

```
[Out] (f^a*(b^3*x^9*ExpIntegralEi[b*x^3*Log[f]]*Log[f]^3 - f^(b*x^3)*(2 + b*x^3*L
og[f] + b^2*x^6*Log[f]^2)))/(18*x^9)
```

fricas [A] time = 0.40, size = 59, normalized size = 0.73

$$\frac{b^3f^ax^9\text{Ei}\left(bx^3\log(f)\right)\log(f)^3-\left(b^2x^6\log(f)^2+bx^3\log(f)+2\right)f^{bx^3+a}}{18\,x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)/x^10,x, algorithm="fricas")
```

```
[Out] 1/18*(b^3*f^a*x^9*Ei(b*x^3*log(f))*log(f)^3 - (b^2*x^6*log(f)^2 + b*x^3*log
(f) + 2)*f^(b*x^3 + a))/x^9
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{bx^3+a}}{x^{10}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)/x^10,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^3 + a)/x^10, x)
```

maple [B] time = 0.06, size = 177, normalized size = 2.19

$$-\frac{\frac{\mathrm{Ei}\left(1,-b\,x^{3}\ln\left(f\right)\right)}{6}-\frac{\ln\left(x\right)}{2}-\frac{\ln\left(-b\right)}{6}+\frac{\ln\left(-b\,x^{3}\ln\left(f\right)\right)}{6}-\frac{\ln\left(\ln\left(f\right)\right)}{6}+\frac{1}{2b\,x^{3}\ln\left(f\right)}+\frac{1}{2b^{2}x^{6}\ln\left(f\right)^{2}}+\frac{\left(4b^{2}x^{6}\ln\left(f\right)^{2}+4b\,x^{3}\ln\left(f\right)+8\right)\mathrm{e}^{b\,x^{3}\ln\left(f\right)}}{24b^{3}x^{9}\ln\left(f\right)^{3}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^3+a)/x^10,x)
```

```
[Out] -1/3*f^a*b^3*ln(f)^3*(-1/72/b^3/x^9/ln(f)^3*(22*b^3*x^9*ln(f)^3+36*b^2*x^6*
ln(f)^2+36*b*x^3*ln(f)+24)+1/24/b^3/x^9/ln(f)^3*(4*b^2*x^6*ln(f)^2+4*b*x^3*
ln(f)+8)*exp(b*x^3*ln(f))+1/6*ln(-b*x^3*ln(f))+1/6*Ei(1,-b*x^3*ln(f))+11/36
-1/2*ln(x)-1/6*ln(-b)-1/6*ln(ln(f))+1/3/x^9/b^3/ln(f)^3+1/2/b^2/x^6/ln(f)^2
+1/2/b/x^3/ln(f))
```

maxima [A] time = 1.18, size = 22, normalized size = 0.27

$$\frac{1}{3}\,b^{3}f^{a}\Gamma\left(-3,-bx^{3}\log\left(f\right)\right)\log\left(f\right)^{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)/x^10,x, algorithm="maxima")
```

```
[Out] 1/3*b^3*f^a*gamma(-3, -b*x^3*log(f))*log(f)^3
```

mupad [B] time = 3.53, size = 69, normalized size = 0.85

$$-\frac{b^{3}\,f^{a}\ln\left(f\right)^{3}\,\left(f^{b\,x^{3}}\,\left(\frac{1}{6\,b\,x^{3}\,\ln\left(f\right)}+\frac{1}{6\,b^{2}\,x^{6}\ln\left(f\right)^{2}}+\frac{1}{3\,b^{3}\,x^{9}\ln\left(f\right)^{3}}\right)+\frac{\mathrm{expint}\left(-b\,x^{3}\,\ln\left(f\right)\right)}{6}\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^3)/x^10,x)
```

```
[Out] -(b^3*f^a*log(f)^3*(f^(b*x^3)*(1/(6*b*x^3*log(f)) + 1/(6*b^2*x^6*log(f)^2)
+ 1/(3*b^3*x^9*log(f)^3)) + expint(-b*x^3*log(f))/6))/3
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{f^{a+bx^{3}}}{x^{10}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**3+a)/x**10,x)
```

```
[Out] Integral(f**(a + b*x**3)/x**10, x)
```

3.106 $\int \frac{f^{a+bx^3}}{x^{13}} \, dx$

Optimal. Leaf size=24

$$-\frac{1}{3}b^4 f^a \log^4(f)\Gamma\left(-4,-bx^3\log(f)\right)$$

[Out] -1/3*f^a/x^12*Ei(5,-b*x^3*ln(f))

Rubi [A] time = 0.02, antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2218}

$$-\frac{1}{3}b^4 f^a \log^4(f)\text{Gamma}\left(-4,-bx^3\log(f)\right)$$

Antiderivative was successfully verified.

[In] Int[f^(a + b*x^3)/x^13,x]

[Out] -(b^4*f^a*Gamma[-4, -(b*x^3*Log[f])]*Log[f]^4)/3

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+bx^3}}{x^{13}} \, dx = -\frac{1}{3}b^4 f^a \Gamma\left(-4,-bx^3\log(f)\right)\log^4(f)$$

Mathematica [A] time = 0.00, size = 24, normalized size = 1.00

$$-\frac{1}{3}b^4 f^a \log^4(f)\Gamma\left(-4,-bx^3\log(f)\right)$$

Antiderivative was successfully verified.

[In] Integrate[f^(a + b*x^3)/x^13,x]

[Out] -1/3*(b^4*f^a*Gamma[-4, -(b*x^3*Log[f])]*Log[f]^4)

fricas [B] time = 0.40, size = 71, normalized size = 2.96

$$\frac{b^{4} f^{a} x^{12} \mathrm{Ei}\left(b x^{3} \log(f)\right) \log(f)^{4} - \left(b^{3} x^{9} \log(f)^{3} + b^{2} x^{6} \log(f)^{2} + 2 \, b x^{3} \log(f) + 6\right) f^{b x^{3} + a}}{72 \, x^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)/x^13,x, algorithm="fricas")
```

```
[Out] 1/72*(b^4*f^a*x^12*Ei(b*x^3*log(f))*log(f)^4 - (b^3*x^9*log(f)^3 + b^2*x^6*
log(f)^2 + 2*b*x^3*log(f) + 6)*f^(b*x^3 + a))/x^12
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{b x^{3} + a}}{x^{13}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)/x^13,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^3 + a)/x^13, x)
```

maple [B] time = 0.08, size = 213, normalized size = 8.88

$$\frac{\left(-\frac{\mathrm{Ei}\left(1,-b\,x^{3} \ln(f)\right)}{24}+\frac{\ln(x)}{8}+\frac{\ln(-b)}{24}-\frac{\ln\left(-b\,x^{3} \ln(f)\right)}{24}+\frac{\ln\left(\ln(f)\right)}{24}-\frac{1}{6 b\,x^{3} \ln(f)}-\frac{1}{4 b^{2} x^{6} \ln(f)^{2}}-\frac{1}{3 b^{3} x^{9} \ln(f)^{3}}-\frac{\left(5 b^{3} x^{9} \ln(f)^{3}+5 b^{2} x^{6} \ln \cdots\right.}{120 \cdots}\right.}{3 \cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^3+a)/x^13,x)
```

```
[Out] 1/3*f^a*b^4*ln(f)^4*(1/1440/b^4/x^12/ln(f)^4*(125*b^4*x^12*ln(f)^4+240*b^3*
x^9*ln(f)^3+360*b^2*x^6*ln(f)^2+480*b*x^3*ln(f)+360)-1/120/b^4/x^12/ln(f)^4
*(5*b^3*x^9*ln(f)^3+5*b^2*x^6*ln(f)^2+10*b*x^3*ln(f)+30)*exp(b*x^3*ln(f))-1
/24*ln(-b*x^3*ln(f))-1/24*Ei(1,-b*x^3*ln(f))-25/288+1/8*ln(x)+1/24*ln(-b)+1
/24*ln(ln(f))-1/4/x^12/b^4/ln(f)^4-1/3/b^3/x^9/ln(f)^3-1/4/b^2/x^6/ln(f)^2-
1/6/b/x^3/ln(f))
```

maxima [B] time = 1.14, size = 22, normalized size = 0.92

$$-\frac{1}{3} \, b^{4} f^{a} \Gamma\left(-4, -b x^{3} \log(f)\right) \log(f)^{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)/x^13,x, algorithm="maxima")
```

```
[Out] -1/3*b^4*f^a*gamma(-4, -b*x^3*log(f))*log(f)^4
```

mupad [B] time = 3.58, size = 90, normalized size = 3.75

$$-\frac{b^4\,f^a\,\ln(f)^4\,\mathrm{expint}\left(-b\,x^3\,\ln(f)\right)}{72}-\frac{b^4\,f^a\,f^{b\,x^3}\,\ln(f)^4\,\left(\frac{1}{24\,b\,x^3\,\ln(f)}+\frac{1}{24\,b^2\,x^6\,\ln(f)^2}+\frac{1}{12\,b^3\,x^9\,\ln(f)^3}+\frac{1}{4\,b^4\,x^{12}\,\ln(f)^4}\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^3)/x^13,x)
```

```
[Out] - (b^4*f^a*log(f)^4*expint(-b*x^3*log(f)))/72 - (b^4*f^a*f^(b*x^3)*log(f)^4
*(1/(24*b*x^3*log(f)) + 1/(24*b^2*x^6*log(f)^2) + 1/(12*b^3*x^9*log(f)^3) +
 1/(4*b^4*x^12*log(f)^4)))/3
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+bx^3}}{x^{13}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**3+a)/x**13,x)
```

```
[Out] Integral(f**(a + b*x**3)/x**13, x)
```

3.107 $\int \frac{f^{a+bx^3}}{x^{16}} \, dx$

Optimal. Leaf size=24

$$\frac{1}{3}b^5 f^a \log^5(f)\Gamma\left(-5, -bx^3 \log(f)\right)$$

```
[Out] -1/3*f^a/x^15*Ei(6,-b*x^3*ln(f))
```

Rubi [A] time = 0.02, antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2218}

$$\frac{1}{3}b^5 f^a \log^5(f)\text{Gamma}\left(-5, -bx^3 \log(f)\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^3)/x^16,x]
```

```
[Out] (b^5*f^a*Gamma[-5, -(b*x^3*Log[f])]*Log[f]^5)/3
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+bx^3}}{x^{16}} \, dx = \frac{1}{3}b^5 f^a \Gamma\left(-5, -bx^3 \log(f)\right) \log^5(f)$$

Mathematica [A] time = 0.00, size = 24, normalized size = 1.00

$$\frac{1}{3}b^5 f^a \log^5(f)\Gamma\left(-5, -bx^3 \log(f)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^3)/x^16,x]
```

```
[Out] (b^5*f^a*Gamma[-5, -(b*x^3*Log[f])]*Log[f]^5)/3
```

fricas [B] time = 0.40, size = 83, normalized size = 3.46

$$\frac{b^5 f^a x^{15} \mathrm{Ei}\left(bx^3 \log(f)\right) \log(f)^5 - \left(b^4 x^{12} \log(f)^4 + b^3 x^9 \log(f)^3 + 2\, b^2 x^6 \log(f)^2 + 6\, bx^3 \log(f) + 24\right) f^{bx^3+a}}{360\, x^{15}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)/x^16,x, algorithm="fricas")
```

```
[Out] 1/360*(b^5*f^a*x^15*Ei(b*x^3*log(f))*log(f)^5 - (b^4*x^12*log(f)^4 + b^3*x^
9*log(f)^3 + 2*b^2*x^6*log(f)^2 + 6*b*x^3*log(f) + 24)*f^(b*x^3 + a))/x^15
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{bx^3+a}}{x^{16}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)/x^16,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^3 + a)/x^16, x)
```

maple [B] time = 0.09, size = 249, normalized size = 10.38

$$-\frac{\left(\frac{\mathrm{Ei}\left(1,-b\,x^3 \ln(f)\right)}{120} - \frac{\ln(x)}{40} - \frac{\ln(-b)}{120} + \frac{\ln\left(-b\,x^3 \ln(f)\right)}{120} - \frac{\ln\left(\ln(f)\right)}{120} + \frac{1}{24 b\,x^3 \ln(f)} + \frac{1}{12 b^2 x^6 \ln(f)^2} + \frac{1}{6 b^3 x^9 \ln(f)^3} + \frac{1}{4 b^4 x^{12} \ln(f)^4} + \frac{(6b^4}{}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^3+a)/x^16,x)
```

```
[Out] -1/3*f^a*b^5*ln(f)^5*(-1/7200/b^5/x^15/ln(f)^5*(137*b^5*x^15*ln(f)^5+300*b^
4*x^12*ln(f)^4+600*b^3*x^9*ln(f)^3+1200*b^2*x^6*ln(f)^2+1800*b*x^3*ln(f)+14
40)+1/720/b^5/x^15/ln(f)^5*(6*b^4*x^12*ln(f)^4+6*b^3*x^9*ln(f)^3+12*b^2*x^6
*ln(f)^2+36*b*x^3*ln(f)+144)*exp(b*x^3*ln(f))+1/120*ln(-b*x^3*ln(f))+1/120*
Ei(1,-b*x^3*ln(f))+137/7200-1/40*ln(x)-1/120*ln(-b)-1/120*ln(ln(f))+1/5/x^1
5/b^5/ln(f)^5+1/4/b^4/x^12/ln(f)^4+1/6/b^3/x^9/ln(f)^3+1/12/b^2/x^6/ln(f)^2
+1/24/b/x^3/ln(f))
```

maxima [B] time = 1.29, size = 22, normalized size = 0.92

$$\frac{1}{3}\, b^5 f^a \Gamma\left(-5, -bx^3 \log(f)\right) \log(f)^5$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f^(b*x^3+a)/x^16,x, algorithm="maxima")

[Out] 1/3*b^5*f^a*gamma(-5, -b*x^3*log(f))*log(f)^5

mupad [B] time = 3.47, size = 102, normalized size = 4.25

$$-\frac{b^5 f^a \ln(f)^5 \operatorname{expint}\left(-b x^3 \ln(f)\right)}{360}-\frac{b^5 f^a f^{b x^3} \ln(f)^5 \left(\frac{1}{120 b x^3 \ln(f)}+\frac{1}{120 b^2 x^6 \ln(f)^2}+\frac{1}{60 b^3 x^9 \ln(f)^3}+\frac{1}{20 b^4 x^{12} \ln(f)^4}+\right.}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(f^(a + b*x^3)/x^16,x)

[Out] - (b^5*f^a*log(f)^5*expint(-b*x^3*log(f)))/360 - (b^5*f^a*f^(b*x^3)*log(f)^
5*(1/(120*b*x^3*log(f)) + 1/(120*b^2*x^6*log(f)^2) + 1/(60*b^3*x^9*log(f)^3
) + 1/(20*b^4*x^12*log(f)^4) + 1/(5*b^5*x^15*log(f)^5)))/3

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+bx^3}}{x^{16}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f**(b*x**3+a)/x**16,x)

[Out] Integral(f**(a + b*x**3)/x**16, x)

3.108 $\int f^{a+bx^3} x^4 \, dx$

Optimal. Leaf size=34

$$-\frac{x^5 f^a \Gamma\left(\frac{5}{3}, -bx^3 \log(f)\right)}{3\left(-bx^3 \log(f)\right)^{5/3}}$$

```
[Out] -1/3*f^a*x^5*GAMMA(5/3,-b*x^3*ln(f))/(-b*x^3*ln(f))^(5/3)
```

Rubi [A] time = 0.02, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2218}

$$-\frac{x^5 f^a \text{Gamma}\left(\frac{5}{3}, -bx^3 \log(f)\right)}{3\left(-bx^3 \log(f)\right)^{5/3}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^3)*x^4,x]
```

```
[Out] -(f^a*x^5*Gamma[5/3, -(b*x^3*Log[f])])/(3*(-(b*x^3*Log[f]))^(5/3))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+bx^3} x^4 \, dx = -\frac{f^a x^5 \Gamma\left(\frac{5}{3}, -bx^3 \log(f)\right)}{3\left(-bx^3 \log(f)\right)^{5/3}}$$

Mathematica [A] time = 0.01, size = 34, normalized size = 1.00

$$-\frac{x^5 f^a \Gamma\left(\frac{5}{3}, -bx^3 \log(f)\right)}{3\left(-bx^3 \log(f)\right)^{5/3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^3)*x^4,x]
```

```
[Out] -1/3*(f^a*x^5*Gamma[5/3, -(b*x^3*Log[f])])/(-(b*x^3*Log[f]))^(5/3)
```

fricas [A] time = 0.43, size = 49, normalized size = 1.44

$$\frac{3\,bf^{bx^3+a}x^2\log(f) - 2\,\left(-b\log(f)\right)^{\frac{1}{3}}f^a\Gamma\left(\frac{2}{3}, -bx^3\log(f)\right)}{9\,b^2\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^4,x, algorithm="fricas")
```

```
[Out] 1/9*(3*b*f^(b*x^3 + a)*x^2*log(f) - 2*(-b*log(f))^(1/3)*f^a*gamma(2/3, -b*x
^3*log(f)))/(b^2*log(f)^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{bx^3+a}x^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^4,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^3 + a)*x^4, x)
```

maple [B] time = 0.04, size = 106, normalized size = 3.12

$$\frac{\left(\frac{2(-b)^{\frac{5}{3}}x^2\Gamma\left(\frac{2}{3},-b\,x^3\ln(f)\right)\ln(f)^{\frac{2}{3}}}{3\left(-b\,x^3\ln(f)\right)^{\frac{2}{3}}b} + \frac{(-b)^{\frac{5}{3}}x^2\mathrm{e}^{b\,x^3\ln(f)}\ln(f)^{\frac{2}{3}}}{b} - \frac{2(-b)^{\frac{5}{3}}\Gamma\left(\frac{2}{3}\right)x^2\ln(f)^{\frac{2}{3}}}{3\left(-b\,x^3\ln(f)\right)^{\frac{2}{3}}b}\right)f^a}{3\,(-b)^{\frac{5}{3}}\ln(f)^{\frac{5}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^3+a)*x^4,x)
```

```
[Out] 1/3*f^a/(-b)^(5/3)/ln(f)^(5/3)*(-2/3*x^2*(-b)^(5/3)*ln(f)^(2/3)/b*GAMMA(2/3
)/(-b*x^3*ln(f))^(2/3)+x^2*(-b)^(5/3)*ln(f)^(2/3)/b*exp(b*x^3*ln(f))+2/3*x^
2*(-b)^(5/3)*ln(f)^(2/3)/b/(-b*x^3*ln(f))^(2/3)*GAMMA(2/3,-b*x^3*ln(f)))
```

maxima [A] time = 1.27, size = 28, normalized size = 0.82

$$-\frac{f^a x^5\Gamma\left(\frac{5}{3}, -bx^3\log(f)\right)}{3\,\left(-bx^3\log(f)\right)^{\frac{5}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^4,x, algorithm="maxima")
```

```
[Out] -1/3*f^a*x^5*gamma(5/3, -b*x^3*log(f))/(-b*x^3*log(f))^(5/3)
```

mupad [B] time = 3.56, size = 71, normalized size = 2.09

$$\frac{2 f^a x^5 \Gamma\left(\frac{2}{3}\right)}{9 \left(-b x^3 \ln(f)\right)^{5/3}} - \frac{2 f^a x^5 \Gamma\left(\frac{2}{3}, -b x^3 \ln(f)\right)}{9 \left(-b x^3 \ln(f)\right)^{5/3}} + \frac{f^a f^{b x^3} x^2}{3 b \ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^3)*x^4,x)
```

```
[Out] (2*f^a*x^5*gamma(2/3))/(9*(-b*x^3*log(f))^(5/3)) - (2*f^a*x^5*igamma(2/3, -
b*x^3*log(f)))/(9*(-b*x^3*log(f))^(5/3)) + (f^a*f^(b*x^3)*x^2)/(3*b*log(f))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+bx^3} x^4 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**3+a)*x**4,x)
```

```
[Out] Integral(f**(a + b*x**3)*x**4, x)
```

3.109 $\int f^{a+bx^3} x^3 \, dx$

Optimal. Leaf size=34

$$-\frac{x^4 f^a \Gamma\left(\frac{4}{3}, -bx^3 \log(f)\right)}{3\left(-bx^3 \log(f)\right)^{4/3}}$$

```
[Out] -1/3*f^a*x^4*GAMMA(4/3,-b*x^3*ln(f))/(-b*x^3*ln(f))^(4/3)
```

Rubi [A] time = 0.02, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2218}

$$-\frac{x^4 f^a \text{Gamma}\left(\frac{4}{3}, -bx^3 \log(f)\right)}{3\left(-bx^3 \log(f)\right)^{4/3}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^3)*x^3,x]
```

```
[Out] -(f^a*x^4*Gamma[4/3, -(b*x^3*Log[f])])/(3*(-(b*x^3*Log[f]))^(4/3))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+bx^3} x^3 \, dx = -\frac{f^a x^4 \Gamma\left(\frac{4}{3}, -bx^3 \log(f)\right)}{3\left(-bx^3 \log(f)\right)^{4/3}}$$

Mathematica [A] time = 0.01, size = 34, normalized size = 1.00

$$-\frac{x^4 f^a \Gamma\left(\frac{4}{3}, -bx^3 \log(f)\right)}{3\left(-bx^3 \log(f)\right)^{4/3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^3)*x^3,x]
```

```
[Out] -1/3*(f^a*x^4*Gamma[4/3, -(b*x^3*Log[f])])/(-(b*x^3*Log[f]))^(4/3)
```

fricas [A] time = 0.44, size = 47, normalized size = 1.38

$$\frac{3\,bf^{bx^3+a}x\log(f) - \left(-b\log(f)\right)^{\frac{2}{3}}f^a\Gamma\left(\frac{1}{3}, -bx^3\log(f)\right)}{9\,b^2\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^3,x, algorithm="fricas")
```

```
[Out] 1/9*(3*b*f^(b*x^3 + a)*x*log(f) - (-b*log(f))^(2/3)*f^a*gamma(1/3, -b*x^3*l
og(f)))/(b^2*log(f)^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{bx^3+a}x^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^3,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^3 + a)*x^3, x)
```

maple [B] time = 0.04, size = 109, normalized size = 3.21

$$-\frac{\left(\frac{(-b)^{\frac{4}{3}}x\Gamma\left(\frac{1}{3},-b\,x^3\ln(f)\right)\ln(f)^{\frac{1}{3}}}{3\left(-b\,x^3\ln(f)\right)^{\frac{1}{3}}b}+\frac{(-b)^{\frac{4}{3}}x\,\mathrm{e}^{b\,x^3\ln(f)}\ln(f)^{\frac{1}{3}}}{b}-\frac{2(-b)^{\frac{4}{3}}\pi\sqrt{3}\,x\ln(f)^{\frac{1}{3}}}{9\Gamma\left(\frac{2}{3}\right)\left(-b\,x^3\ln(f)\right)^{\frac{1}{3}}b}\right)f^a}{3\,(-b)^{\frac{1}{3}}\,b\ln(f)^{\frac{4}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^3+a)*x^3,x)
```

```
[Out] -1/3*f^a/b/ln(f)^(4/3)/(-b)^(1/3)*(-2/9*x*(-b)^(4/3)*ln(f)^(1/3)/b*Pi*3^(1/
2)/GAMMA(2/3)/(-b*x^3*ln(f))^(1/3)+x*(-b)^(4/3)*ln(f)^(1/3)/b*exp(b*x^3*ln(
f))+1/3*x*(-b)^(4/3)*ln(f)^(1/3)/b/(-b*x^3*ln(f))^(1/3)*GAMMA(1/3,-b*x^3*ln
(f)))
```

maxima [A] time = 1.33, size = 28, normalized size = 0.82

$$-\frac{f^a x^4 \Gamma\left(\frac{4}{3}, -bx^3 \log(f)\right)}{3\left(-bx^3 \log(f)\right)^{\frac{4}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x^3,x, algorithm="maxima")
```

```
[Out] -1/3*f^a*x^4*gamma(4/3, -b*x^3*log(f))/(-b*x^3*log(f))^(4/3)
```

mupad [B] time = 3.18, size = 75, normalized size = 2.21

$$\frac{f^a f^{b x^3} x}{3 b \ln(f)} - \frac{f^a x^4 \Gamma\left(\frac{1}{3}, -b x^3 \ln(f)\right)}{9\left(-b x^3 \ln(f)\right)^{4/3}} + \frac{2\pi\sqrt{3}\, f^a x^4}{27\,\Gamma\left(\frac{2}{3}\right)\left(-b x^3 \ln(f)\right)^{4/3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^3)*x^3,x)
```

```
[Out] (f^a*f^(b*x^3)*x)/(3*b*log(f)) - (f^a*x^4*igamma(1/3, -b*x^3*log(f)))/(9*(-
b*x^3*log(f))^(4/3)) + (2*3^(1/2)*f^a*x^4*pi)/(27*gamma(2/3)*(-b*x^3*log(f)
)^(4/3))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+bx^3} x^3\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**3+a)*x**3,x)
```

```
[Out] Integral(f**(a + b*x**3)*x**3, x)
```

3.110 $\int f^{a+bx^3} x \, dx$

Optimal. Leaf size=34

$$-\frac{x^2 f^a \Gamma\left(\frac{2}{3}, -bx^3 \log(f)\right)}{3\left(-bx^3 \log(f)\right)^{2/3}}$$

```
[Out] -1/3*f^a*x^2*GAMMA(2/3,-b*x^3*ln(f))/(-b*x^3*ln(f))^(2/3)
```

Rubi [A] time = 0.01, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {2218}

$$-\frac{x^2 f^a \text{Gamma}\left(\frac{2}{3}, -bx^3 \log(f)\right)}{3\left(-bx^3 \log(f)\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^3)*x,x]
```

```
[Out] -(f^a*x^2*Gamma[2/3, -(b*x^3*Log[f])])/(3*(-(b*x^3*Log[f]))^(2/3))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+bx^3} x \, dx = -\frac{f^a x^2 \Gamma\left(\frac{2}{3}, -bx^3 \log(f)\right)}{3\left(-bx^3 \log(f)\right)^{2/3}}$$

Mathematica [A] time = 0.01, size = 34, normalized size = 1.00

$$-\frac{x^2 f^a \Gamma\left(\frac{2}{3}, -bx^3 \log(f)\right)}{3\left(-bx^3 \log(f)\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^3)*x,x]
```

```
[Out] -1/3*(f^a*x^2*Gamma[2/3, -(b*x^3*Log[f])])/(-(b*x^3*Log[f]))^(2/3)
```

fricas [A] time = 0.42, size = 29, normalized size = 0.85

$$\frac{\left(-b\log(f)\right)^{\frac{1}{3}} f^{a}\Gamma\left(\frac{2}{3}, -bx^{3}\log(f)\right)}{3\,b\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x,x, algorithm="fricas")
```

```
[Out] 1/3*(-b*log(f))^(1/3)*f^a*gamma(2/3, -b*x^3*log(f))/(b*log(f))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{bx^{3}+a}x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^3 + a)*x, x)
```

maple [B] time = 0.03, size = 75, normalized size = 2.21

$$\frac{\left(-\frac{(-b)^{\frac{2}{3}} x^{2}\Gamma\left(\frac{2}{3}, -b\,x^{3}\ln(f)\right)\ln(f)^{\frac{2}{3}}}{\left(-b\,x^{3}\ln(f)\right)^{\frac{2}{3}}}+\frac{(-b)^{\frac{2}{3}}\Gamma\left(\frac{2}{3}\right)x^{2}\ln(f)^{\frac{2}{3}}}{\left(-b\,x^{3}\ln(f)\right)^{\frac{2}{3}}}\right)f^{a}}{3\,(-b)^{\frac{2}{3}}\ln(f)^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^3+a)*x,x)
```

```
[Out] 1/3*f^a/(-b)^(2/3)/ln(f)^(2/3)*(x^2*(-b)^(2/3)*ln(f)^(2/3)*GAMMA(2/3)/(-b*x
^3*ln(f))^(2/3)-x^2*(-b)^(2/3)*ln(f)^(2/3)/(-b*x^3*ln(f))^(2/3)*GAMMA(2/3,-
b*x^3*ln(f)))
```

maxima [A] time = 1.27, size = 28, normalized size = 0.82

$$-\frac{f^{a}x^{2}\Gamma\left(\frac{2}{3}, -bx^{3}\log(f)\right)}{3\left(-bx^{3}\log(f)\right)^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)*x,x, algorithm="maxima")
[Out] -1/3*f^a*x^2*gamma(2/3, -b*x^3*log(f))/(-b*x^3*log(f))^(2/3)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.03

$$\int f^{b\,x^3+a}\,x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^3)*x,x)
[Out] int(f^(a + b*x^3)*x, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+bx^3}x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**3+a)*x,x)
[Out] Integral(f**(a + b*x**3)*x, x)
```

3.111 $\int f^{a+bx^3}\,dx$

Optimal. Leaf size=32

$$-\frac{xf^a\Gamma\left(\frac{1}{3},-bx^3\log(f)\right)}{3\sqrt[3]{-bx^3\log(f)}}$$

```
[Out] -1/3*f^a*x*GAMMA(1/3,-b*x^3*ln(f))/(-b*x^3*ln(f))^(1/3)
```

Rubi [A] time = 0.00, antiderivative size = 32, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2208}

$$-\frac{xf^a\text{Gamma}\left(\frac{1}{3},-bx^3\log(f)\right)}{3\sqrt[3]{-bx^3\log(f)}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^3),x]
```

```
[Out] -(f^a*x*Gamma[1/3, -(b*x^3*Log[f])])/(3*(-(b*x^3*Log[f]))^(1/3))
```

Rule 2208

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> -Simp[(F^a
*(c + d*x)*Gamma[1/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x)^n*Log[F
]))^(1/n)), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rubi steps

$$\int f^{a+bx^3}\,dx=-\frac{f^ax\Gamma\left(\frac{1}{3},-bx^3\log(f)\right)}{3\sqrt[3]{-bx^3\log(f)}}$$

Mathematica [A] time = 0.00, size = 32, normalized size = 1.00

$$-\frac{xf^a\Gamma\left(\frac{1}{3},-bx^3\log(f)\right)}{3\sqrt[3]{-bx^3\log(f)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^3),x]
```

```
[Out] -1/3*(f^a*x*Gamma[1/3, -(b*x^3*Log[f])])/(-(b*x^3*Log[f]))^(1/3)
```

fricas [A] time = 0.42, size = 29, normalized size = 0.91

$$\frac{\left(-b\log(f)\right)^{\frac{2}{3}} f^a \Gamma\left(\frac{1}{3}, -bx^3\log(f)\right)}{3\, b\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a),x, algorithm="fricas")
```

```
[Out] 1/3*(-b*log(f))^(2/3)*f^a*gamma(1/3, -b*x^3*log(f))/(b*log(f))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{bx^3+a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a),x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^3 + a), x)
```

maple [B] time = 0.03, size = 78, normalized size = 2.44

$$\frac{\left(-\frac{(-b)^{\frac{1}{3}} x\Gamma\left(\frac{1}{3}, -b\, x^3\ln(f)\right)\ln(f)^{\frac{1}{3}}}{\left(-b\, x^3\ln(f)\right)^{\frac{1}{3}}} + \frac{2(-b)^{\frac{1}{3}}\pi\sqrt{3}\, x\ln(f)^{\frac{1}{3}}}{3\Gamma\left(\frac{2}{3}\right)\left(-b\, x^3\ln(f)\right)^{\frac{1}{3}}}\right) f^a}{3\,(-b)^{\frac{1}{3}}\ln(f)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^3+a),x)
```

```
[Out] 1/3*f^a/(-b)^(1/3)/ln(f)^(1/3)*(2/3*x*(-b)^(1/3)*ln(f)^(1/3)*Pi*3^(1/2)/GAM
MA(2/3)/(-b*x^3*ln(f))^(1/3)-x*(-b)^(1/3)*ln(f)^(1/3)/(-b*x^3*ln(f))^(1/3)*
GAMMA(1/3,-b*x^3*ln(f)))
```

maxima [A] time = 1.25, size = 26, normalized size = 0.81

$$-\frac{f^a x\Gamma\left(\frac{1}{3}, -bx^3\log(f)\right)}{3\,\left(-bx^3\log(f)\right)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a),x, algorithm="maxima")
[Out] -1/3*f^a*x*gamma(1/3, -b*x^3*log(f))/(-b*x^3*log(f))^(1/3)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.03

$$\int f^{b\,x^3+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^3),x)
[Out] int(f^(a + b*x^3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+bx^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**3+a),x)
[Out] Integral(f**(a + b*x**3), x)
```

3.112 $\int \frac{f^{a+bx^3}}{x^2}\,dx$

Optimal. Leaf size=34

$$-\frac{f^a\sqrt[3]{-bx^3\log(f)}\,\Gamma\left(-\frac{1}{3},-bx^3\log(f)\right)}{3x}$$

```
[Out] -1/3*f^a*GAMMA(-1/3,-b*x^3*ln(f))*(-b*x^3*ln(f))^(1/3)/x
```

Rubi [A] time = 0.02, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2218}

$$-\frac{f^a\sqrt[3]{-bx^3\log(f)}\,\text{Gamma}\left(-\frac{1}{3},-bx^3\log(f)\right)}{3x}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^3)/x^2,x]
```

```
[Out] -(f^a*Gamma[-1/3, -(b*x^3*Log[f])]*(-(b*x^3*Log[f]))^(1/3))/(3*x)
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+bx^3}}{x^2}\,dx = -\frac{f^a\Gamma\left(-\frac{1}{3},-bx^3\log(f)\right)\sqrt[3]{-bx^3\log(f)}}{3x}$$

Mathematica [A] time = 0.00, size = 34, normalized size = 1.00

$$-\frac{f^a\sqrt[3]{-bx^3\log(f)}\,\Gamma\left(-\frac{1}{3},-bx^3\log(f)\right)}{3x}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^3)/x^2,x]
[Out] -1/3*(f^a*Gamma[-1/3, -(b*x^3*Log[f])]*(-(b*x^3*Log[f]))^(1/3))/x
```

fricas [A] time = 0.44, size = 38, normalized size = 1.12

$$\frac{\left(-b\log(f)\right)^{\frac{1}{3}} f^a x\Gamma\left(\frac{2}{3}, -bx^3\log(f)\right) - f^{bx^3+a}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)/x^2,x, algorithm="fricas")
[Out] ((-b*log(f))^(1/3)*f^a*x*gamma(2/3, -b*x^3*log(f)) - f^(b*x^3 + a))/x
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{bx^3+a}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)/x^2,x, algorithm="giac")
[Out] integrate(f^(b*x^3 + a)/x^2, x)
```

maple [B] time = 0.04, size = 100, normalized size = 2.94

$$\frac{(-b)^{\frac{1}{3}}\left(-\frac{3b\,x^2\Gamma\left(\frac{2}{3},-b\,x^3\ln(f)\right)\ln(f)^{\frac{2}{3}}}{(-b)^{\frac{1}{3}}\left(-b\,x^3\ln(f)\right)^{\frac{2}{3}}}+\frac{3\Gamma\left(\frac{2}{3}\right)b\,x^2\ln(f)^{\frac{2}{3}}}{(-b)^{\frac{1}{3}}\left(-b\,x^3\ln(f)\right)^{\frac{2}{3}}}-\frac{3\,e^{b\,x^3\ln(f)}}{(-b)^{\frac{1}{3}}x\ln(f)^{\frac{1}{3}}}\right)f^a\ln(f)^{\frac{1}{3}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^3+a)/x^2,x)
[Out] 1/3*f^a*(-b)^(1/3)*ln(f)^(1/3)*(3*x^2/(-b)^(1/3)*ln(f)^(2/3)*b*GAMMA(2/3)/(
-b*x^3*ln(f))^(2/3)-3/x/(-b)^(1/3)/ln(f)^(1/3)*exp(b*x^3*ln(f))-3*x^2/(-b)^
(1/3)*ln(f)^(2/3)*b/(-b*x^3*ln(f))^(2/3)*GAMMA(2/3,-b*x^3*ln(f)))
```

maxima [A] time = 1.29, size = 28, normalized size = 0.82

$$-\frac{\left(-bx^3\log(f)\right)^{\frac{1}{3}} f^a\Gamma\left(-\frac{1}{3}, -bx^3\log(f)\right)}{3\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)/x^2,x, algorithm="maxima")
```

```
[Out] -1/3*(-b*x^3*log(f))^(1/3)*f^a*gamma(-1/3, -b*x^3*log(f))/x
```

mupad [B] time = 3.47, size = 63, normalized size = 1.85

$$\frac{f^a\,\Gamma\left(\frac{2}{3},-b\,x^3\,\ln(f)\right)\,\left(-b\,x^3\,\ln(f)\right)^{1/3}}{x}-\frac{f^a\,\Gamma\left(\frac{2}{3}\right)\,\left(-b\,x^3\,\ln(f)\right)^{1/3}}{x}-\frac{f^a\,f^{b\,x^3}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^3)/x^2,x)
```

```
[Out] (f^a*igamma(2/3, -b*x^3*log(f))*(-b*x^3*log(f))^(1/3))/x - (f^a*gamma(2/3)*
(-b*x^3*log(f))^(1/3))/x - (f^a*f^(b*x^3))/x
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{f^{a+bx^3}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**3+a)/x**2,x)
```

```
[Out] Integral(f**(a + b*x**3)/x**2, x)
```

3.113 $\int \frac{f^{a+bx^3}}{x^3} dx$

Optimal. Leaf size=34

$$-\frac{f^a \left(-bx^3 \log(f)\right)^{2/3} \Gamma\left(-\frac{2}{3}, -bx^3 \log(f)\right)}{3x^2}$$

```
[Out] -1/3*f^a*GAMMA(-2/3,-b*x^3*ln(f))*(-b*x^3*ln(f))^(2/3)/x^2
```

Rubi [A] time = 0.02, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2218}

$$-\frac{f^a \left(-bx^3 \log(f)\right)^{2/3} \text{Gamma}\left(-\frac{2}{3}, -bx^3 \log(f)\right)}{3x^2}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^3)/x^3,x]
```

```
[Out] -(f^a*Gamma[-2/3, -(b*x^3*Log[f])]*(-(b*x^3*Log[f]))^(2/3))/(3*x^2)
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+bx^3}}{x^3} dx = -\frac{f^a \Gamma\left(-\frac{2}{3}, -bx^3 \log(f)\right) \left(-bx^3 \log(f)\right)^{2/3}}{3x^2}$$

Mathematica [A] time = 0.00, size = 34, normalized size = 1.00

$$-\frac{f^a \left(-bx^3 \log(f)\right)^{2/3} \Gamma\left(-\frac{2}{3}, -bx^3 \log(f)\right)}{3x^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^3)/x^3,x]
```

```
[Out] -1/3*(f^a*Gamma[-2/3, -(b*x^3*Log[f])]*(-(b*x^3*Log[f]))^(2/3))/x^2
```

fricas [A] time = 0.45, size = 41, normalized size = 1.21

$$\frac{\left(-b\log(f)\right)^{\frac{2}{3}} f^{a} x^{2} \Gamma\left(\frac{1}{3}, -bx^{3}\log(f)\right) - f^{bx^{3}+a}}{2\,x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)/x^3,x, algorithm="fricas")
```

```
[Out] 1/2*((-b*log(f))^(2/3)*f^a*x^2*gamma(1/3, -b*x^3*log(f)) - f^(b*x^3 + a))/x
^2
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{bx^{3}+a}}{x^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)/x^3,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^3 + a)/x^3, x)
```

maple [B] time = 0.04, size = 102, normalized size = 3.00

$$-\frac{\left(-\frac{3bx\Gamma\left(\frac{1}{3},-b\,x^{3}\ln(f)\right)\ln(f)^{\frac{1}{3}}}{2(-b)^{\frac{2}{3}}\left(-b\,x^{3}\ln(f)\right)^{\frac{1}{3}}}+\frac{\pi\sqrt{3}\,bx\ln(f)^{\frac{1}{3}}}{(-b)^{\frac{2}{3}}\Gamma\left(\frac{2}{3}\right)\left(-b\,x^{3}\ln(f)\right)^{\frac{1}{3}}}-\frac{3\,\mathrm{e}^{b\,x^{3}\ln(f)}}{2(-b)^{\frac{2}{3}}x^{2}\ln(f)^{\frac{2}{3}}}\right)b\,f^{a}\ln(f)^{\frac{2}{3}}}{3\,(-b)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^3+a)/x^3,x)
```

```
[Out] -1/3*f^a*b*ln(f)^(2/3)/(-b)^(1/3)*(x/(-b)^(2/3)*ln(f)^(1/3)*b*Pi*3^(1/2)/GA
MMA(2/3)/(-b*x^3*ln(f))^(1/3)-3/2/x^2/(-b)^(2/3)/ln(f)^(2/3)*exp(b*x^3*ln(f
))-3/2*x/(-b)^(2/3)*ln(f)^(1/3)*b/(-b*x^3*ln(f))^(1/3)*GAMMA(1/3,-b*x^3*ln(
f)))
```

maxima [A] time = 1.65, size = 28, normalized size = 0.82

$$-\frac{\left(-bx^{3}\log(f)\right)^{\frac{2}{3}} f^{a}\Gamma\left(-\frac{2}{3}, -bx^{3}\log(f)\right)}{3\,x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(b*x^3+a)/x^3,x, algorithm="maxima")
```

```
[Out] -1/3*(-b*x^3*log(f))^(2/3)*f^a*gamma(-2/3, -b*x^3*log(f))/x^2
```

mupad [B] time = 3.58, size = 70, normalized size = 2.06

$$\frac{f^a\,\Gamma\left(\frac{1}{3},-b\,x^3\,\ln(f)\right)\,\left(-b\,x^3\,\ln(f)\right)^{2/3}}{2\,x^2}-\frac{f^a\,f^{b\,x^3}}{2\,x^2}-\frac{\pi\,\sqrt{3}\,f^a\,\left(-b\,x^3\,\ln(f)\right)^{2/3}}{3\,x^2\,\Gamma\left(\frac{2}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^3)/x^3,x)
```

```
[Out] (f^a*igamma(1/3, -b*x^3*log(f))*(-b*x^3*log(f))^(2/3))/(2*x^2) - (f^a*f^(b*
x^3))/(2*x^2) - (3^(1/2)*f^a*pi*(-b*x^3*log(f))^(2/3))/(3*x^2*gamma(2/3))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+bx^3}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(b*x**3+a)/x**3,x)
```

```
[Out] Integral(f**(a + b*x**3)/x**3, x)
```

3.114 $\int e^{4x^3} x^2 \, dx$

Optimal. Leaf size=11

$$\frac{e^{4x^3}}{12}$$

```
[Out] 1/12*exp(4*x^3)
```

Rubi [A] time = 0.01, antiderivative size = 11, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {2209}

$$\frac{e^{4x^3}}{12}$$

Antiderivative was successfully verified.

```
[In] Int[E^(4*x^3)*x^2,x]
```

```
[Out] E^(4*x^3)/12
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rubi steps

$$\int e^{4x^3} x^2 \, dx = \frac{e^{4x^3}}{12}$$

Mathematica [A] time = 0.00, size = 11, normalized size = 1.00

$$\frac{e^{4x^3}}{12}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(4*x^3)*x^2,x]
```

```
[Out] E^(4*x^3)/12
```

fricas [A] time = 0.40, size = 8, normalized size = 0.73

$$\frac{1}{12}\, e^{\left(4\, x^{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x^3)*x^2,x, algorithm="fricas")
```

```
[Out] 1/12*e^(4*x^3)
```

giac [A] time = 0.21, size = 8, normalized size = 0.73

$$\frac{1}{12}\, e^{\left(4\, x^{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x^3)*x^2,x, algorithm="giac")
```

```
[Out] 1/12*e^(4*x^3)
```

maple [A] time = 0.00, size = 9, normalized size = 0.82

$$\frac{{\mathrm e}^{4 x^{3}}}{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(4*x^3)*x^2,x)
```

```
[Out] 1/12*exp(4*x^3)
```

maxima [A] time = 1.09, size = 8, normalized size = 0.73

$$\frac{1}{12}\, e^{\left(4\, x^{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x^3)*x^2,x, algorithm="maxima")
```

```
[Out] 1/12*e^(4*x^3)
```

mupad [B] time = 0.04, size = 8, normalized size = 0.73

$$\frac{{\mathrm{e}}^{4\,x^3}}{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*exp(4*x^3),x)
```

```
[Out] exp(4*x^3)/12
```

sympy [A] time = 0.09, size = 7, normalized size = 0.64

$$\frac{e^{4x^3}}{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x**3)*x**2,x)
```

```
[Out] exp(4*x**3)/12
```

3.115 $\int f^{a+\frac{b}{x}} x^m \, dx$

Optimal. Leaf size=35

$$f^a x^{m+1} \left(-\frac{b \log(f)}{x}\right)^{m+1} \Gamma\left(-m-1, -\frac{b \log(f)}{x}\right)$$

```
[Out] f^a*x^(1+m)*GAMMA(-1-m,-b*ln(f)/x)*(-b*ln(f)/x)^(1+m)
```

Rubi [A] time = 0.02, antiderivative size = 35, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2218}

$$f^a x^{m+1} \left(-\frac{b \log(f)}{x}\right)^{m+1} \text{Gamma}\left(-m-1, -\frac{b \log(f)}{x}\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x)*x^m,x]
```

```
[Out] f^a*x^(1 + m)*Gamma[-1 - m, -((b*Log[f])/x)]*(-((b*Log[f])/x))^(1 + m)
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+\frac{b}{x}} x^m \, dx = f^a x^{1+m} \Gamma\left(-1-m, -\frac{b \log(f)}{x}\right) \left(-\frac{b \log(f)}{x}\right)^{1+m}$$

Mathematica [A] time = 0.01, size = 35, normalized size = 1.00

$$f^a x^{m+1} \left(-\frac{b \log(f)}{x}\right)^{m+1} \Gamma\left(-m-1, -\frac{b \log(f)}{x}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x)*x^m,x]
```

```
[Out] f^a*x^(1 + m)*Gamma[-1 - m, -((b*Log[f])/x)]*(-((b*Log[f])/x))^(1 + m)
```

fricas [F] time = 0.40, size = 0, normalized size = 0.00

$$\text{integral}\left(f^{\frac{ax+b}{x}}x^m, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)*x^m,x, algorithm="fricas")
```

```
[Out] integral(f^((a*x + b)/x)*x^m, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x}}x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)*x^m,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x)*x^m, x)
```

maple [B] time = 0.06, size = 136, normalized size = 3.89

$$\left(-\frac{x^m(-b)^{-m}\left(-\frac{b\ln(f)}{x}\right)^m\ln(f)^{-m}\Gamma(-m)}{m+1}+\frac{x^m(-b)^{-m}\left(-\frac{b\ln(f)}{x}\right)^m\ln(f)^{-m}\Gamma\left(-m,-\frac{b\ln(f)}{x}\right)}{m+1}+\frac{x^{m+1}(-b)^{-m}\ln(f)^{-m-1}}{(m+1)b}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x)*x^m,x)
```

```
[Out] f^a*(-b)^m*ln(f)^(m+1)*b*(-1/(m+1)*x^m*(-b)^(-m)*ln(f)^(-m)*GAMMA(-m)*(-b*l
n(f)/x)^m+1/(m+1)*x^(m+1)*(-b)^(-m)*ln(f)^(-m-1)/b*exp(b*ln(f)/x)+1/(m+1)*x
^m*(-b)^(-m)*ln(f)^(-m)*(-b*ln(f)/x)^m*GAMMA(-m,-b*ln(f)/x))
```

maxima [A] time = 1.61, size = 35, normalized size = 1.00

$$f^a x^{m+1}\left(-\frac{b\log(f)}{x}\right)^{m+1}\Gamma\left(-m-1,-\frac{b\log(f)}{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)*x^m,x, algorithm="maxima")
```

```
[Out] f^a*x^(m + 1)*(-b*log(f)/x)^(m + 1)*gamma(-m - 1, -b*log(f)/x)
```

mupad [B] time = 3.50, size = 52, normalized size = 1.49

$$\frac{f^a\,x^{m+1}\,\mathrm{e}^{\frac{b\,\ln(f)}{2\,x}}\,\mathrm{M}_{\frac{m}{2}+1,-\frac{m}{2}-\frac{1}{2}}\left(\frac{b\,\ln(f)}{x}\right)\,\left(\frac{b\,\ln(f)}{x}\right)^{m/2}}{m+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x)*x^m,x)
```

```
[Out] (f^a*x^(m + 1)*exp((b*log(f))/(2*x))*whittakerM(m/2 + 1, - m/2 - 1/2, (b*lo
g(f))/x)*((b*log(f))/x)^(m/2))/(m + 1)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x}}x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x)*x**m,x)
```

```
[Out] Integral(f**(a + b/x)*x**m, x)
```

3.116 $\int f^{a+\frac{b}{x}} x^4 \, dx$

Optimal. Leaf size=22

$$-b^5 f^a \log^5(f)\Gamma\left(-5,-\frac{b\log(f)}{x}\right)$$

[Out] f^a*x^5*Ei(6,-b*ln(f)/x)

Rubi [A] time = 0.02, antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2218}

$$-b^5 f^a \log^5(f)\text{Gamma}\left(-5,-\frac{b\log(f)}{x}\right)$$

Antiderivative was successfully verified.

[In] Int[f^(a + b/x)*x^4,x]

[Out] -(b^5*f^a*Gamma[-5, -((b*Log[f])/x)]*Log[f]^5)

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+\frac{b}{x}} x^4 \, dx = -b^5 f^a \Gamma\left(-5,-\frac{b\log(f)}{x}\right)\log^5(f)$$

Mathematica [A] time = 0.00, size = 22, normalized size = 1.00

$$-b^5 f^a \log^5(f)\Gamma\left(-5,-\frac{b\log(f)}{x}\right)$$

Antiderivative was successfully verified.

[In] Integrate[f^(a + b/x)*x^4,x]

[Out] -(b^5*f^a*Gamma[-5, -((b*Log[f])/x)]*Log[f]^5)

fricas [B] time = 0.42, size = 80, normalized size = 3.64

$$-\frac{1}{120}\,b^5f^a\mathrm{Ei}\left(\frac{b\log(f)}{x}\right)\log(f)^5+\frac{1}{120}\left(b^4x\log(f)^4+b^3x^2\log(f)^3+2\,b^2x^3\log(f)^2+6\,bx^4\log(f)+24\,x^5\right)f^{\frac{ax+b}{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)*x^4,x, algorithm="fricas")
```

```
[Out] -1/120*b^5*f^a*Ei(b*log(f)/x)*log(f)^5 + 1/120*(b^4*x*log(f)^4 + b^3*x^2*lo
g(f)^3 + 2*b^2*x^3*log(f)^2 + 6*b*x^4*log(f) + 24*x^5)*f^((a*x + b)/x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x}}x^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)*x^4,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x)*x^4, x)
```

maple [B] time = 0.11, size = 121, normalized size = 5.50

$$\frac{b^5f^a\,\mathrm{Ei}\left(1,-\frac{b\ln(f)}{x}\right)\ln(f)^5}{120}+\frac{b^4x\,f^af^{\frac{b}{x}}\ln(f)^4}{120}+\frac{b^3x^2f^af^{\frac{b}{x}}\ln(f)^3}{120}+\frac{b^2x^3f^af^{\frac{b}{x}}\ln(f)^2}{60}+\frac{b\,x^4f^af^{\frac{b}{x}}\ln(f)}{20}+\frac{x^5f^af^{\frac{b}{x}}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x)*x^4,x)
```

```
[Out] 1/5*f^a*f^(b/x)*x^5+1/20*b*ln(f)*f^a*f^(b/x)*x^4+1/60*b^2*ln(f)^2*f^a*f^(b/
x)*x^3+1/120*b^3*ln(f)^3*f^a*f^(b/x)*x^2+1/120*b^4*ln(f)^4*f^a*f^(b/x)*x+1/
120*b^5*ln(f)^5*f^a*Ei(1,-b/x*ln(f))
```

maxima [B] time = 1.52, size = 22, normalized size = 1.00

$$-b^5f^a\Gamma\left(-5,-\frac{b\log(f)}{x}\right)\log(f)^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)*x^4,x, algorithm="maxima")
```

```
[Out] -b^5*f^a*gamma(-5, -b*log(f)/x)*log(f)^5
```

mupad [B] time = 3.69, size = 99, normalized size = 4.50

$$\frac{b^5\,f^a\,\ln(f)^5\,\mathrm{expint}\left(-\frac{b\,\ln(f)}{x}\right)}{120}+b^5\,f^a\,f^{b/x}\,\ln(f)^5\,\left(\frac{x^2}{120\,b^2\,\ln(f)^2}+\frac{x^3}{60\,b^3\,\ln(f)^3}+\frac{x^4}{20\,b^4\,\ln(f)^4}+\frac{x^5}{5\,b^5\,\ln(f)^5}+\frac{}{120}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x)*x^4,x)
```

```
[Out] (b^5*f^a*log(f)^5*expint(-(b*log(f))/x))/120 + b^5*f^a*f^(b/x)*log(f)^5*(x^
2/(120*b^2*log(f)^2) + x^3/(60*b^3*log(f)^3) + x^4/(20*b^4*log(f)^4) + x^5/
(5*b^5*log(f)^5) + x/(120*b*log(f)))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x}}x^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x)*x**4,x)
```

```
[Out] Integral(f**(a + b/x)*x**4, x)
```

3.117 $\int f^{a+\frac{b}{x}} x^3 \, dx$

Optimal. Leaf size=21

$$b^4 f^a \log^4(f) \Gamma\left(-4, -\frac{b \log(f)}{x}\right)$$

```
[Out] f^a*x^4*Ei(5,-b*ln(f)/x)
```

Rubi [A] time = 0.02, antiderivative size = 21, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2218}

$$b^4 f^a \log^4(f) \text{Gamma}\left(-4, -\frac{b \log(f)}{x}\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x)*x^3,x]
```

```
[Out] b^4*f^a*Gamma[-4, -((b*Log[f])/x)]*Log[f]^4
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+\frac{b}{x}} x^3 \, dx = b^4 f^a \Gamma\left(-4, -\frac{b \log(f)}{x}\right) \log^4(f)$$

Mathematica [A] time = 0.00, size = 21, normalized size = 1.00

$$b^4 f^a \log^4(f) \Gamma\left(-4, -\frac{b \log(f)}{x}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x)*x^3,x]
```

```
[Out] b^4*f^a*Gamma[-4, -((b*Log[f])/x)]*Log[f]^4
```

fricas [B] time = 0.41, size = 68, normalized size = 3.24

$$-\frac{1}{24}\,b^{4}f^{a}\mathrm{Ei}\left(\frac{b\log(f)}{x}\right)\log(f)^{4}+\frac{1}{24}\left(b^{3}x\log(f)^{3}+b^{2}x^{2}\log(f)^{2}+2\,bx^{3}\log(f)+6\,x^{4}\right)f^{\frac{ax+b}{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)*x^3,x, algorithm="fricas")
```

```
[Out] -1/24*b^4*f^a*Ei(b*log(f)/x)*log(f)^4 + 1/24*(b^3*x*log(f)^3 + b^2*x^2*log(
f)^2 + 2*b*x^3*log(f) + 6*x^4)*f^((a*x + b)/x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x}}x^{3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)*x^3,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x)*x^3, x)
```

maple [B] time = 0.09, size = 99, normalized size = 4.71

$$\frac{b^{4}f^{a}\,\mathrm{Ei}\left(1,-\frac{b\ln(f)}{x}\right)\ln(f)^{4}}{24}+\frac{b^{3}x\,f^{a}f^{\frac{b}{x}}\ln(f)^{3}}{24}+\frac{b^{2}x^{2}f^{a}f^{\frac{b}{x}}\ln(f)^{2}}{24}+\frac{b\,x^{3}f^{a}f^{\frac{b}{x}}\ln(f)}{12}+\frac{x^{4}f^{a}f^{\frac{b}{x}}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x)*x^3,x)
```

```
[Out] 1/4*f^a*f^(b/x)*x^4+1/12*b*ln(f)*f^a*f^(b/x)*x^3+1/24*b^2*ln(f)^2*f^a*f^(b/
x)*x^2+1/24*b^3*ln(f)^3*f^a*f^(b/x)*x+1/24*b^4*ln(f)^4*f^a*Ei(1,-b/x*ln(f))
```

maxima [B] time = 1.63, size = 21, normalized size = 1.00

$$b^{4}f^{a}\Gamma\left(-4,-\frac{b\log(f)}{x}\right)\log(f)^{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)*x^3,x, algorithm="maxima")
```

```
[Out] b^4*f^a*gamma(-4, -b*log(f)/x)*log(f)^4
```

mupad [B] time = 3.63, size = 87, normalized size = 4.14

$$\frac{b^4 f^a \ln(f)^4 \operatorname{expint}\left(-\frac{b \ln(f)}{x}\right)}{24} + b^4 f^a f^{b/x} \ln(f)^4 \left(\frac{x^2}{24 b^2 \ln(f)^2} + \frac{x^3}{12 b^3 \ln(f)^3} + \frac{x^4}{4 b^4 \ln(f)^4} + \frac{x}{24 b \ln(f)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x)*x^3,x)
```

```
[Out] (b^4*f^a*log(f)^4*expint(-(b*log(f))/x))/24 + b^4*f^a*f^(b/x)*log(f)^4*(x^2
/(24*b^2*log(f)^2) + x^3/(12*b^3*log(f)^3) + x^4/(4*b^4*log(f)^4) + x/(24*b
*log(f)))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x}} x^3 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x)*x**3,x)
```

```
[Out] Integral(f**(a + b/x)*x**3, x)
```

3.118 $\int f^{a+\frac{b}{x}} x^2 \, dx$

Optimal. Leaf size=79

$$-\frac{1}{6}b^3 f^a \log^3(f)\text{Ei}\left(\frac{b\log(f)}{x}\right)+\frac{1}{6}b^2 x\log^2(f)f^{a+\frac{b}{x}}+\frac{1}{3}x^3 f^{a+\frac{b}{x}}+\frac{1}{6}bx^2\log(f)f^{a+\frac{b}{x}}$$

```
[Out] 1/3*f^(a+b/x)*x^3+1/6*b*f^(a+b/x)*x^2*ln(f)+1/6*b^2*f^(a+b/x)*x*ln(f)^2-1/6
*b^3*f^a*Ei(b*ln(f)/x)*ln(f)^3
```

Rubi [A] time = 0.06, antiderivative size = 79, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231, Rules used = {2214, 2206, 2210}

$$-\frac{1}{6}b^3 f^a \log^3(f)\text{Ei}\left(\frac{b\log(f)}{x}\right)+\frac{1}{6}b^2 x\log^2(f)f^{a+\frac{b}{x}}+\frac{1}{3}x^3 f^{a+\frac{b}{x}}+\frac{1}{6}bx^2\log(f)f^{a+\frac{b}{x}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x)*x^2,x]
```

```
[Out] (f^(a + b/x)*x^3)/3 + (b*f^(a + b/x)*x^2*Log[f])/6 + (b^2*f^(a + b/x)*x*Log
[f]^2)/6 - (b^3*f^a*ExpIntegralEi[(b*Log[f])/x]*Log[f]^3)/6
```

Rule 2206

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[((c +
 d*x)*F^(a + b*(c + d*x)^n))/d, x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\begin{aligned}
\int f^{a+\frac{b}{x}}x^2\,dx &= \frac{1}{3}f^{a+\frac{b}{x}}x^3+\frac{1}{3}(b\log(f))\int f^{a+\frac{b}{x}}x\,dx\\
&= \frac{1}{3}f^{a+\frac{b}{x}}x^3+\frac{1}{6}bf^{a+\frac{b}{x}}x^2\log(f)+\frac{1}{6}\left(b^2\log^2(f)\right)\int f^{a+\frac{b}{x}}\,dx\\
&= \frac{1}{3}f^{a+\frac{b}{x}}x^3+\frac{1}{6}bf^{a+\frac{b}{x}}x^2\log(f)+\frac{1}{6}b^2f^{a+\frac{b}{x}}x\log^2(f)+\frac{1}{6}\left(b^3\log^3(f)\right)\int \frac{f^{a+\frac{b}{x}}}{x}\,dx\\
&= \frac{1}{3}f^{a+\frac{b}{x}}x^3+\frac{1}{6}bf^{a+\frac{b}{x}}x^2\log(f)+\frac{1}{6}b^2f^{a+\frac{b}{x}}x\log^2(f)-\frac{1}{6}b^3f^a\text{Ei}\left(\frac{b\log(f)}{x}\right)\log^3(f)
\end{aligned}$$

Mathematica [A] time = 0.02, size = 53, normalized size = 0.67

$$\frac{1}{6}f^a\left(xf^{b/x}\left(b^2\log^2(f)+bx\log(f)+2x^2\right)-b^3\log^3(f)\text{Ei}\left(\frac{b\log(f)}{x}\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x)*x^2,x]
```

```
[Out] (f^a*(-(b^3*ExpIntegralEi[(b*Log[f])/x]*Log[f]^3) + f^(b/x)*x*(2*x^2 + b*x*
Log[f] + b^2*Log[f]^2)))/6
```

fricas [A] time = 0.41, size = 56, normalized size = 0.71

$$-\frac{1}{6}\,b^3f^a\text{Ei}\left(\frac{b\log(f)}{x}\right)\log(f)^3+\frac{1}{6}\left(b^2x\log(f)^2+bx^2\log(f)+2\,x^3\right)f^{\frac{ax+b}{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)*x^2,x, algorithm="fricas")
```

```
[Out] -1/6*b^3*f^a*Ei(b*log(f)/x)*log(f)^3 + 1/6*(b^2*x*log(f)^2 + b*x^2*log(f) +
 2*x^3)*f^((a*x + b)/x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x}}x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)*x^2,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x)*x^2, x)
```

maple [A] time = 0.09, size = 77, normalized size = 0.97

$$\frac{b^3 f^a \operatorname{Ei}\left(1, -\frac{b\ln(f)}{x}\right)\ln(f)^3}{6}+\frac{b^2 x f^a f^{\frac{b}{x}}\ln(f)^2}{6}+\frac{b x^2 f^a f^{\frac{b}{x}}\ln(f)}{6}+\frac{x^3 f^a f^{\frac{b}{x}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x)*x^2,x)
```

```
[Out] 1/3*f^a*f^(b/x)*x^3+1/6*b*ln(f)*f^a*f^(b/x)*x^2+1/6*b^2*ln(f)^2*f^a*f^(b/x)
*x+1/6*b^3*ln(f)^3*f^a*Ei(1,-b/x*ln(f))
```

maxima [A] time = 1.97, size = 22, normalized size = 0.28

$$-b^3 f^a \Gamma\left(-3, -\frac{b\log(f)}{x}\right)\log(f)^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)*x^2,x, algorithm="maxima")
```

```
[Out] -b^3*f^a*gamma(-3, -b*log(f)/x)*log(f)^3
```

mupad [B] time = 3.60, size = 66, normalized size = 0.84

$$b^3\,f^a\,\ln(f)^3\,\left(f^{b/x}\,\left(\frac{x^2}{6\,b^2\,\ln(f)^2}+\frac{x^3}{3\,b^3\,\ln(f)^3}+\frac{x}{6\,b\,\ln(f)}\right)+\frac{\mathrm{expint}\left(-\frac{b\,\ln(f)}{x}\right)}{6}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x)*x^2,x)
```

```
[Out] b^3*f^a*log(f)^3*(f^(b/x)*(x^2/(6*b^2*log(f)^2) + x^3/(3*b^3*log(f)^3) + x/
(6*b*log(f))) + expint(-(b*log(f))/x)/6)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x}}x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x)*x**2,x)
```

```
[Out] Integral(f**(a + b/x)*x**2, x)
```

3.119 $\int f^{a+\frac{b}{x}} x \, dx$

Optimal. Leaf size=56

$$-\frac{1}{2}b^2 f^a \log^2(f)\text{Ei}\left(\frac{b\log(f)}{x}\right)+\frac{1}{2}x^2 f^{a+\frac{b}{x}}+\frac{1}{2}bx\log(f)f^{a+\frac{b}{x}}$$

```
[Out] 1/2*f^(a+b/x)*x^2+1/2*b*f^(a+b/x)*x*ln(f)-1/2*b^2*f^a*Ei(b*ln(f)/x)*ln(f)^2
```

Rubi [A] time = 0.03, antiderivative size = 56, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {2214, 2206, 2210}

$$-\frac{1}{2}b^2 f^a \log^2(f)\text{Ei}\left(\frac{b\log(f)}{x}\right)+\frac{1}{2}x^2 f^{a+\frac{b}{x}}+\frac{1}{2}bx\log(f)f^{a+\frac{b}{x}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x)*x,x]
```

```
[Out] (f^(a + b/x)*x^2)/2 + (b*f^(a + b/x)*x*Log[f])/2 - (b^2*f^a*ExpIntegralEi[(
b*Log[f])/x]*Log[f]^2)/2
```

Rule 2206

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[((c +
 d*x)*F^(a + b*(c + d*x)^n))/d, x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\begin{aligned}\int f^{a+\frac{b}{x}} x\,dx &= \frac{1}{2} f^{a+\frac{b}{x}} x^2 + \frac{1}{2}(b\log(f)) \int f^{a+\frac{b}{x}}\,dx\\ &= \frac{1}{2} f^{a+\frac{b}{x}} x^2 + \frac{1}{2} b f^{a+\frac{b}{x}} x\log(f) + \frac{1}{2}\left(b^2\log^2(f)\right)\int \frac{f^{a+\frac{b}{x}}}{x}\,dx\\ &= \frac{1}{2} f^{a+\frac{b}{x}} x^2 + \frac{1}{2} b f^{a+\frac{b}{x}} x\log(f) - \frac{1}{2} b^2 f^a \text{Ei}\left(\frac{b\log(f)}{x}\right)\log^2(f)\end{aligned}$$

Mathematica [A] time = 0.02, size = 40, normalized size = 0.71

$$\frac{1}{2} f^a \left(x f^{b/x}(b\log(f)+x) - b^2\log^2(f)\text{Ei}\left(\frac{b\log(f)}{x}\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x)*x,x]
```

```
[Out] (f^a*(-(b^2*ExpIntegralEi[(b*Log[f])/x]*Log[f]^2) + f^(b/x)*x*(x + b*Log[f]
)))/2
```

fricas [A] time = 0.42, size = 43, normalized size = 0.77

$$-\frac{1}{2} b^2 f^a \text{Ei}\left(\frac{b\log(f)}{x}\right)\log(f)^2 + \frac{1}{2}\left(bx\log(f) + x^2\right) f^{\frac{ax+b}{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)*x,x, algorithm="fricas")
```

```
[Out] -1/2*b^2*f^a*Ei(b*log(f)/x)*log(f)^2 + 1/2*(b*x*log(f) + x^2)*f^((a*x + b)/
x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x}} x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)*x,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x)*x, x)
```

maple [A] time = 0.09, size = 55, normalized size = 0.98

$$\frac{b^2 f^a \operatorname{Ei}\left(1, -\frac{b\ln(f)}{x}\right)\ln(f)^2}{2} + \frac{bx\, f^a f^{\frac{b}{x}} \ln(f)}{2} + \frac{x^2 f^a f^{\frac{b}{x}}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x)*x,x)
```

```
[Out] 1/2*f^a*f^(b/x)*x^2+1/2*b*ln(f)*f^a*f^(b/x)*x+1/2*b^2*ln(f)^2*f^a*Ei(1,-b/x
*ln(f))
```

maxima [A] time = 1.62, size = 21, normalized size = 0.38

$$b^2 f^a \Gamma\left(-2, -\frac{b\log(f)}{x}\right)\log(f)^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)*x,x, algorithm="maxima")
```

```
[Out] b^2*f^a*gamma(-2, -b*log(f)/x)*log(f)^2
```

mupad [B] time = 3.64, size = 54, normalized size = 0.96

$$b^2\, f^a\, \ln(f)^2 \left(f^{b/x}\left(\frac{x^2}{2\, b^2\, \ln(f)^2} + \frac{x}{2\, b\, \ln(f)}\right) + \frac{\operatorname{expint}\left(-\frac{b\, \ln(f)}{x}\right)}{2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x)*x,x)
```

```
[Out] b^2*f^a*log(f)^2*(f^(b/x)*(x^2/(2*b^2*log(f)^2) + x/(2*b*log(f))) + expint(
-(b*log(f))/x)/2)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x}} x\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x)*x,x)
```

```
[Out] Integral(f**(a + b/x)*x, x)
```

3.120 $\int f^{a+\frac{b}{x}}\,dx$

Optimal. Leaf size=28

$$xf^{a+\frac{b}{x}}-bf^a\log(f)\text{Ei}\left(\frac{b\log(f)}{x}\right)$$

```
[Out] f^(a+b/x)*x-b*f^a*Ei(b*ln(f)/x)*ln(f)
```

Rubi [A] time = 0.02, antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {2206, 2210}

$$xf^{a+\frac{b}{x}}-bf^a\log(f)\text{Ei}\left(\frac{b\log(f)}{x}\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x),x]
```

```
[Out] f^(a + b/x)*x - b*f^a*ExpIntegralEi[(b*Log[f])/x]*Log[f]
```

Rule 2206

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[((c +
 d*x)*F^(a + b*(c + d*x)^n))/d, x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\begin{aligned}\int f^{a+\frac{b}{x}}\,dx &= f^{a+\frac{b}{x}}x+(b\log(f))\int\frac{f^{a+\frac{b}{x}}}{x}\,dx\\ &= f^{a+\frac{b}{x}}x-bf^a\text{Ei}\left(\frac{b\log(f)}{x}\right)\log(f)\end{aligned}$$

Mathematica [A] time = 0.01, size = 28, normalized size = 1.00

$$xf^{a+\frac{b}{x}} - bf^a \log(f)\text{Ei}\left(\frac{b\log(f)}{x}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x),x]
[Out] f^(a + b/x)*x - b*f^a*ExpIntegralEi[(b*Log[f])/x]*Log[f]
```

fricas [A] time = 0.42, size = 30, normalized size = 1.07

$$-bf^a\text{Ei}\left(\frac{b\log(f)}{x}\right)\log(f) + f^{\frac{ax+b}{x}}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x),x, algorithm="fricas")
[Out] -b*f^a*Ei(b*log(f)/x)*log(f) + f^((a*x + b)/x)*x
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x),x, algorithm="giac")
[Out] integrate(f^(a + b/x), x)
```

maple [A] time = 0.08, size = 31, normalized size = 1.11

$$b\,f^a\,\text{Ei}\left(1, -\frac{b\ln(f)}{x}\right)\ln(f) + x\,f^a f^{\frac{b}{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x),x)
[Out] b*ln(f)*f^a*Ei(1,-b/x*ln(f))+f^a*f^(b/x)*x
```

maxima [A] time = 1.58, size = 18, normalized size = 0.64

$$-bf^a\Gamma\left(-1, -\frac{b\log(f)}{x}\right)\log(f)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x),x, algorithm="maxima")
```

```
[Out] -b*f^a*gamma(-1, -b*log(f)/x)*log(f)
```

mupad [B] time = 3.60, size = 27, normalized size = 0.96

$$f^a \left(f^{b/x} x + b \ln(f) \operatorname{expint}\left(-\frac{b \ln(f)}{x}\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x),x)
```

```
[Out] f^a*(f^(b/x)*x + b*log(f)*expint(-(b*log(f))/x))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x),x)
```

```
[Out] Integral(f**(a + b/x), x)
```

3.121 $\int \frac{f^{a+\frac{b}{x}}}{x} \, dx$

Optimal. Leaf size=13

$$-f^a \text{Ei}\left(\frac{b \log(f)}{x}\right)$$

```
[Out] -f^a*Ei(b*ln(f)/x)
```

Rubi [A] time = 0.02, antiderivative size = 13, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2210}

$$-f^a \text{Ei}\left(\frac{b \log(f)}{x}\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x)/x,x]
```

```
[Out] -(f^a*ExpIntegralEi[(b*Log[f])/x])
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x}}}{x} \, dx = -f^a \text{Ei}\left(\frac{b \log(f)}{x}\right)$$

Mathematica [A] time = 0.00, size = 13, normalized size = 1.00

$$-f^a \text{Ei}\left(\frac{b \log(f)}{x}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x)/x,x]
```

```
[Out] -(f^a*ExpIntegralEi[(b*Log[f])/x])
```

fricas [A] time = 0.41, size = 13, normalized size = 1.00

$$-f^a\text{Ei}\left(\frac{b\log(f)}{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)/x,x, algorithm="fricas")
```

```
[Out] -f^a*Ei(b*log(f)/x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+\frac{b}{x}}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)/x,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x)/x, x)
```

maple [A] time = 0.08, size = 15, normalized size = 1.15

$$f^a\,\text{Ei}\left(1,-\frac{b\ln(f)}{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x)/x,x)
```

```
[Out] f^a*Ei(1,-b/x*ln(f))
```

maxima [A] time = 1.59, size = 13, normalized size = 1.00

$$-f^a\text{Ei}\left(\frac{b\log(f)}{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)/x,x, algorithm="maxima")
```

```
[Out] -f^a*Ei(b*log(f)/x)
```

mupad [B] time = 3.49, size = 13, normalized size = 1.00

$$-f^a\,\mathrm{ei}\left(\frac{b\ \ln(f)}{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x)/x,x)
```

```
[Out] -f^a*ei((b*log(f))/x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+\frac{b}{x}}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x)/x,x)
```

```
[Out] Integral(f**(a + b/x)/x, x)
```

3.122 $\int \frac{f^{a+\frac{b}{x}}}{x^2} dx$

Optimal. Leaf size=18

$$-\frac{f^{a+\frac{b}{x}}}{b\log(f)}$$

[Out] -f^(a+b/x)/b/ln(f)

Rubi [A] time = 0.02, antiderivative size = 18, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2209}

$$-\frac{f^{a+\frac{b}{x}}}{b\log(f)}$$

Antiderivative was successfully verified.

[In] Int[f^(a + b/x)/x^2,x]

[Out] -(f^(a + b/x)/(b*Log[f]))

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x}}}{x^2} dx = -\frac{f^{a+\frac{b}{x}}}{b\log(f)}$$

Mathematica [A] time = 0.00, size = 18, normalized size = 1.00

$$-\frac{f^{a+\frac{b}{x}}}{b\log(f)}$$

Antiderivative was successfully verified.

[In] Integrate[f^(a + b/x)/x^2,x]

```
[Out] -(f^(a + b/x)/(b*Log[f]))
```

fricas [A] time = 0.41, size = 20, normalized size = 1.11

$$-\frac{f^{\frac{ax+b}{x}}}{b\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)/x^2,x, algorithm="fricas")
[Out] -f^((a*x + b)/x)/(b*log(f))
```

giac [A] time = 0.18, size = 20, normalized size = 1.11

$$-\frac{f^{\frac{ax+b}{x}}}{b\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)/x^2,x, algorithm="giac")
[Out] -f^((a*x + b)/x)/(b*log(f))
```

maple [A] time = 0.00, size = 19, normalized size = 1.06

$$-\frac{f^{a+\frac{b}{x}}}{b\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x)/x^2,x)
[Out] -f^(a+b/x)/b/ln(f)
```

maxima [A] time = 1.06, size = 18, normalized size = 1.00

$$-\frac{f^{a+\frac{b}{x}}}{b\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)/x^2,x, algorithm="maxima")
[Out] -f^(a + b/x)/(b*log(f))
```

mupad [B] time = 3.52, size = 18, normalized size = 1.00

$$-\frac{f^{a+\frac{b}{x}}}{b\,\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x)/x^2,x)
```

```
[Out] -f^(a + b/x)/(b*log(f))
```

sympy [A] time = 0.12, size = 20, normalized size = 1.11

$$\begin{cases} -\frac{f^{a+\frac{b}{x}}}{b\log(f)} & \text{for } b\log(f) \neq 0 \\ -\frac{1}{x} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x)/x**2,x)
```

```
[Out] Piecewise((-f**(a + b/x)/(b*log(f)), Ne(b*log(f), 0)), (-1/x, True))
```

3.123 $\int \frac{f^{a+\frac{b}{x}}}{x^3}\,dx$

Optimal. Leaf size=39

$$\frac{f^{a+\frac{b}{x}}}{b^2\log^2(f)}-\frac{f^{a+\frac{b}{x}}}{bx\log(f)}$$

```
[Out] f^(a+b/x)/b^2/ln(f)^2-f^(a+b/x)/b/x/ln(f)
```

Rubi [A] time = 0.04, antiderivative size = 39, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2212, 2209}

$$\frac{f^{a+\frac{b}{x}}}{b^2\log^2(f)}-\frac{f^{a+\frac{b}{x}}}{bx\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x)/x^3,x]
```

```
[Out] f^(a + b/x)/(b^2*Log[f]^2) - f^(a + b/x)/(b*x*Log[f])
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x}}}{x^3}\,dx = -\frac{f^{a+\frac{b}{x}}}{bx\log(f)} - \frac{\int \frac{f^{a+\frac{b}{x}}}{x^2}\,dx}{b\log(f)}$$
$$= \frac{f^{a+\frac{b}{x}}}{b^2\log^2(f)} - \frac{f^{a+\frac{b}{x}}}{bx\log(f)}$$

Mathematica [A] time = 0.01, size = 27, normalized size = 0.69

$$\frac{f^{a+\frac{b}{x}}(x-b\log(f))}{b^2x\log^2(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x)/x^3,x]
```

```
[Out] (f^(a + b/x)*(x - b*Log[f]))/(b^2*x*Log[f]^2)
```

fricas [A] time = 0.40, size = 31, normalized size = 0.79

$$-\frac{\left(b\log(f)-x\right)f^{\frac{ax+b}{x}}}{b^2x\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)/x^3,x, algorithm="fricas")
```

```
[Out] -(b*log(f) - x)*f^((a*x + b)/x)/(b^2*x*log(f)^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+\frac{b}{x}}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)/x^3,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x)/x^3, x)
```

maple [A] time = 0.02, size = 49, normalized size = 1.26

$$\frac{-\frac{x\,\mathrm{e}^{\left(a+\frac{b}{x}\right)\ln(f)}}{b\ln(f)}+\frac{x^2\mathrm{e}^{\left(a+\frac{b}{x}\right)\ln(f)}}{b^2\ln(f)^2}}{x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x)/x^3,x)
[Out] (1/b^2/ln(f)^2*x^2*exp((a+b/x)*ln(f))-1/b/ln(f)*x*exp((a+b/x)*ln(f)))/x^2
```

maxima [C] time = 1.29, size = 21, normalized size = 0.54

$$\frac{f^a\Gamma\left(2,-\frac{b\log(f)}{x}\right)}{b^2\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)/x^3,x, algorithm="maxima")
[Out] f^a*gamma(2, -b*log(f)/x)/(b^2*log(f)^2)
```

mupad [B] time = 3.55, size = 27, normalized size = 0.69

$$\frac{f^{a+\frac{b}{x}}\left(x-b\ \ln(f)\right)}{b^2\,x\ln(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x)/x^3,x)
[Out] (f^(a + b/x)*(x - b*log(f)))/(b^2*x*log(f)^2)
```

sympy [A] time = 0.12, size = 22, normalized size = 0.56

$$\frac{f^{a+\frac{b}{x}}\left(-b\log\left(f\right)+x\right)}{b^2x\log\left(f\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x)/x**3,x)
[Out] f**(a + b/x)*(-b*log(f) + x)/(b**2*x*log(f)**2)
```

3.124 $\int \frac{f^{a+\frac{b}{x}}}{x^4} dx$

Optimal. Leaf size=61

$$-\frac{2f^{a+\frac{b}{x}}}{b^3\log^3(f)}+\frac{2f^{a+\frac{b}{x}}}{b^2x\log^2(f)}-\frac{f^{a+\frac{b}{x}}}{bx^2\log(f)}$$

```
[Out] -2*f^(a+b/x)/b^3/ln(f)^3+2*f^(a+b/x)/b^2/x/ln(f)^2-f^(a+b/x)/b/x^2/ln(f)
```

Rubi [A] time = 0.06, antiderivative size = 61, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2212, 2209}

$$\frac{2f^{a+\frac{b}{x}}}{b^2x\log^2(f)}-\frac{2f^{a+\frac{b}{x}}}{b^3\log^3(f)}-\frac{f^{a+\frac{b}{x}}}{bx^2\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x)/x^4,x]
```

```
[Out] (-2*f^(a + b/x))/(b^3*Log[f]^3) + (2*f^(a + b/x))/(b^2*x*Log[f]^2) - f^(a +
 b/x)/(b*x^2*Log[f])
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x}}}{x^4}\,dx = -\frac{f^{a+\frac{b}{x}}}{bx^2\log(f)} - \frac{2\int \frac{f^{a+\frac{b}{x}}}{x^3}\,dx}{b\log(f)}$$
$$= \frac{2f^{a+\frac{b}{x}}}{b^2x\log^2(f)} - \frac{f^{a+\frac{b}{x}}}{bx^2\log(f)} + \frac{2\int \frac{f^{a+\frac{b}{x}}}{x^2}\,dx}{b^2\log^2(f)}$$
$$= -\frac{2f^{a+\frac{b}{x}}}{b^3\log^3(f)} + \frac{2f^{a+\frac{b}{x}}}{b^2x\log^2(f)} - \frac{f^{a+\frac{b}{x}}}{bx^2\log(f)}$$

Mathematica [A] time = 0.01, size = 41, normalized size = 0.67

$$-\frac{f^{a+\frac{b}{x}}\left(b^2\log^2(f)-2bx\log(f)+2x^2\right)}{b^3x^2\log^3(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x)/x^4,x]
[Out] -((f^(a + b/x)*(2*x^2 - 2*b*x*Log[f] + b^2*Log[f]^2))/(b^3*x^2*Log[f]^3))
```

fricas [A] time = 0.41, size = 43, normalized size = 0.70

$$-\frac{\left(b^2\log(f)^2-2\,bx\log(f)+2\,x^2\right)f^{\frac{ax+b}{x}}}{b^3x^2\log(f)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)/x^4,x, algorithm="fricas")
[Out] -(b^2*log(f)^2 - 2*b*x*log(f) + 2*x^2)*f^((a*x + b)/x)/(b^3*x^2*log(f)^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+\frac{b}{x}}}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)/x^4,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x)/x^4, x)
```

maple [A] time = 0.02, size = 73, normalized size = 1.20

$$\frac{-\frac{x\,e^{\left(a+\frac{b}{x}\right)\ln(f)}}{b\ln(f)}+\frac{2x^2e^{\left(a+\frac{b}{x}\right)\ln(f)}}{b^2\ln(f)^2}-\frac{2x^3e^{\left(a+\frac{b}{x}\right)\ln(f)}}{b^3\ln(f)^3}}{x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x)/x^4,x)
```

```
[Out] (-2/b^3/ln(f)^3*x^3*exp((a+b/x)*ln(f))+2/b^2*x^2*exp((a+b/x)*ln(f))/ln(f)^2
-1/b*x*exp((a+b/x)*ln(f))/ln(f))/x^3
```

maxima [C] time = 1.26, size = 22, normalized size = 0.36

$$-\frac{f^a\Gamma\left(3,-\frac{b\log(f)}{x}\right)}{b^3\log(f)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)/x^4,x, algorithm="maxima")
```

```
[Out] -f^a*gamma(3, -b*log(f)/x)/(b^3*log(f)^3)
```

mupad [B] time = 3.55, size = 45, normalized size = 0.74

$$-\frac{f^{a+\frac{b}{x}}\left(\frac{1}{b\,\ln(f)}+\frac{2\,x^2}{b^3\ln(f)^3}-\frac{2\,x}{b^2\ln(f)^2}\right)}{x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x)/x^4,x)
```

```
[Out] -(f^(a + b/x)*(1/(b*log(f)) + (2*x^2)/(b^3*log(f)^3) - (2*x)/(b^2*log(f)^2)
))/x^2
```

sympy [A] time = 0.14, size = 39, normalized size = 0.64

$$\frac{f^{a+\frac{b}{x}}\left(-b^2\log{(f)}^2+2bx\log{(f)}-2x^2\right)}{b^3x^2\log{(f)}^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x)/x**4,x)

[Out] f**(a + b/x)*(-b**2*log(f)**2 + 2*b*x*log(f) - 2*x**2)/(b**3*x**2*log(f)**3
)
```

3.125 $\int \frac{f^{a+\frac{b}{x}}}{x^5} dx$

Optimal. Leaf size=82

$$\frac{6f^{a+\frac{b}{x}}}{b^4\log^4(f)} - \frac{6f^{a+\frac{b}{x}}}{b^3x\log^3(f)} + \frac{3f^{a+\frac{b}{x}}}{b^2x^2\log^2(f)} - \frac{f^{a+\frac{b}{x}}}{bx^3\log(f)}$$

```
[Out] 6*f^(a+b/x)/b^4/ln(f)^4-6*f^(a+b/x)/b^3/x/ln(f)^3+3*f^(a+b/x)/b^2/x^2/ln(f)
^2-f^(a+b/x)/b/x^3/ln(f)
```

Rubi [A] time = 0.08, antiderivative size = 82, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2212, 2209}

$$\frac{3f^{a+\frac{b}{x}}}{b^2x^2\log^2(f)} - \frac{6f^{a+\frac{b}{x}}}{b^3x\log^3(f)} + \frac{6f^{a+\frac{b}{x}}}{b^4\log^4(f)} - \frac{f^{a+\frac{b}{x}}}{bx^3\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x)/x^5,x]
```

```
[Out] (6*f^(a + b/x))/(b^4*Log[f]^4) - (6*f^(a + b/x))/(b^3*x*Log[f]^3) + (3*f^(a
 + b/x))/(b^2*x^2*Log[f]^2) - f^(a + b/x)/(b*x^3*Log[f])
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x}}}{x^5}\,dx = -\frac{f^{a+\frac{b}{x}}}{bx^3\log(f)} - \frac{3\int \frac{f^{a+\frac{b}{x}}}{x^4}\,dx}{b\log(f)}$$
$$= \frac{3f^{a+\frac{b}{x}}}{b^2x^2\log^2(f)} - \frac{f^{a+\frac{b}{x}}}{bx^3\log(f)} + \frac{6\int \frac{f^{a+\frac{b}{x}}}{x^3}\,dx}{b^2\log^2(f)}$$
$$= -\frac{6f^{a+\frac{b}{x}}}{b^3x\log^3(f)} + \frac{3f^{a+\frac{b}{x}}}{b^2x^2\log^2(f)} - \frac{f^{a+\frac{b}{x}}}{bx^3\log(f)} - \frac{6\int \frac{f^{a+\frac{b}{x}}}{x^2}\,dx}{b^3\log^3(f)}$$
$$= \frac{6f^{a+\frac{b}{x}}}{b^4\log^4(f)} - \frac{6f^{a+\frac{b}{x}}}{b^3x\log^3(f)} + \frac{3f^{a+\frac{b}{x}}}{b^2x^2\log^2(f)} - \frac{f^{a+\frac{b}{x}}}{bx^3\log(f)}$$

Mathematica [A] time = 0.01, size = 53, normalized size = 0.65

$$\frac{f^{a+\frac{b}{x}}\left(-b^3\log^3(f)+3b^2x\log^2(f)-6bx^2\log(f)+6x^3\right)}{b^4x^3\log^4(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x)/x^5,x]
```

```
[Out] (f^(a + b/x)*(6*x^3 - 6*b*x^2*Log[f] + 3*b^2*x*Log[f]^2 - b^3*Log[f]^3))/(b
^4*x^3*Log[f]^4)
```

fricas [A] time = 0.42, size = 55, normalized size = 0.67

$$-\frac{\left(b^3\log(f)^3-3\,b^2x\log(f)^2+6\,bx^2\log(f)-6\,x^3\right)f^{\frac{ax+b}{x}}}{b^4x^3\log(f)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)/x^5,x, algorithm="fricas")
```

```
[Out] -(b^3*log(f)^3 - 3*b^2*x*log(f)^2 + 6*b*x^2*log(f) - 6*x^3)*f^((a*x + b)/x)
/(b^4*x^3*log(f)^4)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+\frac{b}{x}}}{x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)/x^5,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x)/x^5, x)
```

maple [A] time = 0.03, size = 96, normalized size = 1.17

$$\frac{-\frac{x\,e^{\left(a+\frac{b}{x}\right)\ln(f)}}{b\ln(f)}+\frac{3x^2 e^{\left(a+\frac{b}{x}\right)\ln(f)}}{b^2\ln(f)^2}-\frac{6x^3 e^{\left(a+\frac{b}{x}\right)\ln(f)}}{b^3\ln(f)^3}+\frac{6x^4 e^{\left(a+\frac{b}{x}\right)\ln(f)}}{b^4\ln(f)^4}}{x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x)/x^5,x)
```

```
[Out] (6/b^4/ln(f)^4*x^4*exp((a+b/x)*ln(f))-6/b^3*x^3*exp((a+b/x)*ln(f))/ln(f)^3+
3/b^2*x^2*exp((a+b/x)*ln(f))/ln(f)^2-1/b*x*exp((a+b/x)*ln(f))/ln(f))/x^4
```

maxima [C] time = 1.30, size = 21, normalized size = 0.26

$$\frac{f^a\Gamma\left(4,-\frac{b\log(f)}{x}\right)}{b^4\log(f)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)/x^5,x, algorithm="maxima")
```

```
[Out] f^a*gamma(4, -b*log(f)/x)/(b^4*log(f)^4)
```

mupad [B] time = 3.55, size = 57, normalized size = 0.70

$$-\frac{f^{a+\frac{b}{x}}\left(\frac{1}{b\,\ln(f)}+\frac{6\,x^2}{b^3\ln(f)^3}-\frac{6\,x^3}{b^4\ln(f)^4}-\frac{3\,x}{b^2\ln(f)^2}\right)}{x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x)/x^5,x)
```

```
[Out] -(f^(a + b/x)*(1/(b*log(f)) + (6*x^2)/(b^3*log(f)^3) - (6*x^3)/(b^4*log(f)^
4) - (3*x)/(b^2*log(f)^2)))/x^3
```

sympy [A] time = 0.15, size = 53, normalized size = 0.65

$$\frac{f^{a+\frac{b}{x}}\left(-b^3\log(f)^3+3b^2x\log(f)^2-6bx^2\log(f)+6x^3\right)}{b^4x^3\log(f)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x)/x**5,x)
```

```
[Out] f**(a + b/x)*(-b**3*log(f)**3 + 3*b**2*x*log(f)**2 - 6*b*x**2*log(f) + 6*x*
*3)/(b**4*x**3*log(f)**4)
```

3.126 $\int \frac{f^{a+\frac{b}{x}}}{x^6}\,dx$

Optimal. Leaf size=65

$$-\frac{f^{a+\frac{b}{x}}\left(b^4\log^4(f)-4b^3x\log^3(f)+12b^2x^2\log^2(f)-24bx^3\log(f)+24x^4\right)}{b^5x^4\log^5(f)}$$

```
[Out] -f^(a+b/x)*(24*x^4-24*b*x^3*ln(f)+12*b^2*x^2*ln(f)^2-4*b^3*x*ln(f)^3+b^4*ln
(f)^4)/b^5/x^4/ln(f)^5
```

Rubi [C] time = 0.02, antiderivative size = 22, normalized size of antiderivative = 0.34, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2218}

$$-\frac{f^a\text{Gamma}\left(5,-\frac{b\log(f)}{x}\right)}{b^5\log^5(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x)/x^6,x]
```

```
[Out] -((f^a*Gamma[5, -((b*Log[f])/x)])/(b^5*Log[f]^5))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x}}}{x^6}\,dx = -\frac{f^a\Gamma\left(5,-\frac{b\log(f)}{x}\right)}{b^5\log^5(f)}$$

Mathematica [C] time = 0.00, size = 22, normalized size = 0.34

$$-\frac{f^a\Gamma\left(5,-\frac{b\log(f)}{x}\right)}{b^5\log^5(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x)/x^6,x]
```

```
[Out] -((f^a*Gamma[5, -((b*Log[f])/x)])/(b^5*Log[f]^5))
```

fricas [A] time = 0.42, size = 67, normalized size = 1.03

$$-\frac{\left(b^{4}\log\left(f\right)^{4}-4\,b^{3}x\log\left(f\right)^{3}+12\,b^{2}x^{2}\log\left(f\right)^{2}-24\,bx^{3}\log\left(f\right)+24\,x^{4}\right)f^{\frac{ax+b}{x}}}{b^{5}x^{4}\log\left(f\right)^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)/x^6,x, algorithm="fricas")
```

```
[Out] -(b^4*log(f)^4 - 4*b^3*x*log(f)^3 + 12*b^2*x^2*log(f)^2 - 24*b*x^3*log(f) +
 24*x^4)*f^((a*x + b)/x)/(b^5*x^4*log(f)^5)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+\frac{b}{x}}}{x^{6}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)/x^6,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x)/x^6, x)
```

maple [A] time = 0.03, size = 119, normalized size = 1.83

$$\frac{-\frac{x\,{\mathrm e}^{\left(a+\frac{b}{x}\right)\ln\left(f\right)}}{b\ln\left(f\right)}+\frac{4x^{2}{\mathrm e}^{\left(a+\frac{b}{x}\right)\ln\left(f\right)}}{b^{2}\ln\left(f\right)^{2}}-\frac{12x^{3}{\mathrm e}^{\left(a+\frac{b}{x}\right)\ln\left(f\right)}}{b^{3}\ln\left(f\right)^{3}}+\frac{24x^{4}{\mathrm e}^{\left(a+\frac{b}{x}\right)\ln\left(f\right)}}{b^{4}\ln\left(f\right)^{4}}-\frac{24x^{5}{\mathrm e}^{\left(a+\frac{b}{x}\right)\ln\left(f\right)}}{b^{5}\ln\left(f\right)^{5}}}{x^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x)/x^6,x)
```

```
[Out] (-24/b^5/ln(f)^5*x^5*exp((a+b/x)*ln(f))+24/b^4*x^4*exp((a+b/x)*ln(f))/ln(f)
^4-12/b^3*x^3*exp((a+b/x)*ln(f))/ln(f)^3+4/b^2*x^2*exp((a+b/x)*ln(f))/ln(f)
^2-1/b*x*exp((a+b/x)*ln(f))/ln(f))/x^5
```

maxima [C] time = 1.24, size = 22, normalized size = 0.34

$$-\frac{f^{a}\Gamma\left(5,-\frac{b\log\left(f\right)}{x}\right)}{b^{5}\log\left(f\right)^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)/x^6,x, algorithm="maxima")
```

```
[Out] -f^a*gamma(5, -b*log(f)/x)/(b^5*log(f)^5)
```

mupad [B] time = 3.60, size = 69, normalized size = 1.06

$$-\frac{f^{a+\frac{b}{x}}\left(\frac{1}{b\,\ln(f)}+\frac{12\,x^2}{b^3\,\ln(f)^3}-\frac{24\,x^3}{b^4\,\ln(f)^4}+\frac{24\,x^4}{b^5\,\ln(f)^5}-\frac{4\,x}{b^2\,\ln(f)^2}\right)}{x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x)/x^6,x)
```

```
[Out] -(f^(a + b/x)*(1/(b*log(f)) + (12*x^2)/(b^3*log(f)^3) - (24*x^3)/(b^4*log(f
)^4) + (24*x^4)/(b^5*log(f)^5) - (4*x)/(b^2*log(f)^2)))/x^4
```

sympy [A] time = 0.16, size = 66, normalized size = 1.02

$$\frac{f^{a+\frac{b}{x}}\left(-b^4\log(f)^4+4b^3x\log(f)^3-12b^2x^2\log(f)^2+24bx^3\log(f)-24x^4\right)}{b^5x^4\log(f)^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x)/x**6,x)
```

```
[Out] f**(a + b/x)*(-b**4*log(f)**4 + 4*b**3*x*log(f)**3 - 12*b**2*x**2*log(f)**2
 + 24*b*x**3*log(f) - 24*x**4)/(b**5*x**4*log(f)**5)
```

3.127 $\int \frac{f^{a+\frac{b}{x}}}{x^7}\,dx$

Optimal. Leaf size=77

$$\frac{f^{a+\frac{b}{x}}\left(-b^5\log^5(f)+5b^4x\log^4(f)-20b^3x^2\log^3(f)+60b^2x^3\log^2(f)-120bx^4\log(f)+120x^5\right)}{b^6x^5\log^6(f)}$$

```
[Out] f^(a+b/x)*(120*x^5-120*b*x^4*ln(f)+60*b^2*x^3*ln(f)^2-20*b^3*x^2*ln(f)^3+5*
b^4*x*ln(f)^4-b^5*ln(f)^5)/b^6/x^5/ln(f)^6
```

Rubi [C] time = 0.02, antiderivative size = 21, normalized size of antiderivative = 0.27, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2218}

$$\frac{f^a\text{Gamma}\left(6,-\frac{b\log(f)}{x}\right)}{b^6\log^6(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x)/x^7,x]
```

```
[Out] (f^a*Gamma[6, -((b*Log[f])/x)])/(b^6*Log[f]^6)
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x}}}{x^7}\,dx=\frac{f^a\Gamma\left(6,-\frac{b\log(f)}{x}\right)}{b^6\log^6(f)}$$

Mathematica [C] time = 0.00, size = 21, normalized size = 0.27

$$\frac{f^a\Gamma\left(6,-\frac{b\log(f)}{x}\right)}{b^6\log^6(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x)/x^7,x]
```

```
[Out] (f^a*Gamma[6, -((b*Log[f])/x)])/(b^6*Log[f]^6)
```

fricas [A] time = 0.41, size = 79, normalized size = 1.03

$$-\frac{\left(b^{5} \log(f)^{5} - 5\, b^{4} x \log(f)^{4} + 20\, b^{3} x^{2} \log(f)^{3} - 60\, b^{2} x^{3} \log(f)^{2} + 120\, b x^{4} \log(f) - 120\, x^{5}\right) f^{\frac{ax+b}{x}}}{b^{6} x^{5} \log(f)^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)/x^7,x, algorithm="fricas")
```

```
[Out] -(b^5*log(f)^5 - 5*b^4*x*log(f)^4 + 20*b^3*x^2*log(f)^3 - 60*b^2*x^3*log(f)
^2 + 120*b*x^4*log(f) - 120*x^5)*f^((a*x + b)/x)/(b^6*x^5*log(f)^6)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+\frac{b}{x}}}{x^{7}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)/x^7,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x)/x^7, x)
```

maple [A] time = 0.03, size = 142, normalized size = 1.84

$$\frac{-\frac{x\,\mathrm{e}^{\left(a+\frac{b}{x}\right)\ln(f)}}{b\ln(f)} + \frac{5x^{2}\mathrm{e}^{\left(a+\frac{b}{x}\right)\ln(f)}}{b^{2}\ln(f)^{2}} - \frac{20x^{3}\mathrm{e}^{\left(a+\frac{b}{x}\right)\ln(f)}}{b^{3}\ln(f)^{3}} + \frac{60x^{4}\mathrm{e}^{\left(a+\frac{b}{x}\right)\ln(f)}}{b^{4}\ln(f)^{4}} - \frac{120x^{5}\mathrm{e}^{\left(a+\frac{b}{x}\right)\ln(f)}}{b^{5}\ln(f)^{5}} + \frac{120x^{6}\mathrm{e}^{\left(a+\frac{b}{x}\right)\ln(f)}}{b^{6}\ln(f)^{6}}}{x^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x)/x^7,x)
```

```
[Out] (120/b^6/ln(f)^6*x^6*exp((a+b/x)*ln(f))-120/b^5*x^5*exp((a+b/x)*ln(f))/ln(f
)^5+60/b^4*x^4*exp((a+b/x)*ln(f))/ln(f)^4-20/b^3*x^3*exp((a+b/x)*ln(f))/ln(
f)^3+5/b^2*x^2*exp((a+b/x)*ln(f))/ln(f)^2-1/b*x*exp((a+b/x)*ln(f))/ln(f))/x
^6
```

maxima [C] time = 1.29, size = 21, normalized size = 0.27

$$\frac{f^{a}\Gamma\left(6, -\frac{b\log(f)}{x}\right)}{b^{6}\log(f)^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x)/x^7,x, algorithm="maxima")
```

```
[Out] f^a*gamma(6, -b*log(f)/x)/(b^6*log(f)^6)
```

mupad [B] time = 3.65, size = 81, normalized size = 1.05

$$-\frac{f^{a+\frac{b}{x}}\left(\frac{1}{b\ln(f)}+\frac{20x^2}{b^3\ln(f)^3}-\frac{60x^3}{b^4\ln(f)^4}+\frac{120x^4}{b^5\ln(f)^5}-\frac{120x^5}{b^6\ln(f)^6}-\frac{5x}{b^2\ln(f)^2}\right)}{x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x)/x^7,x)
```

```
[Out] -(f^(a + b/x)*(1/(b*log(f)) + (20*x^2)/(b^3*log(f)^3) - (60*x^3)/(b^4*log(f
)^4) + (120*x^4)/(b^5*log(f)^5) - (120*x^5)/(b^6*log(f)^6) - (5*x)/(b^2*log
(f)^2)))/x^5
```

sympy [A] time = 0.17, size = 80, normalized size = 1.04

$$\frac{f^{a+\frac{b}{x}}\left(-b^5\log(f)^5+5b^4x\log(f)^4-20b^3x^2\log(f)^3+60b^2x^3\log(f)^2-120bx^4\log(f)+120x^5\right)}{b^6x^5\log(f)^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x)/x**7,x)
```

```
[Out] f**(a + b/x)*(-b**5*log(f)**5 + 5*b**4*x*log(f)**4 - 20*b**3*x**2*log(f)**3
 + 60*b**2*x**3*log(f)**2 - 120*b*x**4*log(f) + 120*x**5)/(b**6*x**5*log(f)
**6)
```

3.128 $\int f^{a+\frac{b}{x^2}} x^m \, dx$

Optimal. Leaf size=46

$$\frac{1}{2} f^a x^{m+1} \left(-\frac{b \log(f)}{x^2}\right)^{\frac{m+1}{2}} \Gamma\left(\frac{1}{2}(-m-1), -\frac{b \log(f)}{x^2}\right)$$

```
[Out] 1/2*f^a*x^(1+m)*GAMMA(-1/2-1/2*m,-b*ln(f)/x^2)*(-b*ln(f)/x^2)^(1/2+1/2*m)
```

Rubi [A] time = 0.02, antiderivative size = 46, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2218}

$$\frac{1}{2} f^a x^{m+1} \left(-\frac{b \log(f)}{x^2}\right)^{\frac{m+1}{2}} \text{Gamma}\left(\frac{1}{2}(-m-1), -\frac{b \log(f)}{x^2}\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2)*x^m,x]
```

```
[Out] (f^a*x^(1 + m)*Gamma[(-1 - m)/2, -((b*Log[f])/x^2)]*(-((b*Log[f])/x^2))^((1
 + m)/2))/2
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+\frac{b}{x^2}} x^m \, dx = \frac{1}{2} f^a x^{1+m} \Gamma\left(\frac{1}{2}(-1-m), -\frac{b \log(f)}{x^2}\right) \left(-\frac{b \log(f)}{x^2}\right)^{\frac{1+m}{2}}$$

Mathematica [A] time = 0.01, size = 46, normalized size = 1.00

$$\frac{1}{2} f^a x^{m+1} \left(-\frac{b \log(f)}{x^2}\right)^{\frac{m+1}{2}} \Gamma\left(\frac{1}{2}(-m-1), -\frac{b \log(f)}{x^2}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^2)*x^m,x]
```

```
[Out] (f^a*x^(1 + m)*Gamma[(-1 - m)/2, -((b*Log[f])/x^2)]*(-((b*Log[f])/x^2))^((1
 + m)/2))/2
```

fricas [F] time = 0.45, size = 0, normalized size = 0.00

$$\text{integral}\left(f^{\frac{ax^2+b}{x^2}}x^m, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^m,x, algorithm="fricas")
```

```
[Out] integral(f^((a*x^2 + b)/x^2)*x^m, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x^2}}x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^m,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^2)*x^m, x)
```

maple [B] time = 0.06, size = 169, normalized size = 3.67

$$-\frac{\left(\frac{2b\,x^{m-1}(-b)^{-\frac{m}{2}-\frac{1}{2}}\left(-\frac{b\ln(f)}{x^2}\right)^{\frac{m}{2}-\frac{1}{2}}\ln(f)^{-\frac{m}{2}+\frac{1}{2}}\Gamma\left(-\frac{m}{2}+\frac{1}{2}\right)}{m+1}-\frac{2b\,x^{m-1}(-b)^{-\frac{m}{2}-\frac{1}{2}}\left(-\frac{b\ln(f)}{x^2}\right)^{\frac{m}{2}-\frac{1}{2}}\ln(f)^{-\frac{m}{2}+\frac{1}{2}}\Gamma\left(-\frac{m}{2}+\frac{1}{2},-\frac{b\ln(f)}{x^2}\right)}{m+1}-\frac{2x^{m+1}(-b)^{-\frac{m}{2}-\frac{1}{2}}}{m+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2)*x^m,x)
```

```
[Out] -1/2*f^a*(-b)^(1/2*m+1/2)*ln(f)^(1/2*m+1/2)*(2/(m+1)*x^(m-1)*(-b)^(-1/2*m-1
/2)*ln(f)^(1/2-1/2*m)*b*(-b*ln(f)/x^2)^(-1/2+1/2*m)*GAMMA(1/2-1/2*m)-2/(m+1
)*x^(m+1)*(-b)^(-1/2*m-1/2)*ln(f)^(-1/2*m-1/2)*exp(b*ln(f)/x^2)-2/(m+1)*x^(
m-1)*(-b)^(-1/2*m-1/2)*ln(f)^(1/2-1/2*m)*b*(-b*ln(f)/x^2)^(-1/2+1/2*m)*GAMM
A(1/2-1/2*m,-b*ln(f)/x^2))
```

maxima [A] time = 1.37, size = 38, normalized size = 0.83

$$\frac{1}{2}\, f^{a} x^{m+1} \left(-\frac{b\log(f)}{x^2}\right)^{\frac{1}{2}\,m+\frac{1}{2}} \Gamma\left(-\frac{1}{2}\,m-\frac{1}{2}, -\frac{b\log(f)}{x^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^m,x, algorithm="maxima")
```

```
[Out] 1/2*f^a*x^(m + 1)*(-b*log(f)/x^2)^(1/2*m + 1/2)*gamma(-1/2*m - 1/2, -b*log(
f)/x^2)
```

mupad [B] time = 3.51, size = 54, normalized size = 1.17

$$\frac{f^{a}\, x^{m+1}\, \mathrm{e}^{\frac{b\,\ln(f)}{2\,x^2}}\, \mathrm{M}_{\frac{m}{4}+\frac{3}{4},-\frac{m}{4}-\frac{1}{4}}\left(\frac{b\,\ln(f)}{x^2}\right) \left(\frac{b\,\ln(f)}{x^2}\right)^{\frac{m}{4}-\frac{1}{4}}}{m+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)*x^m,x)
```

```
[Out] (f^a*x^(m + 1)*exp((b*log(f))/(2*x^2))*whittakerM(m/4 + 3/4, - m/4 - 1/4, (
b*log(f))/x^2)*((b*log(f))/x^2)^(m/4 - 1/4))/(m + 1)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x^2}} x^m\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)*x**m,x)
```

```
[Out] Integral(f**(a + b/x**2)*x**m, x)
```

3.129 $\int f^{a+\frac{b}{x^2}} x^9 \, dx$

Optimal. Leaf size=24

$$-\frac{1}{2}b^5 f^a \log^5(f)\Gamma\left(-5,-\frac{b\log(f)}{x^2}\right)$$

```
[Out] 1/2*f^a*x^10*Ei(6,-b*ln(f)/x^2)
```

Rubi [A] time = 0.02, antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2218}

$$-\frac{1}{2}b^5 f^a \log^5(f)\text{Gamma}\left(-5,-\frac{b\log(f)}{x^2}\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2)*x^9,x]
```

```
[Out] -(b^5*f^a*Gamma[-5, -((b*Log[f])/x^2)]*Log[f]^5)/2
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+\frac{b}{x^2}} x^9 \, dx = -\frac{1}{2}b^5 f^a \Gamma\left(-5,-\frac{b\log(f)}{x^2}\right)\log^5(f)$$

Mathematica [A] time = 0.00, size = 24, normalized size = 1.00

$$-\frac{1}{2}b^5 f^a \log^5(f)\Gamma\left(-5,-\frac{b\log(f)}{x^2}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^2)*x^9,x]
```

```
[Out] -1/2*(b^5*f^a*Gamma[-5, -((b*Log[f])/x^2)]*Log[f]^5)
```

fricas [B] time = 0.42, size = 84, normalized size = 3.50

$$-\frac{1}{240}\,b^5 f^a \mathrm{Ei}\left(\frac{b\log(f)}{x^2}\right)\log(f)^5+\frac{1}{240}\left(24\,x^{10}+6\,bx^8\log(f)+2\,b^2x^6\log(f)^2+b^3x^4\log(f)^3+b^4x^2\log(f)^4\right)f^{\frac{ax^2+b}{x^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^9,x, algorithm="fricas")
```

```
[Out] -1/240*b^5*f^a*Ei(b*log(f)/x^2)*log(f)^5 + 1/240*(24*x^10 + 6*b*x^8*log(f)
+ 2*b^2*x^6*log(f)^2 + b^3*x^4*log(f)^3 + b^4*x^2*log(f)^4)*f^((a*x^2 + b)/
x^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x^2}}x^9\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^9,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^2)*x^9, x)
```

maple [B] time = 0.08, size = 123, normalized size = 5.12

$$\frac{b^5 f^a \,\mathrm{Ei}\left(1,-\frac{b\ln(f)}{x^2}\right)\ln(f)^5}{240}+\frac{b^4x^2 f^a f^{\frac{b}{x^2}}\ln(f)^4}{240}+\frac{b^3x^4 f^a f^{\frac{b}{x^2}}\ln(f)^3}{240}+\frac{b^2x^6 f^a f^{\frac{b}{x^2}}\ln(f)^2}{120}+\frac{b\,x^8 f^a f^{\frac{b}{x^2}}\ln(f)}{40}+\frac{x^{10} f^a f^{\frac{b}{x^2}}}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2)*x^9,x)
```

```
[Out] 1/10*f^a*x^10*f^(b/x^2)+1/40*f^a*ln(f)*b*x^8*f^(b/x^2)+1/120*f^a*ln(f)^2*b^
2*x^6*f^(b/x^2)+1/240*f^a*ln(f)^3*b^3*x^4*f^(b/x^2)+1/240*f^a*ln(f)^4*b^4*x
^2*f^(b/x^2)+1/240*f^a*ln(f)^5*b^5*Ei(1,-b/x^2*ln(f))
```

maxima [B] time = 1.32, size = 22, normalized size = 0.92

$$-\frac{1}{2}\,b^5 f^a \Gamma\left(-5,-\frac{b\log(f)}{x^2}\right)\log(f)^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^9,x, algorithm="maxima")
```

```
[Out] -1/2*b^5*f^a*gamma(-5, -b*log(f)/x^2)*log(f)^5
```

mupad [B] time = 3.79, size = 102, normalized size = 4.25

$$\frac{b^5 f^a \ln(f)^5 \operatorname{expint}\left(-\frac{b \ln(f)}{x^2}\right)}{240}+\frac{b^5 f^a f^{\frac{b}{x^2}} \ln(f)^5 \left(\frac{x^2}{120\, b\, \ln(f)}+\frac{x^4}{120\, b^2 \ln(f)^2}+\frac{x^6}{60\, b^3 \ln(f)^3}+\frac{x^8}{20\, b^4 \ln(f)^4}+\frac{x^{10}}{5\, b^5 \ln(f)^5}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)*x^9,x)
```

```
[Out] (b^5*f^a*log(f)^5*expint(-(b*log(f))/x^2))/240 + (b^5*f^a*f^(b/x^2)*log(f)^
5*(x^2/(120*b*log(f)) + x^4/(120*b^2*log(f)^2) + x^6/(60*b^3*log(f)^3) + x^
8/(20*b^4*log(f)^4) + x^10/(5*b^5*log(f)^5)))/2
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x^2}} x^9\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)*x**9,x)
```

```
[Out] Integral(f**(a + b/x**2)*x**9, x)
```

3.130 $\int f^{a+\frac{b}{x^2}} x^7 \, dx$

Optimal. Leaf size=24

$$\frac{1}{2} b^4 f^a \log^4(f) \Gamma\left(-4, -\frac{b \log(f)}{x^2}\right)$$

```
[Out] 1/2*f^a*x^8*Ei(5,-b*ln(f)/x^2)
```

Rubi [A] time = 0.02, antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2218}

$$\frac{1}{2} b^4 f^a \log^4(f) \text{Gamma}\left(-4, -\frac{b \log(f)}{x^2}\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2)*x^7,x]
```

```
[Out] (b^4*f^a*Gamma[-4, -((b*Log[f])/x^2)]*Log[f]^4)/2
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+\frac{b}{x^2}} x^7 \, dx = \frac{1}{2} b^4 f^a \Gamma\left(-4, -\frac{b \log(f)}{x^2}\right) \log^4(f)$$

Mathematica [A] time = 0.00, size = 24, normalized size = 1.00

$$\frac{1}{2} b^4 f^a \log^4(f) \Gamma\left(-4, -\frac{b \log(f)}{x^2}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^2)*x^7,x]
```

```
[Out] (b^4*f^a*Gamma[-4, -((b*Log[f])/x^2)]*Log[f]^4)/2
```

fricas [B] time = 0.42, size = 72, normalized size = 3.00

$$-\frac{1}{48}\,b^4 f^a \mathrm{Ei}\left(\frac{b\log(f)}{x^2}\right)\log(f)^4+\frac{1}{48}\left(6\,x^8+2\,bx^6\log(f)+b^2x^4\log(f)^2+b^3x^2\log(f)^3\right)f^{\frac{ax^2+b}{x^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^7,x, algorithm="fricas")
[Out] -1/48*b^4*f^a*Ei(b*log(f)/x^2)*log(f)^4 + 1/48*(6*x^8 + 2*b*x^6*log(f) + b^
2*x^4*log(f)^2 + b^3*x^2*log(f)^3)*f^((a*x^2 + b)/x^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x^2}}x^7\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^7,x, algorithm="giac")
[Out] integrate(f^(a + b/x^2)*x^7, x)
```

maple [B] time = 0.07, size = 101, normalized size = 4.21

$$\frac{b^4 f^a\,\mathrm{Ei}\left(1,-\frac{b\ln(f)}{x^2}\right)\ln(f)^4}{48}+\frac{b^3x^2 f^a f^{\frac{b}{x^2}}\ln(f)^3}{48}+\frac{b^2x^4 f^a f^{\frac{b}{x^2}}\ln(f)^2}{48}+\frac{b\,x^6 f^a f^{\frac{b}{x^2}}\ln(f)}{24}+\frac{x^8 f^a f^{\frac{b}{x^2}}}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2)*x^7,x)
[Out] 1/8*f^a*x^8*f^(b/x^2)+1/24*f^a*ln(f)*b*x^6*f^(b/x^2)+1/48*f^a*ln(f)^2*b^2*x
^4*f^(b/x^2)+1/48*f^a*ln(f)^3*b^3*x^2*f^(b/x^2)+1/48*f^a*ln(f)^4*b^4*Ei(1,-
b/x^2*ln(f))
```

maxima [B] time = 1.35, size = 22, normalized size = 0.92

$$\frac{1}{2}\,b^4 f^a\Gamma\left(-4,-\frac{b\log(f)}{x^2}\right)\log(f)^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^7,x, algorithm="maxima")
```

```
[Out] 1/2*b^4*f^a*gamma(-4, -b*log(f)/x^2)*log(f)^4
```

mupad [B] time = 3.77, size = 90, normalized size = 3.75

$$\frac{b^4 f^a \ln(f)^4 \operatorname{expint}\left(-\frac{b \ln(f)}{x^2}\right)}{48} + \frac{b^4 f^a f^{\frac{b}{x^2}} \ln(f)^4 \left(\frac{x^2}{24 b \ln(f)} + \frac{x^4}{24 b^2 \ln(f)^2} + \frac{x^6}{12 b^3 \ln(f)^3} + \frac{x^8}{4 b^4 \ln(f)^4}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)*x^7,x)
```

```
[Out] (b^4*f^a*log(f)^4*expint(-(b*log(f))/x^2))/48 + (b^4*f^a*f^(b/x^2)*log(f)^4
*(x^2/(24*b*log(f)) + x^4/(24*b^2*log(f)^2) + x^6/(12*b^3*log(f)^3) + x^8/(
4*b^4*log(f)^4)))/2
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x^2}} x^7 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)*x**7,x)
```

```
[Out] Integral(f**(a + b/x**2)*x**7, x)
```

3.131 $\int f^{a+\frac{b}{x^2}}x^5\,dx$

Optimal. Leaf size=81

$$-\frac{1}{12}b^3f^a\log^3(f)\text{Ei}\left(\frac{b\log(f)}{x^2}\right)+\frac{1}{12}b^2x^2\log^2(f)f^{a+\frac{b}{x^2}}+\frac{1}{6}x^6f^{a+\frac{b}{x^2}}+\frac{1}{12}bx^4\log(f)f^{a+\frac{b}{x^2}}$$

```
[Out] 1/6*f^(a+b/x^2)*x^6+1/12*b*f^(a+b/x^2)*x^4*ln(f)+1/12*b^2*f^(a+b/x^2)*x^2*l
n(f)^2-1/12*b^3*f^a*Ei(b*ln(f)/x^2)*ln(f)^3
```

Rubi [A] time = 0.09, antiderivative size = 81, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2214, 2210}

$$-\frac{1}{12}b^3f^a\log^3(f)\text{Ei}\left(\frac{b\log(f)}{x^2}\right)+\frac{1}{12}b^2x^2\log^2(f)f^{a+\frac{b}{x^2}}+\frac{1}{6}x^6f^{a+\frac{b}{x^2}}+\frac{1}{12}bx^4\log(f)f^{a+\frac{b}{x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2)*x^5,x]
```

```
[Out] (f^(a + b/x^2)*x^6)/6 + (b*f^(a + b/x^2)*x^4*Log[f])/12 + (b^2*f^(a + b/x^2
)*x^2*Log[f]^2)/12 - (b^3*f^a*ExpIntegralEi[(b*Log[f])/x^2]*Log[f]^3)/12
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$
\begin{aligned}
\int f^{a+\frac{b}{x^2}} x^5 \, dx &= \frac{1}{6} f^{a+\frac{b}{x^2}} x^6 + \frac{1}{3}(b \log(f)) \int f^{a+\frac{b}{x^2}} x^3 \, dx \\
&= \frac{1}{6} f^{a+\frac{b}{x^2}} x^6 + \frac{1}{12} b f^{a+\frac{b}{x^2}} x^4 \log(f) + \frac{1}{6}\left(b^2 \log^2(f)\right) \int f^{a+\frac{b}{x^2}} x \, dx \\
&= \frac{1}{6} f^{a+\frac{b}{x^2}} x^6 + \frac{1}{12} b f^{a+\frac{b}{x^2}} x^4 \log(f) + \frac{1}{12} b^2 f^{a+\frac{b}{x^2}} x^2 \log^2(f) + \frac{1}{6}\left(b^3 \log^3(f)\right) \int \frac{f^{a+\frac{b}{x^2}}}{x} \, dx \\
&= \frac{1}{6} f^{a+\frac{b}{x^2}} x^6 + \frac{1}{12} b f^{a+\frac{b}{x^2}} x^4 \log(f) + \frac{1}{12} b^2 f^{a+\frac{b}{x^2}} x^2 \log^2(f) - \frac{1}{12} b^3 f^a \text{Ei}\left(\frac{b \log(f)}{x^2}\right) \log^3(f)
\end{aligned}
$$

Mathematica [A] time = 0.02, size = 57, normalized size = 0.70

$$
\frac{1}{12} f^a \left(x^2 f^{\frac{b}{x^2}} \left(b^2 \log^2(f) + b x^2 \log(f) + 2 x^4\right) - b^3 \log^3(f) \text{Ei}\left(\frac{b \log(f)}{x^2}\right)\right)
$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^2)*x^5,x]
```

```
[Out] (f^a*(-(b^3*ExpIntegralEi[(b*Log[f])/x^2]*Log[f]^3) + f^(b/x^2)*x^2*(2*x^4
+ b*x^2*Log[f] + b^2*Log[f]^2)))/12
```

fricas [A] time = 0.42, size = 60, normalized size = 0.74

$$
-\frac{1}{12} b^3 f^a \text{Ei}\left(\frac{b \log(f)}{x^2}\right) \log(f)^3 + \frac{1}{12}\left(2 x^6 + b x^4 \log(f) + b^2 x^2 \log(f)^2\right) f^{\frac{a x^2 + b}{x^2}}
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^5,x, algorithm="fricas")
```

```
[Out] -1/12*b^3*f^a*Ei(b*log(f)/x^2)*log(f)^3 + 1/12*(2*x^6 + b*x^4*log(f) + b^2*
x^2*log(f)^2)*f^((a*x^2 + b)/x^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$
\int f^{a+\frac{b}{x^2}} x^5 \, dx
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^5,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^2)*x^5, x)
```

maple [A] time = 0.06, size = 79, normalized size = 0.98

$$\frac{b^3 f^a \operatorname{Ei}\left(1, -\frac{b\ln(f)}{x^2}\right)\ln(f)^3}{12} + \frac{b^2 x^2 f^a f^{\frac{b}{x^2}}\ln(f)^2}{12} + \frac{b\,x^4 f^a f^{\frac{b}{x^2}}\ln(f)}{12} + \frac{x^6 f^a f^{\frac{b}{x^2}}}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2)*x^5,x)
```

```
[Out] 1/6*f^a*x^6*f^(b/x^2)+1/12*f^a*ln(f)*b*x^4*f^(b/x^2)+1/12*f^a*ln(f)^2*b^2*x
^2*f^(b/x^2)+1/12*f^a*ln(f)^3*b^3*Ei(1,-b/x^2*ln(f))
```

maxima [A] time = 1.48, size = 22, normalized size = 0.27

$$-\frac{1}{2}\,b^3 f^a \Gamma\left(-3, -\frac{b\log(f)}{x^2}\right)\log(f)^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^5,x, algorithm="maxima")
```

```
[Out] -1/2*b^3*f^a*gamma(-3, -b*log(f)/x^2)*log(f)^3
```

mupad [B] time = 3.74, size = 69, normalized size = 0.85

$$\frac{b^3\,f^a\,\ln(f)^3\,\left(f^{\frac{b}{x^2}}\,\left(\frac{x^2}{6\,b\,\ln(f)}+\frac{x^4}{6\,b^2\,\ln(f)^2}+\frac{x^6}{3\,b^3\,\ln(f)^3}\right)+\frac{\operatorname{expint}\left(-\frac{b\,\ln(f)}{x^2}\right)}{6}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)*x^5,x)
```

```
[Out] (b^3*f^a*log(f)^3*(f^(b/x^2)*(x^2/(6*b*log(f)) + x^4/(6*b^2*log(f)^2) + x^6
/(3*b^3*log(f)^3)) + expint(-(b*log(f))/x^2)/6))/2
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x^2}} x^5\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)*x**5,x)
```

```
[Out] Integral(f**(a + b/x**2)*x**5, x)
```

3.132 $\int f^{a+\frac{b}{x^2}} x^3 \, dx$

Optimal. Leaf size=58

$$-\frac{1}{4}b^2 f^a \log^2(f)\text{Ei}\left(\frac{b\log(f)}{x^2}\right)+\frac{1}{4}bx^2\log(f)f^{a+\frac{b}{x^2}}+\frac{1}{4}x^4 f^{a+\frac{b}{x^2}}$$

```
[Out] 1/4*f^(a+b/x^2)*x^4+1/4*b*f^(a+b/x^2)*x^2*ln(f)-1/4*b^2*f^a*Ei(b*ln(f)/x^2)
*ln(f)^2
```

Rubi [A] time = 0.06, antiderivative size = 58, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2214, 2210}

$$-\frac{1}{4}b^2 f^a \log^2(f)\text{Ei}\left(\frac{b\log(f)}{x^2}\right)+\frac{1}{4}x^4 f^{a+\frac{b}{x^2}}+\frac{1}{4}bx^2\log(f)f^{a+\frac{b}{x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2)*x^3,x]
```

```
[Out] (f^(a + b/x^2)*x^4)/4 + (b*f^(a + b/x^2)*x^2*Log[f])/4 - (b^2*f^a*ExpIntegr
alEi[(b*Log[f])/x^2]*Log[f]^2)/4
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\int f^{a+\frac{b}{x^2}}x^3\,dx = \frac{1}{4}f^{a+\frac{b}{x^2}}x^4 + \frac{1}{2}(b\log(f))\int f^{a+\frac{b}{x^2}}x\,dx$$
$$= \frac{1}{4}f^{a+\frac{b}{x^2}}x^4 + \frac{1}{4}bf^{a+\frac{b}{x^2}}x^2\log(f) + \frac{1}{2}\left(b^2\log^2(f)\right)\int \frac{f^{a+\frac{b}{x^2}}}{x}\,dx$$
$$= \frac{1}{4}f^{a+\frac{b}{x^2}}x^4 + \frac{1}{4}bf^{a+\frac{b}{x^2}}x^2\log(f) - \frac{1}{4}b^2f^a\text{Ei}\left(\frac{b\log(f)}{x^2}\right)\log^2(f)$$

Mathematica [A] time = 0.01, size = 44, normalized size = 0.76

$$\frac{1}{4}f^a\left(x^2f^{\frac{b}{x^2}}\left(b\log(f)+x^2\right)-b^2\log^2(f)\text{Ei}\left(\frac{b\log(f)}{x^2}\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^2)*x^3,x]
```

```
[Out] (f^a*(-(b^2*ExpIntegralEi[(b*Log[f])/x^2]*Log[f]^2) + f^(b/x^2)*x^2*(x^2 +
b*Log[f])))/4
```

fricas [A] time = 0.42, size = 47, normalized size = 0.81

$$-\frac{1}{4}\,b^2f^a\text{Ei}\left(\frac{b\log(f)}{x^2}\right)\log(f)^2+\frac{1}{4}\left(x^4+bx^2\log(f)\right)f^{\frac{ax^2+b}{x^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^3,x, algorithm="fricas")
```

```
[Out] -1/4*b^2*f^a*Ei(b*log(f)/x^2)*log(f)^2 + 1/4*(x^4 + b*x^2*log(f))*f^((a*x^2
 + b)/x^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x^2}}x^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^3,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^2)*x^3, x)
```

maple [A] time = 0.05, size = 57, normalized size = 0.98

$$\frac{b^2 f^a \operatorname{Ei}\left(1, -\frac{b\ln(f)}{x^2}\right)\ln(f)^2}{4} + \frac{b\,x^2 f^a f^{\frac{b}{x^2}}\ln(f)}{4} + \frac{x^4 f^a f^{\frac{b}{x^2}}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2)*x^3,x)
```

```
[Out] 1/4*f^a*x^4*f^(b/x^2)+1/4*f^a*ln(f)*b*x^2*f^(b/x^2)+1/4*f^a*ln(f)^2*b^2*Ei(
1,-b/x^2*ln(f))
```

maxima [A] time = 1.21, size = 22, normalized size = 0.38

$$\frac{1}{2}\,b^2 f^a \Gamma\left(-2, -\frac{b\log(f)}{x^2}\right)\log(f)^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^3,x, algorithm="maxima")
```

```
[Out] 1/2*b^2*f^a*gamma(-2, -b*log(f)/x^2)*log(f)^2
```

mupad [B] time = 3.65, size = 57, normalized size = 0.98

$$\frac{b^2\,f^a\,\ln(f)^2\,\left(f^{\frac{b}{x^2}}\,\left(\frac{x^2}{2\,b\,\ln(f)}+\frac{x^4}{2\,b^2\,\ln(f)^2}\right)+\frac{\operatorname{expint}\left(-\frac{b\,\ln(f)}{x^2}\right)}{2}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)*x^3,x)
```

```
[Out] (b^2*f^a*log(f)^2*(f^(b/x^2)*(x^2/(2*b*log(f)) + x^4/(2*b^2*log(f)^2)) + ex
pint(-(b*log(f))/x^2)/2))/2
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x^2}}x^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)*x**3,x)
```

```
[Out] Integral(f**(a + b/x**2)*x**3, x)
```

3.133 $\int f^{a+\frac{b}{x^2}} x \, dx$

Optimal. Leaf size=35

$$\frac{1}{2}x^2 f^{a+\frac{b}{x^2}} - \frac{1}{2}bf^a \log(f)\text{Ei}\left(\frac{b\log(f)}{x^2}\right)$$

```
[Out] 1/2*f^(a+b/x^2)*x^2-1/2*b*f^a*Ei(b*ln(f)/x^2)*ln(f)
```

Rubi [A] time = 0.04, antiderivative size = 35, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182, Rules used = {2214, 2210}

$$\frac{1}{2}x^2 f^{a+\frac{b}{x^2}} - \frac{1}{2}bf^a \log(f)\text{Ei}\left(\frac{b\log(f)}{x^2}\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2)*x,x]
```

```
[Out] (f^(a + b/x^2)*x^2)/2 - (b*f^a*ExpIntegralEi[(b*Log[f])/x^2]*Log[f])/2
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\begin{aligned}
\int f^{a+\frac{b}{x^2}} x \, dx &= \frac{1}{2}f^{a+\frac{b}{x^2}}x^2 + (b\log(f))\int \frac{f^{a+\frac{b}{x^2}}}{x} \, dx \\
&= \frac{1}{2}f^{a+\frac{b}{x^2}}x^2 - \frac{1}{2}bf^a\text{Ei}\left(\frac{b\log(f)}{x^2}\right)\log(f)
\end{aligned}$$

Mathematica [A] time = 0.01, size = 32, normalized size = 0.91

$$\frac{1}{2}f^a\left(x^2f^{\frac{b}{x^2}}-b\log(f)\text{Ei}\left(\frac{b\log(f)}{x^2}\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^2)*x,x]
```

```
[Out] (f^a*(f^(b/x^2)*x^2 - b*ExpIntegralEi[(b*Log[f])/x^2]*Log[f]))/2
```

fricas [A] time = 0.43, size = 35, normalized size = 1.00

$$-\frac{1}{2}\,bf^a\text{Ei}\left(\frac{b\log(f)}{x^2}\right)\log(f)+\frac{1}{2}\,f^{\frac{ax^2+b}{x^2}}x^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x,x, algorithm="fricas")
```

```
[Out] -1/2*b*f^a*Ei(b*log(f)/x^2)*log(f) + 1/2*f^((a*x^2 + b)/x^2)*x^2
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x^2}}x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^2)*x, x)
```

maple [A] time = 0.04, size = 35, normalized size = 1.00

$$\frac{b\,f^a\,\text{Ei}\left(1,-\frac{b\ln(f)}{x^2}\right)\ln(f)}{2}+\frac{x^2f^af^{\frac{b}{x^2}}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2)*x,x)
```

```
[Out] 1/2*f^a*x^2*f^(b/x^2)+1/2*f^a*ln(f)*b*Ei(1,-b/x^2*ln(f))
```

maxima [A] time = 1.22, size = 18, normalized size = 0.51

$$-\frac{1}{2}\,bf^a\Gamma\left(-1,-\frac{b\log(f)}{x^2}\right)\log(f)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x,x, algorithm="maxima")
```

```
[Out] -1/2*b*f^a*gamma(-1, -b*log(f)/x^2)*log(f)
```

mupad [B] time = 3.57, size = 33, normalized size = 0.94

$$\frac{f^a\,f^{\frac{b}{x^2}}\,x^2}{2}+\frac{b\,f^a\,\ln(f)\,\mathrm{expint}\left(-\frac{b\,\ln(f)}{x^2}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)*x,x)
```

```
[Out] (f^a*f^(b/x^2)*x^2)/2 + (b*f^a*log(f)*expint(-(b*log(f))/x^2))/2
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x^2}}x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)*x,x)
```

```
[Out] Integral(f**(a + b/x**2)*x, x)
```

3.134 $\int \frac{f^{a+\frac{b}{x^2}}}{x}\,dx$

Optimal. Leaf size=15

$$-\frac{1}{2}f^a\text{Ei}\left(\frac{b\log(f)}{x^2}\right)$$

```
[Out] -1/2*f^a*Ei(b*ln(f)/x^2)
```

Rubi [A] time = 0.02, antiderivative size = 15, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2210}

$$-\frac{1}{2}f^a\text{Ei}\left(\frac{b\log(f)}{x^2}\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2)/x,x]
```

```
[Out] -(f^a*ExpIntegralEi[(b*Log[f])/x^2])/2
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x^2}}}{x}\,dx = -\frac{1}{2}f^a\text{Ei}\left(\frac{b\log(f)}{x^2}\right)$$

Mathematica [A] time = 0.00, size = 15, normalized size = 1.00

$$-\frac{1}{2}f^a\text{Ei}\left(\frac{b\log(f)}{x^2}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^2)/x,x]
```

```
[Out] -1/2*(f^a*ExpIntegralEi[(b*Log[f])/x^2])
```

fricas [A] time = 0.43, size = 13, normalized size = 0.87

$$-\frac{1}{2} f^{a} \mathrm{Ei}\left(\frac{b \log(f)}{x^{2}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x,x, algorithm="fricas")
```

```
[Out] -1/2*f^a*Ei(b*log(f)/x^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+\frac{b}{x^{2}}}}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^2)/x, x)
```

maple [A] time = 0.04, size = 16, normalized size = 1.07

$$\frac{f^{a} \mathrm{Ei}\left(1, -\frac{b \ln(f)}{x^{2}}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2)/x,x)
```

```
[Out] 1/2*f^a*Ei(1,-b/x^2*ln(f))
```

maxima [A] time = 1.25, size = 13, normalized size = 0.87

$$-\frac{1}{2} f^{a} \mathrm{Ei}\left(\frac{b \log(f)}{x^{2}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x,x, algorithm="maxima")
```

```
[Out] -1/2*f^a*Ei(b*log(f)/x^2)
```

mupad [B] time = 3.50, size = 13, normalized size = 0.87

$$-\frac{f^{a} \mathrm{ei}\left(\frac{b \ln(f)}{x^{2}}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)/x,x)
```

```
[Out] -(f^a*ei((b*log(f))/x^2))/2
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+\frac{b}{x^2}}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)/x,x)
```

```
[Out] Integral(f**(a + b/x**2)/x, x)
```

3.135 $\int \frac{f^{a+\frac{b}{x^2}}}{x^3} dx$

Optimal. Leaf size=20

$$-\frac{f^{a+\frac{b}{x^2}}}{2b\log(f)}$$

```
[Out] -1/2*f^(a+b/x^2)/b/ln(f)
```

Rubi [A] time = 0.02, antiderivative size = 20, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2209}

$$-\frac{f^{a+\frac{b}{x^2}}}{2b\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2)/x^3,x]
```

```
[Out] -f^(a + b/x^2)/(2*b*Log[f])
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x^2}}}{x^3} dx = -\frac{f^{a+\frac{b}{x^2}}}{2b\log(f)}$$

Mathematica [A] time = 0.00, size = 20, normalized size = 1.00

$$-\frac{f^{a+\frac{b}{x^2}}}{2b\log(f)}$$

Antiderivative was successfully verified.

[In] Integrate[f^(a + b/x^2)/x^3,x]

[Out] -1/2*f^(a + b/x^2)/(b*Log[f])

fricas [A] time = 0.41, size = 22, normalized size = 1.10

$$-\frac{f^{\frac{ax^2+b}{x^2}}}{2\,b\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f^(a+b/x^2)/x^3,x, algorithm="fricas")

[Out] -1/2*f^((a*x^2 + b)/x^2)/(b*log(f))

giac [A] time = 0.19, size = 22, normalized size = 1.10

$$-\frac{f^{\frac{ax^2+b}{x^2}}}{2\,b\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f^(a+b/x^2)/x^3,x, algorithm="giac")

[Out] -1/2*f^((a*x^2 + b)/x^2)/(b*log(f))

maple [A] time = 0.00, size = 19, normalized size = 0.95

$$-\frac{f^{a+\frac{b}{x^2}}}{2b\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(f^(a+b/x^2)/x^3,x)

[Out] -1/2*f^(a+b/x^2)/b/ln(f)

maxima [A] time = 1.01, size = 18, normalized size = 0.90

$$-\frac{f^{a+\frac{b}{x^2}}}{2\,b\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f^(a+b/x^2)/x^3,x, algorithm="maxima")

```
[Out] -1/2*f^(a + b/x^2)/(b*log(f))
```

mupad [B] time = 3.45, size = 18, normalized size = 0.90

$$-\frac{f^{a+\frac{b}{x^2}}}{2\,b\,\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)/x^3,x)
```

```
[Out] -f^(a + b/x^2)/(2*b*log(f))
```

sympy [A] time = 0.12, size = 29, normalized size = 1.45

$$\begin{cases} -\frac{f^{a+\frac{b}{x^2}}}{2b\log{(f)}} & \text{for}\ 2b\log{(f)} \neq 0 \\ -\frac{1}{2x^2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)/x**3,x)
```

```
[Out] Piecewise((-f**(a + b/x**2)/(2*b*log(f)), Ne(2*b*log(f), 0)), (-1/(2*x**2),
 True))
```

3.136 $\int \frac{f^{a+\frac{b}{x^2}}}{x^5} dx$

Optimal. Leaf size=44

$$\frac{f^{a+\frac{b}{x^2}}}{2b^2\log^2(f)} - \frac{f^{a+\frac{b}{x^2}}}{2bx^2\log(f)}$$

```
[Out] 1/2*f^(a+b/x^2)/b^2/ln(f)^2-1/2*f^(a+b/x^2)/b/x^2/ln(f)
```

Rubi [A] time = 0.05, antiderivative size = 44, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2212, 2209}

$$\frac{f^{a+\frac{b}{x^2}}}{2b^2\log^2(f)} - \frac{f^{a+\frac{b}{x^2}}}{2bx^2\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2)/x^5,x]
```

```
[Out] f^(a + b/x^2)/(2*b^2*Log[f]^2) - f^(a + b/x^2)/(2*b*x^2*Log[f])
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x^2}}}{x^5}\,dx = -\frac{f^{a+\frac{b}{x^2}}}{2bx^2\log(f)} - \frac{\int \frac{f^{a+\frac{b}{x^2}}}{x^3}\,dx}{b\log(f)}$$
$$= \frac{f^{a+\frac{b}{x^2}}}{2b^2\log^2(f)} - \frac{f^{a+\frac{b}{x^2}}}{2bx^2\log(f)}$$

Mathematica [A] time = 0.01, size = 32, normalized size = 0.73

$$\frac{f^{a+\frac{b}{x^2}}\left(x^2-b\log(f)\right)}{2b^2x^2\log^2(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^2)/x^5,x]
[Out] (f^(a + b/x^2)*(x^2 - b*Log[f]))/(2*b^2*x^2*Log[f]^2)
```

fricas [A] time = 0.42, size = 34, normalized size = 0.77

$$\frac{\left(x^2-b\log(f)\right)f^{\frac{ax^2+b}{x^2}}}{2\,b^2x^2\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^5,x, algorithm="fricas")
[Out] 1/2*(x^2 - b*log(f))*f^((a*x^2 + b)/x^2)/(b^2*x^2*log(f)^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+\frac{b}{x^2}}}{x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^5,x, algorithm="giac")
[Out] integrate(f^(a + b/x^2)/x^5, x)
```

maple [A] time = 0.02, size = 52, normalized size = 1.18

$$\frac{-\frac{x^{2} e^{\left(a+\frac{b}{x^{2}}\right) \ln(f)}}{2 b \ln(f)}+\frac{x^{4} e^{\left(a+\frac{b}{x^{2}}\right) \ln(f)}}{2 b^{2} \ln(f)^{2}}}{x^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2)/x^5,x)
```

```
[Out] (1/2/b^2/ln(f)^2*x^4*exp((a+b/x^2)*ln(f))-1/2/b/ln(f)*x^2*exp((a+b/x^2)*ln(
f)))/x^4
```

maxima [C] time = 1.29, size = 22, normalized size = 0.50

$$\frac{f^{a} \Gamma\left(2, -\frac{b \log(f)}{x^{2}}\right)}{2 b^{2} \log(f)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^5,x, algorithm="maxima")
```

```
[Out] 1/2*f^a*gamma(2, -b*log(f)/x^2)/(b^2*log(f)^2)
```

mupad [B] time = 3.44, size = 36, normalized size = 0.82

$$-\frac{f^{a+\frac{b}{x^{2}}} \left(\frac{1}{2 b \ln(f)}-\frac{x^{2}}{2 b^{2} \ln(f)^{2}}\right)}{x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)/x^5,x)
```

```
[Out] -(f^(a + b/x^2)*(1/(2*b*log(f)) - x^2/(2*b^2*log(f)^2)))/x^2
```

sympy [A] time = 0.13, size = 29, normalized size = 0.66

$$\frac{f^{a+\frac{b}{x^{2}}} \left(-b \log(f)+x^{2}\right)}{2 b^{2} x^{2} \log(f)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)/x**5,x)
```

```
[Out] f**(a + b/x**2)*(-b*log(f) + x**2)/(2*b**2*x**2*log(f)**2)
```

3.137 $\int \frac{f^{a+\frac{b}{x^2}}}{x^7} dx$

Optimal. Leaf size=62

$$-\frac{f^{a+\frac{b}{x^2}}}{b^3\log^3(f)}+\frac{f^{a+\frac{b}{x^2}}}{b^2x^2\log^2(f)}-\frac{f^{a+\frac{b}{x^2}}}{2bx^4\log(f)}$$

```
[Out] -f^(a+b/x^2)/b^3/ln(f)^3+f^(a+b/x^2)/b^2/x^2/ln(f)^2-1/2*f^(a+b/x^2)/b/x^4/
ln(f)
```

Rubi [A] time = 0.07, antiderivative size = 62, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2212, 2209}

$$\frac{f^{a+\frac{b}{x^2}}}{b^2x^2\log^2(f)}-\frac{f^{a+\frac{b}{x^2}}}{b^3\log^3(f)}-\frac{f^{a+\frac{b}{x^2}}}{2bx^4\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2)/x^7,x]
```

```
[Out] -(f^(a + b/x^2)/(b^3*Log[f]^3)) + f^(a + b/x^2)/(b^2*x^2*Log[f]^2) - f^(a +
 b/x^2)/(2*b*x^4*Log[f])
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x^2}}}{x^7}\,dx = -\frac{f^{a+\frac{b}{x^2}}}{2bx^4\log(f)} - \frac{2\int \frac{f^{a+\frac{b}{x^2}}}{x^5}\,dx}{b\log(f)}$$
$$= \frac{f^{a+\frac{b}{x^2}}}{b^2x^2\log^2(f)} - \frac{f^{a+\frac{b}{x^2}}}{2bx^4\log(f)} + \frac{2\int \frac{f^{a+\frac{b}{x^2}}}{x^3}\,dx}{b^2\log^2(f)}$$
$$= -\frac{f^{a+\frac{b}{x^2}}}{b^3\log^3(f)} + \frac{f^{a+\frac{b}{x^2}}}{b^2x^2\log^2(f)} - \frac{f^{a+\frac{b}{x^2}}}{2bx^4\log(f)}$$

Mathematica [A] time = 0.01, size = 45, normalized size = 0.73

$$-\frac{f^{a+\frac{b}{x^2}}\left(b^2\log^2(f) - 2bx^2\log(f) + 2x^4\right)}{2b^3x^4\log^3(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^2)/x^7,x]
```

```
[Out] -1/2*(f^(a + b/x^2)*(2*x^4 - 2*b*x^2*Log[f] + b^2*Log[f]^2))/(b^3*x^4*Log[f
]^3)
```

fricas [A] time = 0.42, size = 47, normalized size = 0.76

$$-\frac{\left(2\,x^4 - 2\,bx^2\log(f) + b^2\log(f)^2\right)f^{\frac{ax^2+b}{x^2}}}{2\,b^3x^4\log(f)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^7,x, algorithm="fricas")
```

```
[Out] -1/2*(2*x^4 - 2*b*x^2*log(f) + b^2*log(f)^2)*f^((a*x^2 + b)/x^2)/(b^3*x^4*l
og(f)^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+\frac{b}{x^2}}}{x^7}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^7,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^2)/x^7, x)
```

maple [A] time = 0.03, size = 74, normalized size = 1.19

$$\frac{-\frac{x^2 e^{\left(a+\frac{b}{x^2}\right)\ln(f)}}{2b\ln(f)}+\frac{x^4 e^{\left(a+\frac{b}{x^2}\right)\ln(f)}}{b^2\ln(f)^2}-\frac{x^6 e^{\left(a+\frac{b}{x^2}\right)\ln(f)}}{b^3\ln(f)^3}}{x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2)/x^7,x)
```

```
[Out] (1/b^2*x^4*exp((a+b/x^2)*ln(f))/ln(f)^2-1/b^3/ln(f)^3*x^6*exp((a+b/x^2)*ln(
f))-1/2/b*x^2*exp((a+b/x^2)*ln(f))/ln(f))/x^6
```

maxima [C] time = 1.30, size = 22, normalized size = 0.35

$$-\frac{f^a\Gamma\left(3,-\frac{b\log(f)}{x^2}\right)}{2\,b^3\log(f)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^7,x, algorithm="maxima")
```

```
[Out] -1/2*f^a*gamma(3, -b*log(f)/x^2)/(b^3*log(f)^3)
```

mupad [B] time = 3.55, size = 47, normalized size = 0.76

$$-\frac{f^{a+\frac{b}{x^2}}\left(\frac{1}{2\,b\,\ln(f)}-\frac{x^2}{b^2\ln(f)^2}+\frac{x^4}{b^3\ln(f)^3}\right)}{x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)/x^7,x)
```

```
[Out] -(f^(a + b/x^2)*(1/(2*b*log(f)) - x^2/(b^2*log(f)^2) + x^4/(b^3*log(f)^3)))
/x^4
```

sympy [A] time = 0.15, size = 44, normalized size = 0.71

$$\frac{f^{a+\frac{b}{x^2}}\left(-b^2\log{(f)}^2+2bx^2\log{(f)}-2x^4\right)}{2b^3x^4\log{(f)}^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)/x**7,x)
```

```
[Out] f**(a + b/x**2)*(-b**2*log(f)**2 + 2*b*x**2*log(f) - 2*x**4)/(2*b**3*x**4*l
og(f)**3)
```

3.138 $\int \frac{f^{a+\frac{b}{x^2}}}{x^9} dx$

Optimal. Leaf size=86

$$\frac{3f^{a+\frac{b}{x^2}}}{b^4\log^4(f)} - \frac{3f^{a+\frac{b}{x^2}}}{b^3x^2\log^3(f)} + \frac{3f^{a+\frac{b}{x^2}}}{2b^2x^4\log^2(f)} - \frac{f^{a+\frac{b}{x^2}}}{2bx^6\log(f)}$$

```
[Out] 3*f^(a+b/x^2)/b^4/ln(f)^4-3*f^(a+b/x^2)/b^3/x^2/ln(f)^3+3/2*f^(a+b/x^2)/b^2
/x^4/ln(f)^2-1/2*f^(a+b/x^2)/b/x^6/ln(f)
```

Rubi [A] time = 0.10, antiderivative size = 86, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2212, 2209}

$$\frac{3f^{a+\frac{b}{x^2}}}{2b^2x^4\log^2(f)} - \frac{3f^{a+\frac{b}{x^2}}}{b^3x^2\log^3(f)} + \frac{3f^{a+\frac{b}{x^2}}}{b^4\log^4(f)} - \frac{f^{a+\frac{b}{x^2}}}{2bx^6\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2)/x^9,x]
```

```
[Out] (3*f^(a + b/x^2))/(b^4*Log[f]^4) - (3*f^(a + b/x^2))/(b^3*x^2*Log[f]^3) + (
3*f^(a + b/x^2))/(2*b^2*x^4*Log[f]^2) - f^(a + b/x^2)/(2*b*x^6*Log[f])
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$
\begin{aligned}
\int \frac{f^{a+\frac{b}{x^2}}}{x^9}\,dx &= -\frac{f^{a+\frac{b}{x^2}}}{2bx^6\log(f)} - \frac{3\int \frac{f^{a+\frac{b}{x^2}}}{x^7}\,dx}{b\log(f)} \\
&= \frac{3f^{a+\frac{b}{x^2}}}{2b^2x^4\log^2(f)} - \frac{f^{a+\frac{b}{x^2}}}{2bx^6\log(f)} + \frac{6\int \frac{f^{a+\frac{b}{x^2}}}{x^5}\,dx}{b^2\log^2(f)} \\
&= -\frac{3f^{a+\frac{b}{x^2}}}{b^3x^2\log^3(f)} + \frac{3f^{a+\frac{b}{x^2}}}{2b^2x^4\log^2(f)} - \frac{f^{a+\frac{b}{x^2}}}{2bx^6\log(f)} - \frac{6\int \frac{f^{a+\frac{b}{x^2}}}{x^3}\,dx}{b^3\log^3(f)} \\
&= \frac{3f^{a+\frac{b}{x^2}}}{b^4\log^4(f)} - \frac{3f^{a+\frac{b}{x^2}}}{b^3x^2\log^3(f)} + \frac{3f^{a+\frac{b}{x^2}}}{2b^2x^4\log^2(f)} - \frac{f^{a+\frac{b}{x^2}}}{2bx^6\log(f)}
\end{aligned}
$$

Mathematica [A] time = 0.01, size = 58, normalized size = 0.67

$$
\frac{f^{a+\frac{b}{x^2}}\left(-b^3\log^3(f)+3b^2x^2\log^2(f)-6bx^4\log(f)+6x^6\right)}{2b^4x^6\log^4(f)}
$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^2)/x^9,x]
```

```
[Out] (f^(a + b/x^2)*(6*x^6 - 6*b*x^4*Log[f] + 3*b^2*x^2*Log[f]^2 - b^3*Log[f]^3)
)/(2*b^4*x^6*Log[f]^4)
```

fricas [A] time = 0.40, size = 60, normalized size = 0.70

$$
\frac{\left(6\,x^6-6\,bx^4\log(f)+3\,b^2x^2\log(f)^2-b^3\log(f)^3\right)f^{\frac{ax^2+b}{x^2}}}{2\,b^4x^6\log(f)^4}
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^9,x, algorithm="fricas")
```

```
[Out] 1/2*(6*x^6 - 6*b*x^4*log(f) + 3*b^2*x^2*log(f)^2 - b^3*log(f)^3)*f^((a*x^2
+ b)/x^2)/(b^4*x^6*log(f)^4)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$
\int \frac{f^{a+\frac{b}{x^2}}}{x^9}\,dx
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^9,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^2)/x^9, x)
```

maple [A] time = 0.03, size = 98, normalized size = 1.14

$$\frac{-\frac{x^{2} {\mathrm e}^{\left(a +\frac{b}{x^{2}}\right) \ln \left(f \right)}}{2 b \ln \left(f \right)}+\frac{3 x^{4} {\mathrm e}^{\left(a +\frac{b}{x^{2}}\right) \ln \left(f \right)}}{2 b^{2} \ln \left(f \right)^{2}}-\frac{3 x^{6} {\mathrm e}^{\left(a +\frac{b}{x^{2}}\right) \ln \left(f \right)}}{b^{3} \ln \left(f \right)^{3}}+\frac{3 x^{8} {\mathrm e}^{\left(a +\frac{b}{x^{2}}\right) \ln \left(f \right)}}{b^{4} \ln \left(f \right)^{4}}}{x^{8}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2)/x^9,x)
```

```
[Out] (3/b^4/ln(f)^4*x^8*exp((a+b/x^2)*ln(f))-3/b^3*x^6*exp((a+b/x^2)*ln(f))/ln(f
)^3+3/2/b^2*x^4*exp((a+b/x^2)*ln(f))/ln(f)^2-1/2/b*x^2*exp((a+b/x^2)*ln(f))
/ln(f))/x^8
```

maxima [C] time = 1.28, size = 22, normalized size = 0.26

$$\frac{f^{a} \Gamma\left(4, -\frac{b \log\left(f\right)}{x^{2}}\right)}{2 \, b^{4} \log\left(f\right)^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^9,x, algorithm="maxima")
```

```
[Out] 1/2*f^a*gamma(4, -b*log(f)/x^2)/(b^4*log(f)^4)
```

mupad [B] time = 3.63, size = 60, normalized size = 0.70

$$-\frac{f^{a+\frac{b}{x^2}}\,\left(\frac{1}{2\,b\,\ln\left(f\right)}-\frac{3\,x^2}{2\,b^2\,{\ln\left(f\right)}^2}+\frac{3\,x^4}{b^3\,{\ln\left(f\right)}^3}-\frac{3\,x^6}{b^4\,{\ln\left(f\right)}^4}\right)}{x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)/x^9,x)
```

```
[Out] -(f^(a + b/x^2)*(1/(2*b*log(f)) - (3*x^2)/(2*b^2*log(f)^2) + (3*x^4)/(b^3*l
og(f)^3) - (3*x^6)/(b^4*log(f)^4)))/x^6
```

sympy [A] time = 0.15, size = 58, normalized size = 0.67

$$\frac{f^{a + \frac{b}{x^{2}}} \left(- b^{3} \log{\left(f \right)}^{3} + 3 b^{2} x^{2} \log{\left(f \right)}^{2} - 6 b x^{4} \log{\left(f \right)} + 6 x^{6}\right)}{2 b^{4} x^{6} \log{\left(f \right)}^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)/x**9,x)
```

```
[Out] f**(a + b/x**2)*(-b**3*log(f)**3 + 3*b**2*x**2*log(f)**2 - 6*b*x**4*log(f)
+ 6*x**6)/(2*b**4*x**6*log(f)**4)
```

3.139 $\int \frac{f^{a+\frac{b}{x^2}}}{x^{11}}\,dx$

Optimal. Leaf size=69

$$-\frac{f^{a+\frac{b}{x^2}}\left(b^4\log^4(f)-4b^3x^2\log^3(f)+12b^2x^4\log^2(f)-24bx^6\log(f)+24x^8\right)}{2b^5x^8\log^5(f)}$$

```
[Out] -1/2*f^(a+b/x^2)*(24*x^8-24*b*x^6*ln(f)+12*b^2*x^4*ln(f)^2-4*b^3*x^2*ln(f)^
3+b^4*ln(f)^4)/b^5/x^8/ln(f)^5
```

Rubi [C] time = 0.02, antiderivative size = 24, normalized size of antiderivative = 0.35, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2218}

$$-\frac{f^a\text{Gamma}\left(5,-\frac{b\log(f)}{x^2}\right)}{2b^5\log^5(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2)/x^11,x]
```

```
[Out] -(f^a*Gamma[5, -((b*Log[f])/x^2)])/(2*b^5*Log[f]^5)
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x^2}}}{x^{11}}\,dx=-\frac{f^a\Gamma\left(5,-\frac{b\log(f)}{x^2}\right)}{2b^5\log^5(f)}$$

Mathematica [C] time = 0.00, size = 24, normalized size = 0.35

$$-\frac{f^a\Gamma\left(5,-\frac{b\log(f)}{x^2}\right)}{2b^5\log^5(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^2)/x^11,x]
```

```
[Out] -1/2*(f^a*Gamma[5, -((b*Log[f])/x^2)])/(b^5*Log[f]^5)
```

fricas [A] time = 0.43, size = 71, normalized size = 1.03

$$-\frac{\left(24\,x^{8}-24\,bx^{6}\log(f)+12\,b^{2}x^{4}\log(f)^{2}-4\,b^{3}x^{2}\log(f)^{3}+b^{4}\log(f)^{4}\right)f^{\frac{ax^{2}+b}{x^{2}}}}{2\,b^{5}x^{8}\log(f)^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^11,x, algorithm="fricas")
```

```
[Out] -1/2*(24*x^8 - 24*b*x^6*log(f) + 12*b^2*x^4*log(f)^2 - 4*b^3*x^2*log(f)^3 +
 b^4*log(f)^4)*f^((a*x^2 + b)/x^2)/(b^5*x^8*log(f)^5)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+\frac{b}{x^{2}}}}{x^{11}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^11,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^2)/x^11, x)
```

maple [A] time = 0.03, size = 121, normalized size = 1.75

$$\frac{-\frac{x^{2}e^{\left(a+\frac{b}{x^{2}}\right)\ln(f)}}{2b\ln(f)}+\frac{2x^{4}e^{\left(a+\frac{b}{x^{2}}\right)\ln(f)}}{b^{2}\ln(f)^{2}}-\frac{6x^{6}e^{\left(a+\frac{b}{x^{2}}\right)\ln(f)}}{b^{3}\ln(f)^{3}}+\frac{12x^{8}e^{\left(a+\frac{b}{x^{2}}\right)\ln(f)}}{b^{4}\ln(f)^{4}}-\frac{12x^{10}e^{\left(a+\frac{b}{x^{2}}\right)\ln(f)}}{b^{5}\ln(f)^{5}}}{x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2)/x^11,x)
```

```
[Out] (-12/b^5/ln(f)^5*x^10*exp((a+b/x^2)*ln(f))+12/b^4*x^8*exp((a+b/x^2)*ln(f))/
ln(f)^4-6/b^3*x^6*exp((a+b/x^2)*ln(f))/ln(f)^3+2/b^2*x^4*exp((a+b/x^2)*ln(f
))/ln(f)^2-1/2/b*x^2*exp((a+b/x^2)*ln(f))/ln(f))/x^10
```

maxima [C] time = 1.27, size = 22, normalized size = 0.32

$$-\frac{f^{a}\Gamma\left(5,-\frac{b\log(f)}{x^{2}}\right)}{2\,b^{5}\log(f)^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^11,x, algorithm="maxima")
```

```
[Out] -1/2*f^a*gamma(5, -b*log(f)/x^2)/(b^5*log(f)^5)
```

mupad [B] time = 3.60, size = 72, normalized size = 1.04

$$-\frac{f^{a+\frac{b}{x^2}}\left(\frac{1}{2\,b\,\ln(f)}-\frac{2\,x^2}{b^2\ln(f)^2}+\frac{6\,x^4}{b^3\ln(f)^3}-\frac{12\,x^6}{b^4\ln(f)^4}+\frac{12\,x^8}{b^5\ln(f)^5}\right)}{x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)/x^11,x)
```

```
[Out] -(f^(a + b/x^2)*(1/(2*b*log(f)) - (2*x^2)/(b^2*log(f)^2) + (6*x^4)/(b^3*log
(f)^3) - (12*x^6)/(b^4*log(f)^4) + (12*x^8)/(b^5*log(f)^5)))/x^8
```

sympy [A] time = 0.16, size = 71, normalized size = 1.03

$$\frac{f^{a+\frac{b}{x^2}}\left(-b^4\log(f)^4+4b^3x^2\log(f)^3-12b^2x^4\log(f)^2+24bx^6\log(f)-24x^8\right)}{2b^5x^8\log(f)^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)/x**11,x)
```

```
[Out] f**(a + b/x**2)*(-b**4*log(f)**4 + 4*b**3*x**2*log(f)**3 - 12*b**2*x**4*log
(f)**2 + 24*b*x**6*log(f) - 24*x**8)/(2*b**5*x**8*log(f)**5)
```

3.140 $\int \frac{f^{a+\frac{b}{x^2}}}{x^{13}} \, dx$

Optimal. Leaf size=82

$$\frac{f^{a+\frac{b}{x^2}} \left(-b^5 \log^5(f)+5 b^4 x^2 \log^4(f)-20 b^3 x^4 \log^3(f)+60 b^2 x^6 \log^2(f)-120 b x^8 \log(f)+120 x^{10}\right)}{2 b^6 x^{10} \log^6(f)}$$

```
[Out] 1/2*f^(a+b/x^2)*(120*x^10-120*b*x^8*ln(f)+60*b^2*x^6*ln(f)^2-20*b^3*x^4*ln(
f)^3+5*b^4*x^2*ln(f)^4-b^5*ln(f)^5)/b^6/x^10/ln(f)^6
```

Rubi [C] time = 0.02, antiderivative size = 24, normalized size of antiderivative = 0.29, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2218}

$$\frac{f^a \text{Gamma}\left(6,-\frac{b \log(f)}{x^2}\right)}{2 b^6 \log^6(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2)/x^13,x]
```

```
[Out] (f^a*Gamma[6, -((b*Log[f])/x^2)])/(2*b^6*Log[f]^6)
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x^2}}}{x^{13}} \, dx = \frac{f^a \Gamma\left(6,-\frac{b \log(f)}{x^2}\right)}{2 b^6 \log^6(f)}$$

Mathematica [C] time = 0.00, size = 24, normalized size = 0.29

$$\frac{f^a \Gamma\left(6,-\frac{b \log(f)}{x^2}\right)}{2 b^6 \log^6(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^2)/x^13,x]
```

```
[Out] (f^a*Gamma[6, -((b*Log[f])/x^2)])/(2*b^6*Log[f]^6)
```

fricas [A] time = 0.42, size = 84, normalized size = 1.02

$$\frac{\left(120\,x^{10}-120\,bx^{8}\log(f)+60\,b^{2}x^{6}\log(f)^{2}-20\,b^{3}x^{4}\log(f)^{3}+5\,b^{4}x^{2}\log(f)^{4}-b^{5}\log(f)^{5}\right)f^{\frac{ax^{2}+b}{x^{2}}}}{2\,b^{6}x^{10}\log(f)^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^13,x, algorithm="fricas")
```

```
[Out] 1/2*(120*x^10 - 120*b*x^8*log(f) + 60*b^2*x^6*log(f)^2 - 20*b^3*x^4*log(f)^
3 + 5*b^4*x^2*log(f)^4 - b^5*log(f)^5)*f^((a*x^2 + b)/x^2)/(b^6*x^10*log(f)
^6)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+\frac{b}{x^2}}}{x^{13}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^13,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^2)/x^13, x)
```

maple [A] time = 0.04, size = 144, normalized size = 1.76

$$\frac{-\frac{x^{2}{\rm e}^{\left(a+\frac{b}{x^{2}}\right)\ln(f)}}{2b\ln(f)}+\frac{5x^{4}{\rm e}^{\left(a+\frac{b}{x^{2}}\right)\ln(f)}}{2b^{2}\ln(f)^{2}}-\frac{10x^{6}{\rm e}^{\left(a+\frac{b}{x^{2}}\right)\ln(f)}}{b^{3}\ln(f)^{3}}+\frac{30x^{8}{\rm e}^{\left(a+\frac{b}{x^{2}}\right)\ln(f)}}{b^{4}\ln(f)^{4}}-\frac{60x^{10}{\rm e}^{\left(a+\frac{b}{x^{2}}\right)\ln(f)}}{b^{5}\ln(f)^{5}}+\frac{60x^{12}{\rm e}^{\left(a+\frac{b}{x^{2}}\right)\ln(f)}}{b^{6}\ln(f)^{6}}}{x^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2)/x^13,x)
```

```
[Out] (60/b^6/ln(f)^6*x^12*exp((a+b/x^2)*ln(f))-60/b^5*x^10*exp((a+b/x^2)*ln(f))/
ln(f)^5+30/b^4*x^8*exp((a+b/x^2)*ln(f))/ln(f)^4-10/b^3*x^6*exp((a+b/x^2)*ln
(f))/ln(f)^3+5/2/b^2*x^4*exp((a+b/x^2)*ln(f))/ln(f)^2-1/2/b*x^2*exp((a+b/x^
2)*ln(f))/ln(f))/x^12
```

maxima [C] time = 1.28, size = 22, normalized size = 0.27

$$\frac{f^{a}\Gamma\left(6,-\frac{b\log(f)}{x^{2}}\right)}{2\,b^{6}\log(f)^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^13,x, algorithm="maxima")
```

```
[Out] 1/2*f^a*gamma(6, -b*log(f)/x^2)/(b^6*log(f)^6)
```

mupad [B] time = 3.61, size = 84, normalized size = 1.02

$$-\frac{f^{a+\frac{b}{x^2}}\left(\frac{1}{2\,b\,\ln(f)}-\frac{5\,x^2}{2\,b^2\ln(f)^2}+\frac{10\,x^4}{b^3\ln(f)^3}-\frac{30\,x^6}{b^4\ln(f)^4}+\frac{60\,x^8}{b^5\ln(f)^5}-\frac{60\,x^{10}}{b^6\ln(f)^6}\right)}{x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)/x^13,x)
```

```
[Out] -(f^(a + b/x^2)*(1/(2*b*log(f)) - (5*x^2)/(2*b^2*log(f)^2) + (10*x^4)/(b^3*
log(f)^3) - (30*x^6)/(b^4*log(f)^4) + (60*x^8)/(b^5*log(f)^5) - (60*x^10)/(
b^6*log(f)^6)))/x^10
```

sympy [A] time = 0.18, size = 85, normalized size = 1.04

$$\frac{f^{a+\frac{b}{x^2}}\left(-b^5\log{(f)}^5+5b^4x^2\log{(f)}^4-20b^3x^4\log{(f)}^3+60b^2x^6\log{(f)}^2-120bx^8\log{(f)}+120x^{10}\right)}{2b^6x^{10}\log{(f)}^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)/x**13,x)
```

```
[Out] f**(a + b/x**2)*(-b**5*log(f)**5 + 5*b**4*x**2*log(f)**4 - 20*b**3*x**4*log
(f)**3 + 60*b**2*x**6*log(f)**2 - 120*b*x**8*log(f) + 120*x**10)/(2*b**6*x*
*10*log(f)**6)
```

3.141 $\int f^{a+\frac{b}{x^2}} x^{10}\, dx$

Optimal. Leaf size=34

$$\frac{1}{2} x^{11} f^a \left(-\frac{b \log(f)}{x^2}\right)^{11/2} \Gamma\left(-\frac{11}{2}, -\frac{b \log(f)}{x^2}\right)$$

```
[Out] 1/2*f^a*x^11*(64/10395*Pi^(1/2)*erfc((-b*ln(f)/x^2)^(1/2))-64/10395/(-b*ln(
f)/x^2)^(1/2)*exp(b*ln(f)/x^2)+32/10395/(-b*ln(f)/x^2)^(3/2)*exp(b*ln(f)/x^
2)-16/3465/(-b*ln(f)/x^2)^(5/2)*exp(b*ln(f)/x^2)+8/693/(-b*ln(f)/x^2)^(7/2)
*exp(b*ln(f)/x^2)-4/99/(-b*ln(f)/x^2)^(9/2)*exp(b*ln(f)/x^2)+2/11/(-b*ln(f)
/x^2)^(11/2)*exp(b*ln(f)/x^2))*(-b*ln(f)/x^2)^(11/2)
```

Rubi [A] time = 0.02, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2218}

$$\frac{1}{2} x^{11} f^a \left(-\frac{b \log(f)}{x^2}\right)^{11/2} \text{Gamma}\left(-\frac{11}{2}, -\frac{b \log(f)}{x^2}\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2)*x^10,x]
```

```
[Out] (f^a*x^11*Gamma[-11/2, -((b*Log[f])/x^2)]*(-((b*Log[f])/x^2))^(11/2))/2
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+\frac{b}{x^2}} x^{10}\, dx = \frac{1}{2} f^a x^{11} \Gamma\left(-\frac{11}{2}, -\frac{b \log(f)}{x^2}\right) \left(-\frac{b \log(f)}{x^2}\right)^{11/2}$$

Mathematica [A] time = 0.00, size = 34, normalized size = 1.00

$$\frac{1}{2} x^{11} f^a \left(-\frac{b \log(f)}{x^2}\right)^{11/2} \Gamma\left(-\frac{11}{2}, -\frac{b \log(f)}{x^2}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^2)*x^10,x]
```

```
[Out] (f^a*x^11*Gamma[-11/2, -((b*Log[f])/x^2)]*(-((b*Log[f])/x^2))^(11/2))/2
```

fricas [A] time = 0.42, size = 110, normalized size = 3.24

$$\frac{32}{10395}\sqrt{\pi}\sqrt{-b\log(f)}\,b^5 f^a \operatorname{erf}\left(\frac{\sqrt{-b\log(f)}}{x}\right)\log(f)^5+\frac{1}{10395}\left(945\,x^{11}+210\,bx^9\log(f)+60\,b^2x^7\log(f)^2+24\,b\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^10,x, algorithm="fricas")
```

```
[Out] 32/10395*sqrt(pi)*sqrt(-b*log(f))*b^5*f^a*erf(sqrt(-b*log(f))/x)*log(f)^5 +
 1/10395*(945*x^11 + 210*b*x^9*log(f) + 60*b^2*x^7*log(f)^2 + 24*b^3*x^5*lo
g(f)^3 + 16*b^4*x^3*log(f)^4 + 32*b^5*x*log(f)^5)*f^((a*x^2 + b)/x^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x^2}}x^{10}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^10,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^2)*x^10, x)
```

maple [A] time = 0.13, size = 155, normalized size = 4.56

$$-\frac{32\sqrt{\pi}\,b^6 f^a \operatorname{erf}\left(\frac{\sqrt{-b\ln(f)}}{x}\right)\ln(f)^6}{10395\sqrt{-b\ln(f)}}+\frac{32b^5x\,f^a f^{\frac{b}{x^2}}\ln(f)^5}{10395}+\frac{16b^4x^3f^af^{\frac{b}{x^2}}\ln(f)^4}{10395}+\frac{8b^3x^5f^af^{\frac{b}{x^2}}\ln(f)^3}{3465}+\frac{4b^2x^7f^af^{\frac{b}{x^2}}\ln}{693}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2)*x^10,x)
```

```
[Out] 1/11*f^a*x^11*f^(b/x^2)+2/99*f^a*ln(f)*b*x^9*f^(b/x^2)+4/693*f^a*ln(f)^2*b^
2*x^7*f^(b/x^2)+8/3465*f^a*ln(f)^3*b^3*x^5*f^(b/x^2)+16/10395*f^a*ln(f)^4*b
^4*x^3*f^(b/x^2)+32/10395*f^a*ln(f)^5*b^5*x*f^(b/x^2)-32/10395*f^a*ln(f)^6*
b^6*Pi^(1/2)/(-b*ln(f))^(1/2)*erf((-b*ln(f))^(1/2)/x)
```

maxima [A] time = 1.22, size = 28, normalized size = 0.82

$$\frac{1}{2}f^ax^{11}\left(-\frac{b\log(f)}{x^2}\right)^{\frac{11}{2}}\Gamma\left(-\frac{11}{2},-\frac{b\log(f)}{x^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^10,x, algorithm="maxima")
```

```
[Out] 1/2*f^a*x^11*(-b*log(f)/x^2)^(11/2)*gamma(-11/2, -b*log(f)/x^2)
```

mupad [B] time = 3.66, size = 173, normalized size = 5.09

$$\frac{f^a\, f^{\frac{b}{x^2}}\, x^{11}}{11}-\frac{32\, f^a\, x^{11}\, \sqrt{\pi}\, \left(-\frac{b\, \ln(f)}{x^2}\right)^{11/2}}{10395}+\frac{32\, f^a\, x^{11}\, \sqrt{\pi}\, \mathrm{erfc}\left(\sqrt{-\frac{b\, \ln(f)}{x^2}}\right)\, \left(-\frac{b\, \ln(f)}{x^2}\right)^{11/2}}{10395}+\frac{32\, b^5\, f^a\, f^{\frac{b}{x^2}}\, x\, \ln(f)^5}{10395}+\frac{4\, l}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)*x^10,x)
```

```
[Out] (f^a*f^(b/x^2)*x^11)/11 - (32*f^a*x^11*pi^(1/2)*(-(b*log(f))/x^2)^(11/2))/1
0395 + (32*f^a*x^11*pi^(1/2)*erfc((-(b*log(f))/x^2)^(1/2))*(-(b*log(f))/x^2
)^(11/2))/10395 + (32*b^5*f^a*f^(b/x^2)*x*log(f)^5)/10395 + (4*b^2*f^a*f^(b
/x^2)*x^7*log(f)^2)/693 + (8*b^3*f^a*f^(b/x^2)*x^5*log(f)^3)/3465 + (16*b^4
*f^a*f^(b/x^2)*x^3*log(f)^4)/10395 + (2*b*f^a*f^(b/x^2)*x^9*log(f))/99
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x^2}}x^{10}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)*x**10,x)
```

```
[Out] Integral(f**(a + b/x**2)*x**10, x)
```

3.142 $\int f^{a+\frac{b}{x^2}} x^8 \, dx$

Optimal. Leaf size=34

$$\frac{1}{2}x^9 f^a \left(-\frac{b\log(f)}{x^2}\right)^{9/2} \Gamma\left(-\frac{9}{2},-\frac{b\log(f)}{x^2}\right)$$

```
[Out] 1/2*f^a*x^9*(-32/945*Pi^(1/2)*erfc((-b*ln(f)/x^2)^(1/2))+32/945/(-b*ln(f)/x
^2)^(1/2)*exp(b*ln(f)/x^2)-16/945/(-b*ln(f)/x^2)^(3/2)*exp(b*ln(f)/x^2)+8/3
15/(-b*ln(f)/x^2)^(5/2)*exp(b*ln(f)/x^2)-4/63/(-b*ln(f)/x^2)^(7/2)*exp(b*ln
(f)/x^2)+2/9/(-b*ln(f)/x^2)^(9/2)*exp(b*ln(f)/x^2))*(-b*ln(f)/x^2)^(9/2)
```

Rubi [A] time = 0.02, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2218}

$$\frac{1}{2}x^9 f^a \left(-\frac{b\log(f)}{x^2}\right)^{9/2} \text{Gamma}\left(-\frac{9}{2},-\frac{b\log(f)}{x^2}\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2)*x^8,x]
```

```
[Out] (f^a*x^9*Gamma[-9/2, -((b*Log[f])/x^2)]*(-((b*Log[f])/x^2))^(9/2))/2
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+\frac{b}{x^2}} x^8 \, dx = \frac{1}{2} f^a x^9 \Gamma\left(-\frac{9}{2},-\frac{b\log(f)}{x^2}\right)\left(-\frac{b\log(f)}{x^2}\right)^{9/2}$$

Mathematica [A] time = 0.00, size = 34, normalized size = 1.00

$$\frac{1}{2}x^9 f^a \left(-\frac{b\log(f)}{x^2}\right)^{9/2} \Gamma\left(-\frac{9}{2},-\frac{b\log(f)}{x^2}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^2)*x^8,x]
[Out] (f^a*x^9*Gamma[-9/2, -((b*Log[f])/x^2)]*(-((b*Log[f])/x^2))^(9/2))/2
```

fricas [A] time = 0.42, size = 98, normalized size = 2.88

$$\frac{16}{945}\sqrt{\pi}\sqrt{-b\log(f)}\,b^4f^a\operatorname{erf}\left(\frac{\sqrt{-b\log(f)}}{x}\right)\log(f)^4+\frac{1}{945}\left(105\,x^9+30\,bx^7\log(f)+12\,b^2x^5\log(f)^2+8\,b^3x^3\log\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^8,x, algorithm="fricas")
[Out] 16/945*sqrt(pi)*sqrt(-b*log(f))*b^4*f^a*erf(sqrt(-b*log(f))/x)*log(f)^4 + 1
/945*(105*x^9 + 30*b*x^7*log(f) + 12*b^2*x^5*log(f)^2 + 8*b^3*x^3*log(f)^3
+ 16*b^4*x*log(f)^4)*f^((a*x^2 + b)/x^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x^2}}x^8\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^8,x, algorithm="giac")
[Out] integrate(f^(a + b/x^2)*x^8, x)
```

maple [A] time = 0.08, size = 133, normalized size = 3.91

$$-\frac{16\sqrt{\pi}\,b^5f^a\operatorname{erf}\left(\frac{\sqrt{-b\ln(f)}}{x}\right)\ln(f)^5}{945\sqrt{-b\ln(f)}}+\frac{16b^4x\,f^af^{\frac{b}{x^2}}\ln(f)^4}{945}+\frac{8b^3x^3f^af^{\frac{b}{x^2}}\ln(f)^3}{945}+\frac{4b^2x^5f^af^{\frac{b}{x^2}}\ln(f)^2}{315}+\frac{2b\,x^7f^af^{\frac{b}{x^2}}\ln}{63}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2)*x^8,x)
[Out] 1/9*f^a*x^9*f^(b/x^2)+2/63*f^a*ln(f)*b*x^7*f^(b/x^2)+4/315*f^a*ln(f)^2*b^2*
x^5*f^(b/x^2)+8/945*f^a*ln(f)^3*b^3*x^3*f^(b/x^2)+16/945*f^a*ln(f)^4*b^4*x*
f^(b/x^2)-16/945*f^a*ln(f)^5*b^5*Pi^(1/2)/(-b*ln(f))^(1/2)*erf((-b*ln(f))^(
1/2)/x)
```

maxima [A] time = 1.34, size = 28, normalized size = 0.82

$$\frac{1}{2}\,f^ax^9\left(-\frac{b\log(f)}{x^2}\right)^{\frac{9}{2}}\Gamma\left(-\frac{9}{2},-\frac{b\log(f)}{x^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^8,x, algorithm="maxima")
```

```
[Out] 1/2*f^a*x^9*(-b*log(f)/x^2)^(9/2)*gamma(-9/2, -b*log(f)/x^2)
```

mupad [B] time = 3.66, size = 151, normalized size = 4.44

$$\frac{f^a f^{\frac{b}{x^2}} x^9}{9}+\frac{16 f^a x^9 \sqrt{\pi} \left(-\frac{b \ln(f)}{x^2}\right)^{9/2}}{945}-\frac{16 f^a x^9 \sqrt{\pi} \operatorname{erfc}\left(\sqrt{-\frac{b \ln(f)}{x^2}}\right) \left(-\frac{b \ln(f)}{x^2}\right)^{9/2}}{945}+\frac{16 b^4 f^a f^{\frac{b}{x^2}} x \ln(f)^4}{945}+\frac{4 b^2 f^a f}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)*x^8,x)
```

```
[Out] (f^a*f^(b/x^2)*x^9)/9 + (16*f^a*x^9*pi^(1/2)*(-(b*log(f))/x^2)^(9/2))/945 -
 (16*f^a*x^9*pi^(1/2)*erfc((-(b*log(f))/x^2)^(1/2))*(-(b*log(f))/x^2)^(9/2)
)/945 + (16*b^4*f^a*f^(b/x^2)*x*log(f)^4)/945 + (4*b^2*f^a*f^(b/x^2)*x^5*lo
g(f)^2)/315 + (8*b^3*f^a*f^(b/x^2)*x^3*log(f)^3)/945 + (2*b*f^a*f^(b/x^2)*x
^7*log(f))/63
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x^2}} x^8 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)*x**8,x)
```

```
[Out] Integral(f**(a + b/x**2)*x**8, x)
```

3.143 $\int f^{a+\frac{b}{x^2}} x^6 \, dx$

Optimal. Leaf size=119

$$-\frac{8}{105}\sqrt{\pi}\, b^{7/2} f^a \log^{\frac{7}{2}}(f)\text{erfi}\left(\frac{\sqrt{b}\sqrt{\log(f)}}{x}\right)+\frac{8}{105}b^3 x \log^3(f) f^{a+\frac{b}{x^2}}+\frac{4}{105}b^2 x^3 \log^2(f) f^{a+\frac{b}{x^2}}+\frac{1}{7}x^7 f^{a+\frac{b}{x^2}}+\frac{2}{35}b x^5 \text{lo}$$

```
[Out] 1/7*f^(a+b/x^2)*x^7+2/35*b*f^(a+b/x^2)*x^5*ln(f)+4/105*b^2*f^(a+b/x^2)*x^3*
ln(f)^2+8/105*b^3*f^(a+b/x^2)*x*ln(f)^3-8/105*b^(7/2)*f^a*erfi(b^(1/2)*ln(f
)^(1/2)/x)*ln(f)^(7/2)*Pi^(1/2)
```

Rubi [A] time = 0.13, antiderivative size = 119, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308, Rules used = {2214, 2206, 2211, 2204}

$$-\frac{8}{105}\sqrt{\pi}\, b^{7/2} f^a \log^{\frac{7}{2}}(f)\text{Erfi}\left(\frac{\sqrt{b}\sqrt{\log(f)}}{x}\right)+\frac{8}{105}b^3 x \log^3(f) f^{a+\frac{b}{x^2}}+\frac{4}{105}b^2 x^3 \log^2(f) f^{a+\frac{b}{x^2}}+\frac{1}{7}x^7 f^{a+\frac{b}{x^2}}+\frac{2}{35}b x^5 \text{lo}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2)*x^6,x]
```

```
[Out] (f^(a + b/x^2)*x^7)/7 + (2*b*f^(a + b/x^2)*x^5*Log[f])/35 + (4*b^2*f^(a + b
/x^2)*x^3*Log[f]^2)/105 + (8*b^3*f^(a + b/x^2)*x*Log[f]^3)/105 - (8*b^(7/2)
*f^a*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[f]])/x]*Log[f]^(7/2))/105
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2206

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[((c +
 d*x)*F^(a + b*(c + d*x)^n))/d, x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2211

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
```

```
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\begin{aligned}
\int f^{a+\frac{b}{x^2}} x^6\,dx &= \frac{1}{7} f^{a+\frac{b}{x^2}} x^7 + \frac{1}{7}(2b\log(f)) \int f^{a+\frac{b}{x^2}} x^4\,dx \\
&= \frac{1}{7} f^{a+\frac{b}{x^2}} x^7 + \frac{2}{35} b f^{a+\frac{b}{x^2}} x^5 \log(f) + \frac{1}{35}\left(4b^2\log^2(f)\right) \int f^{a+\frac{b}{x^2}} x^2\,dx \\
&= \frac{1}{7} f^{a+\frac{b}{x^2}} x^7 + \frac{2}{35} b f^{a+\frac{b}{x^2}} x^5 \log(f) + \frac{4}{105} b^2 f^{a+\frac{b}{x^2}} x^3 \log^2(f) + \frac{1}{105}\left(8b^3\log^3(f)\right) \int f^{a+\frac{b}{x^2}}\,dx \\
&= \frac{1}{7} f^{a+\frac{b}{x^2}} x^7 + \frac{2}{35} b f^{a+\frac{b}{x^2}} x^5 \log(f) + \frac{4}{105} b^2 f^{a+\frac{b}{x^2}} x^3 \log^2(f) + \frac{8}{105} b^3 f^{a+\frac{b}{x^2}} x \log^3(f) + \frac{1}{105}\left(16b^4 \log \right. \\
&= \frac{1}{7} f^{a+\frac{b}{x^2}} x^7 + \frac{2}{35} b f^{a+\frac{b}{x^2}} x^5 \log(f) + \frac{4}{105} b^2 f^{a+\frac{b}{x^2}} x^3 \log^2(f) + \frac{8}{105} b^3 f^{a+\frac{b}{x^2}} x \log^3(f) - \frac{1}{105}\left(16b^4 \log \right. \\
&= \frac{1}{7} f^{a+\frac{b}{x^2}} x^7 + \frac{2}{35} b f^{a+\frac{b}{x^2}} x^5 \log(f) + \frac{4}{105} b^2 f^{a+\frac{b}{x^2}} x^3 \log^2(f) + \frac{8}{105} b^3 f^{a+\frac{b}{x^2}} x \log^3(f) - \frac{8}{105} b^{7/2} f^a \sqrt{\pi}
\end{aligned}$$

Mathematica [A] time = 0.04, size = 86, normalized size = 0.72

$$\frac{1}{105} f^a \left(x f^{\frac{b}{x^2}} \left(8b^3\log^3(f) + 4b^2x^2\log^2(f) + 6bx^4\log(f) + 15x^6\right) - 8\sqrt{\pi}\, b^{7/2} \log^{\frac{7}{2}}(f) \operatorname{erfi}\left(\frac{\sqrt{b}\sqrt{\log(f)}}{x}\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^2)*x^6,x]
```

```
[Out] (f^a*(-8*b^(7/2)*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[f]])/x]*Log[f]^(7/2) + f^(
b/x^2)*x*(15*x^6 + 6*b*x^4*Log[f] + 4*b^2*x^2*Log[f]^2 + 8*b^3*Log[f]^3)))/
105
```

fricas [A] time = 0.42, size = 86, normalized size = 0.72

$$\frac{8}{105}\sqrt{\pi}\sqrt{-b\log(f)}\,b^3f^a\operatorname{erf}\left(\frac{\sqrt{-b\log(f)}}{x}\right)\log(f)^3+\frac{1}{105}\left(15\,x^7+6\,bx^5\log(f)+4\,b^2x^3\log(f)^2+8\,b^3x\log(f)^3\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^6,x, algorithm="fricas")
```

```
[Out] 8/105*sqrt(pi)*sqrt(-b*log(f))*b^3*f^a*erf(sqrt(-b*log(f))/x)*log(f)^3 + 1/
105*(15*x^7 + 6*b*x^5*log(f) + 4*b^2*x^3*log(f)^2 + 8*b^3*x*log(f)^3)*f^((a
*x^2 + b)/x^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x^2}}x^6\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^6,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^2)*x^6, x)
```

maple [A] time = 0.07, size = 111, normalized size = 0.93

$$-\frac{8\sqrt{\pi}\,b^4f^a\operatorname{erf}\left(\frac{\sqrt{-b\ln(f)}}{x}\right)\ln(f)^4}{105\sqrt{-b\ln(f)}}+\frac{8b^3x\,f^af^{\frac{b}{x^2}}\ln(f)^3}{105}+\frac{4b^2x^3f^af^{\frac{b}{x^2}}\ln(f)^2}{105}+\frac{2b\,x^5f^af^{\frac{b}{x^2}}\ln(f)}{35}+\frac{x^7f^af^{\frac{b}{x^2}}}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2)*x^6,x)
```

```
[Out] 1/7*f^a*x^7*f^(b/x^2)+2/35*f^a*ln(f)*b*x^5*f^(b/x^2)+4/105*f^a*ln(f)^2*b^2*
x^3*f^(b/x^2)+8/105*f^a*ln(f)^3*b^3*x*f^(b/x^2)-8/105*f^a*ln(f)^4*b^4*Pi^(1
/2)/(-b*ln(f))^(1/2)*erf((-b*ln(f))^(1/2)/x)
```

maxima [A] time = 1.31, size = 28, normalized size = 0.24

$$\frac{1}{2}f^ax^7\left(-\frac{b\log(f)}{x^2}\right)^{\frac{7}{2}}\Gamma\left(-\frac{7}{2},-\frac{b\log(f)}{x^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^6,x, algorithm="maxima")
```

```
[Out] 1/2*f^a*x^7*(-b*log(f)/x^2)^(7/2)*gamma(-7/2, -b*log(f)/x^2)
```

mupad [B] time = 3.66, size = 129, normalized size = 1.08

$$\frac{f^a\,f^{\frac{b}{x^2}}\,x^7}{7}-\frac{8\,f^a\,x^7\,\sqrt{\pi}\,{\left(-\frac{b\,\ln(f)}{x^2}\right)}^{7/2}}{105}+\frac{8\,f^a\,x^7\,\sqrt{\pi}\,\mathrm{erfc}\left(\sqrt{-\frac{b\,\ln(f)}{x^2}}\right)\,{\left(-\frac{b\,\ln(f)}{x^2}\right)}^{7/2}}{105}+\frac{8\,b^3\,f^a\,f^{\frac{b}{x^2}}\,x\,{\ln(f)}^3}{105}+\frac{4\,b^2\,f^a\,f^{\frac{b}{x^2}}\,x}{105}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)*x^6,x)
```

```
[Out] (f^a*f^(b/x^2)*x^7)/7 - (8*f^a*x^7*pi^(1/2)*(-(b*log(f))/x^2)^(7/2))/105 +
(8*f^a*x^7*pi^(1/2)*erfc((-(b*log(f))/x^2)^(1/2))*(-(b*log(f))/x^2)^(7/2))/
105 + (8*b^3*f^a*f^(b/x^2)*x*log(f)^3)/105 + (4*b^2*f^a*f^(b/x^2)*x^3*log(f
)^2)/105 + (2*b*f^a*f^(b/x^2)*x^5*log(f))/35
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x^2}}x^6\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)*x**6,x)
```

```
[Out] Integral(f**(a + b/x**2)*x**6, x)
```

3.144 $\int f^{a+\frac{b}{x^2}} x^4 \, dx$

Optimal. Leaf size=96

$$-\frac{4}{15}\sqrt{\pi}\, b^{5/2} f^a \log^{\frac{5}{2}}(f) \text{erfi}\left(\frac{\sqrt{b}\sqrt{\log(f)}}{x}\right) + \frac{4}{15} b^2 x \log^2(f) f^{a+\frac{b}{x^2}} + \frac{1}{5} x^5 f^{a+\frac{b}{x^2}} + \frac{2}{15} b x^3 \log(f) f^{a+\frac{b}{x^2}}$$

```
[Out] 1/5*f^(a+b/x^2)*x^5+2/15*b*f^(a+b/x^2)*x^3*ln(f)+4/15*b^2*f^(a+b/x^2)*x*ln(
f)^2-4/15*b^(5/2)*f^a*erfi(b^(1/2)*ln(f)^(1/2)/x)*ln(f)^(5/2)*Pi^(1/2)
```

Rubi [A] time = 0.09, antiderivative size = 96, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308, Rules used = {2214, 2206, 2211, 2204}

$$-\frac{4}{15}\sqrt{\pi}\, b^{5/2} f^a \log^{\frac{5}{2}}(f) \text{Erfi}\left(\frac{\sqrt{b}\sqrt{\log(f)}}{x}\right) + \frac{4}{15} b^2 x \log^2(f) f^{a+\frac{b}{x^2}} + \frac{1}{5} x^5 f^{a+\frac{b}{x^2}} + \frac{2}{15} b x^3 \log(f) f^{a+\frac{b}{x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2)*x^4,x]
```

```
[Out] (f^(a + b/x^2)*x^5)/5 + (2*b*f^(a + b/x^2)*x^3*Log[f])/15 + (4*b^2*f^(a + b
/x^2)*x*Log[f]^2)/15 - (4*b^(5/2)*f^a*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[f]])/
x]*Log[f]^(5/2))/15
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2206

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[((c +
 d*x)*F^(a + b*(c + d*x)^n))/d, x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2211

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\begin{aligned}\int f^{a+\frac{b}{x^2}}x^4\,dx &= \frac{1}{5}f^{a+\frac{b}{x^2}}x^5+\frac{1}{5}(2b\log(f))\int f^{a+\frac{b}{x^2}}x^2\,dx\\ &= \frac{1}{5}f^{a+\frac{b}{x^2}}x^5+\frac{2}{15}bf^{a+\frac{b}{x^2}}x^3\log(f)+\frac{1}{15}\left(4b^2\log^2(f)\right)\int f^{a+\frac{b}{x^2}}\,dx\\ &= \frac{1}{5}f^{a+\frac{b}{x^2}}x^5+\frac{2}{15}bf^{a+\frac{b}{x^2}}x^3\log(f)+\frac{4}{15}b^2f^{a+\frac{b}{x^2}}x\log^2(f)+\frac{1}{15}\left(8b^3\log^3(f)\right)\int\frac{f^{a+\frac{b}{x^2}}}{x^2}\,dx\\ &= \frac{1}{5}f^{a+\frac{b}{x^2}}x^5+\frac{2}{15}bf^{a+\frac{b}{x^2}}x^3\log(f)+\frac{4}{15}b^2f^{a+\frac{b}{x^2}}x\log^2(f)-\frac{1}{15}\left(8b^3\log^3(f)\right)\text{Subst}\left(\int f^{a+bx^2}\,dx,x\right.\\ &= \frac{1}{5}f^{a+\frac{b}{x^2}}x^5+\frac{2}{15}bf^{a+\frac{b}{x^2}}x^3\log(f)+\frac{4}{15}b^2f^{a+\frac{b}{x^2}}x\log^2(f)-\frac{4}{15}b^{5/2}f^a\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{b}\sqrt{\log(f)}}{x}\right)\log^{\frac{5}{2}}(f\end{aligned}$$

Mathematica [A] time = 0.03, size = 74, normalized size = 0.77

$$\frac{1}{15}f^a\left(xf^{\frac{b}{x^2}}\left(4b^2\log^2(f)+2bx^2\log(f)+3x^4\right)-4\sqrt{\pi}\,b^{5/2}\log^{\frac{5}{2}}(f)\text{erfi}\left(\frac{\sqrt{b}\sqrt{\log(f)}}{x}\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^2)*x^4,x]
```

```
[Out] (f^a*(-4*b^(5/2)*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[f]])/x]*Log[f]^(5/2) + f^(
b/x^2)*x*(3*x^4 + 2*b*x^2*Log[f] + 4*b^2*Log[f]^2)))/15
```

fricas [A] time = 0.43, size = 74, normalized size = 0.77

$$\frac{4}{15}\sqrt{\pi}\sqrt{-b\log(f)}\,b^2f^a\,\text{erf}\left(\frac{\sqrt{-b\log(f)}}{x}\right)\log(f)^2+\frac{1}{15}\left(3\,x^5+2\,bx^3\log(f)+4\,b^2x\log(f)^2\right)f^{\frac{ax^2+b}{x^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^4,x, algorithm="fricas")
```

```
[Out] 4/15*sqrt(pi)*sqrt(-b*log(f))*b^2*f^a*erf(sqrt(-b*log(f))/x)*log(f)^2 + 1/1
5*(3*x^5 + 2*b*x^3*log(f) + 4*b^2*x*log(f)^2)*f^((a*x^2 + b)/x^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x^2}}x^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^4,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^2)*x^4, x)
```

maple [A] time = 0.06, size = 89, normalized size = 0.93

$$-\frac{4\sqrt{\pi}\,b^3f^a\operatorname{erf}\left(\frac{\sqrt{-b\ln(f)}}{x}\right)\ln(f)^3}{15\sqrt{-b\ln(f)}}+\frac{4b^2x\,f^a f^{\frac{b}{x^2}}\ln(f)^2}{15}+\frac{2b\,x^3f^a f^{\frac{b}{x^2}}\ln(f)}{15}+\frac{x^5f^a f^{\frac{b}{x^2}}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2)*x^4,x)
```

```
[Out] 1/5*f^a*x^5*f^(b/x^2)+2/15*f^a*ln(f)*b*x^3*f^(b/x^2)+4/15*f^a*ln(f)^2*b^2*x
*f^(b/x^2)-4/15*f^a*ln(f)^3*b^3*Pi^(1/2)/(-b*ln(f))^(1/2)*erf((-b*ln(f))^(1
/2)/x)
```

maxima [A] time = 1.24, size = 28, normalized size = 0.29

$$\frac{1}{2}f^ax^5\left(-\frac{b\log(f)}{x^2}\right)^{\frac{5}{2}}\Gamma\left(-\frac{5}{2},-\frac{b\log(f)}{x^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^4,x, algorithm="maxima")
```

```
[Out] 1/2*f^a*x^5*(-b*log(f)/x^2)^(5/2)*gamma(-5/2, -b*log(f)/x^2)
```

mupad [B] time = 3.61, size = 107, normalized size = 1.11

$$\frac{f^a\,f^{\frac{b}{x^2}}\,x^5}{5}+\frac{4\,f^a\,x^5\,\sqrt{\pi}\,\left(-\frac{b\,\ln(f)}{x^2}\right)^{5/2}}{15}-\frac{4\,f^a\,x^5\,\sqrt{\pi}\,\operatorname{erfc}\left(\sqrt{-\frac{b\,\ln(f)}{x^2}}\right)\,\left(-\frac{b\,\ln(f)}{x^2}\right)^{5/2}}{15}+\frac{4\,b^2\,f^a\,f^{\frac{b}{x^2}}\,x\ln(f)^2}{15}+\frac{2\,b\,f^a\,f^{\frac{b}{x^2}}}{15}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)*x^4,x)
```

```
[Out] (f^a*f^(b/x^2)*x^5)/5 + (4*f^a*x^5*pi^(1/2)*(-(b*log(f))/x^2)^(5/2))/15 - (
4*f^a*x^5*pi^(1/2)*erfc((-(b*log(f))/x^2)^(1/2))*(-(b*log(f))/x^2)^(5/2))/1
5 + (4*b^2*f^a*f^(b/x^2)*x*log(f)^2)/15 + (2*b*f^a*f^(b/x^2)*x^3*log(f))/15
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x^2}}x^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)*x**4,x)
```

```
[Out] Integral(f**(a + b/x**2)*x**4, x)
```

3.145 $\int f^{a+\frac{b}{x^2}} x^2\,dx$

Optimal. Leaf size=73

$$-\frac{2}{3}\sqrt{\pi}\,b^{3/2}f^a\log^{\frac{3}{2}}(f)\text{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(f)}}{x}\right)+\frac{2}{3}bx\log(f)f^{a+\frac{b}{x^2}}+\frac{1}{3}x^3f^{a+\frac{b}{x^2}}$$

```
[Out] 1/3*f^(a+b/x^2)*x^3+2/3*b*f^(a+b/x^2)*x*ln(f)-2/3*b^(3/2)*f^a*erfi(b^(1/2)*
ln(f)^(1/2)/x)*ln(f)^(3/2)*Pi^(1/2)
```

Rubi [A] time = 0.06, antiderivative size = 73, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308, Rules used = {2214, 2206, 2211, 2204}

$$-\frac{2}{3}\sqrt{\pi}\,b^{3/2}f^a\log^{\frac{3}{2}}(f)\text{Erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(f)}}{x}\right)+\frac{1}{3}x^3f^{a+\frac{b}{x^2}}+\frac{2}{3}bx\log(f)f^{a+\frac{b}{x^2}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2)*x^2,x]
```

```
[Out] (f^(a + b/x^2)*x^3)/3 + (2*b*f^(a + b/x^2)*x*Log[f])/3 - (2*b^(3/2)*f^a*Sqr
t[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[f]])/x]*Log[f]^(3/2))/3
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2206

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[((c +
 d*x)*F^(a + b*(c + d*x)^n))/d, x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2211

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\begin{aligned}\int f^{a+\frac{b}{x^2}}x^2\,dx &= \frac{1}{3}f^{a+\frac{b}{x^2}}x^3+\frac{1}{3}(2b\log(f))\int f^{a+\frac{b}{x^2}}\,dx\\ &= \frac{1}{3}f^{a+\frac{b}{x^2}}x^3+\frac{2}{3}bf^{a+\frac{b}{x^2}}x\log(f)+\frac{1}{3}\left(4b^2\log^2(f)\right)\int\frac{f^{a+\frac{b}{x^2}}}{x^2}\,dx\\ &= \frac{1}{3}f^{a+\frac{b}{x^2}}x^3+\frac{2}{3}bf^{a+\frac{b}{x^2}}x\log(f)-\frac{1}{3}\left(4b^2\log^2(f)\right)\mathrm{Subst}\left(\int f^{a+bx^2}\,dx,x,\frac{1}{x}\right)\\ &= \frac{1}{3}f^{a+\frac{b}{x^2}}x^3+\frac{2}{3}bf^{a+\frac{b}{x^2}}x\log(f)-\frac{2}{3}b^{3/2}f^a\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{b}\sqrt{\log(f)}}{x}\right)\log^{\frac{3}{2}}(f)\end{aligned}$$

Mathematica [A] time = 0.03, size = 60, normalized size = 0.82

$$\frac{1}{3}f^a\left(xf^{\frac{b}{x^2}}\left(2b\log(f)+x^2\right)-2\sqrt{\pi}\,b^{3/2}\log^{\frac{3}{2}}(f)\mathrm{erfi}\left(\frac{\sqrt{b}\sqrt{\log(f)}}{x}\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^2)*x^2,x]
```

```
[Out] (f^a*(-2*b^(3/2)*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[f]])/x]*Log[f]^(3/2) + f^(
b/x^2)*x*(x^2 + 2*b*Log[f])))/3
```

fricas [A] time = 0.43, size = 56, normalized size = 0.77

$$\frac{2}{3}\sqrt{\pi}\sqrt{-b\log(f)}\,bf^a\,\mathrm{erf}\left(\frac{\sqrt{-b\log(f)}}{x}\right)\log(f)+\frac{1}{3}\left(x^3+2\,bx\log(f)\right)f^{\frac{ax^2+b}{x^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^2,x, algorithm="fricas")
```

```
[Out] 2/3*sqrt(pi)*sqrt(-b*log(f))*b*f^a*erf(sqrt(-b*log(f))/x)*log(f) + 1/3*(x^3
 + 2*b*x*log(f))*f^((a*x^2 + b)/x^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x^2}}x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^2,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^2)*x^2, x)
```

maple [A] time = 0.06, size = 67, normalized size = 0.92

$$-\frac{2\sqrt{\pi}\,b^2 f^a \operatorname{erf}\left(\frac{\sqrt{-b\ln(f)}}{x}\right)\ln(f)^2}{3\sqrt{-b\ln(f)}}+\frac{2bx\,f^a f^{\frac{b}{x^2}}\ln(f)}{3}+\frac{x^3 f^a f^{\frac{b}{x^2}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2)*x^2,x)
```

```
[Out] 1/3*f^a*x^3*f^(b/x^2)+2/3*f^a*ln(f)*b*x*f^(b/x^2)-2/3*f^a*ln(f)^2*b^2*Pi^(1
/2)/(-b*ln(f))^(1/2)*erf((-b*ln(f))^(1/2)/x)
```

maxima [A] time = 1.27, size = 28, normalized size = 0.38

$$\frac{1}{2}\,f^a x^3\left(-\frac{b\log(f)}{x^2}\right)^{\frac{3}{2}}\Gamma\left(-\frac{3}{2},-\frac{b\log(f)}{x^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)*x^2,x, algorithm="maxima")
```

```
[Out] 1/2*f^a*x^3*(-b*log(f)/x^2)^(3/2)*gamma(-3/2, -b*log(f)/x^2)
```

mupad [B] time = 3.61, size = 71, normalized size = 0.97

$$x^3\left(\frac{f^a\,f^{\frac{b}{x^2}}}{3}+\frac{2\,b\,f^a\,f^{\frac{b}{x^2}}\,\ln(f)}{3\,x^2}\right)-\frac{2\,b^2\,f^a\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b\,\ln(f)}{x\,\sqrt{b\,\ln(f)}}\right)\,\ln(f)^2}{3\,\sqrt{b\,\ln(f)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)*x^2,x)
```

```
[Out] x^3*((f^a*f^(b/x^2))/3 + (2*b*f^a*f^(b/x^2)*log(f))/(3*x^2)) - (2*b^2*f^a*p
i^(1/2)*erfi((b*log(f))/(x*(b*log(f))^(1/2)))*log(f)^2)/(3*(b*log(f))^(1/2)
)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x^2}} x^2 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)*x**2,x)
```

```
[Out] Integral(f**(a + b/x**2)*x**2, x)
```

3.146 $\int f^{a+\frac{b}{x^2}}\,dx$

Optimal. Leaf size=49

$$xf^{a+\frac{b}{x^2}}-\sqrt{\pi}\sqrt{b}f^a\sqrt{\log(f)}\,\mathrm{erfi}\left(\frac{\sqrt{b}\sqrt{\log(f)}}{x}\right)$$

```
[Out] f^(a+b/x^2)*x-f^a*erfi(b^(1/2)*ln(f)^(1/2)/x)*b^(1/2)*Pi^(1/2)*ln(f)^(1/2)
```

Rubi [A] time = 0.03, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {2206, 2211, 2204}

$$xf^{a+\frac{b}{x^2}}-\sqrt{\pi}\sqrt{b}f^a\sqrt{\log(f)}\,\mathrm{Erfi}\left(\frac{\sqrt{b}\sqrt{\log(f)}}{x}\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2),x]
```

```
[Out] f^(a + b/x^2)*x - Sqrt[b]*f^a*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[f]])/x]*Sqrt[
Log[f]]
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2206

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[((c +
 d*x)*F^(a + b*(c + d*x)^n))/d, x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2211

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rubi steps

$$\begin{aligned}\int f^{a+\frac{b}{x^2}}\,dx &= f^{a+\frac{b}{x^2}}x + (2b\log(f))\int \frac{f^{a+\frac{b}{x^2}}}{x^2}\,dx\\ &= f^{a+\frac{b}{x^2}}x - (2b\log(f))\,\text{Subst}\left(\int f^{a+bx^2}\,dx, x, \frac{1}{x}\right)\\ &= f^{a+\frac{b}{x^2}}x - \sqrt{b}\,f^a\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{b}\sqrt{\log(f)}}{x}\right)\sqrt{\log(f)}\end{aligned}$$

Mathematica [**A**] time = 0.01, size = 49, normalized size = 1.00

$$xf^{a+\frac{b}{x^2}} - \sqrt{\pi}\sqrt{b}\,f^a\sqrt{\log(f)}\,\text{erfi}\left(\frac{\sqrt{b}\sqrt{\log(f)}}{x}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^2),x]
```

```
[Out] f^(a + b/x^2)*x - Sqrt[b]*f^a*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[f]])/x]*Sqrt[
Log[f]]
```

fricas [**A**] time = 0.41, size = 42, normalized size = 0.86

$$\sqrt{\pi}\sqrt{-b\log(f)}\,f^a\,\text{erf}\left(\frac{\sqrt{-b\log(f)}}{x}\right) + f^{\frac{ax^2+b}{x^2}}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2),x, algorithm="fricas")
```

```
[Out] sqrt(pi)*sqrt(-b*log(f))*f^a*erf(sqrt(-b*log(f))/x) + f^((a*x^2 + b)/x^2)*x
```

giac [**F**] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2),x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^2), x)
```

maple [A] time = 0.05, size = 44, normalized size = 0.90

$$-\frac{\sqrt{\pi}\, b\, f^{a} \operatorname{erf}\left(\frac{\sqrt{-b\ln(f)}}{x}\right)\ln(f)}{\sqrt{-b\ln(f)}}+x\, f^{a} f^{\frac{b}{x^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2),x)
```

```
[Out] f^a*x*f^(b/x^2)-f^a*ln(f)*b*Pi^(1/2)/(-b*ln(f))^(1/2)*erf((-b*ln(f))^(1/2)/
x)
```

maxima [A] time = 1.25, size = 26, normalized size = 0.53

$$\frac{1}{2}\, f^{a} x \sqrt{-\frac{b\log(f)}{x^2}}\, \Gamma\left(-\frac{1}{2}, -\frac{b\log(f)}{x^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2),x, algorithm="maxima")
```

```
[Out] 1/2*f^a*x*sqrt(-b*log(f)/x^2)*gamma(-1/2, -b*log(f)/x^2)
```

mupad [B] time = 3.60, size = 44, normalized size = 0.90

$$f^{a}\, f^{\frac{b}{x^2}}\, x-\frac{b\, f^{a} \sqrt{\pi}\, \operatorname{erfi}\left(\frac{b\, \ln(f)}{x\, \sqrt{b\, \ln(f)}}\right)\ln(f)}{\sqrt{b\, \ln(f)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2),x)
```

```
[Out] f^a*f^(b/x^2)*x - (b*f^a*pi^(1/2)*erfi((b*log(f))/(x*(b*log(f))^(1/2)))*log
(f))/(b*log(f))^(1/2)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x^2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2),x)
```

```
[Out] Integral(f**(a + b/x**2), x)
```

3.147 $\int \frac{f^{a+\frac{b}{x^2}}}{x^2} dx$

Optimal. Leaf size=39

$$-\frac{\sqrt{\pi} f^a \operatorname{erfi}\left(\frac{\sqrt{b}\sqrt{\log(f)}}{x}\right)}{2\sqrt{b}\sqrt{\log(f)}}$$

```
[Out] -1/2*f^a*erfi(b^(1/2)*ln(f)^(1/2)/x)*Pi^(1/2)/b^(1/2)/ln(f)^(1/2)
```

Rubi [A] time = 0.03, antiderivative size = 39, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2211, 2204}

$$-\frac{\sqrt{\pi} f^a \operatorname{Erfi}\left(\frac{\sqrt{b}\sqrt{\log(f)}}{x}\right)}{2\sqrt{b}\sqrt{\log(f)}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2)/x^2,x]
```

```
[Out] -(f^a*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[f]])/x])/(2*Sqrt[b]*Sqrt[Log[f]])
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2211

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x^2}}}{x^2}\,dx = -\operatorname{Subst}\left(\int f^{a+bx^2}\,dx, x, \frac{1}{x}\right)$$
$$= -\frac{f^a\sqrt{\pi}\operatorname{erfi}\left(\frac{\sqrt{b}\sqrt{\log(f)}}{x}\right)}{2\sqrt{b}\sqrt{\log(f)}}$$

Mathematica [A] time = 0.01, size = 39, normalized size = 1.00

$$-\frac{\sqrt{\pi}f^a\operatorname{erfi}\left(\frac{\sqrt{b}\sqrt{\log(f)}}{x}\right)}{2\sqrt{b}\sqrt{\log(f)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^2)/x^2,x]
[Out] -1/2*(f^a*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[f]])/x])/(Sqrt[b]*Sqrt[Log[f]])
```

fricas [A] time = 0.43, size = 34, normalized size = 0.87

$$\frac{\sqrt{\pi}\sqrt{-b\log(f)}f^a\operatorname{erf}\left(\frac{\sqrt{-b\log(f)}}{x}\right)}{2\,b\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^2,x, algorithm="fricas")
[Out] 1/2*sqrt(pi)*sqrt(-b*log(f))*f^a*erf(sqrt(-b*log(f))/x)/(b*log(f))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+\frac{b}{x^2}}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^2,x, algorithm="giac")
[Out] integrate(f^(a + b/x^2)/x^2, x)
```

maple [A] time = 0.05, size = 28, normalized size = 0.72

$$-\frac{\sqrt{\pi}\, f^{a} \operatorname{erf}\left(\frac{\sqrt{-b \ln(f)}}{x}\right)}{2\sqrt{-b \ln(f)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2)/x^2,x)
[Out] -1/2*f^a*Pi^(1/2)/(-b*ln(f))^(1/2)*erf((-b*ln(f))^(1/2)/x)
```

maxima [A] time = 1.30, size = 34, normalized size = 0.87

$$-\frac{\sqrt{\pi}\, f^{a}\left(\operatorname{erf}\left(\sqrt{-\frac{b \log(f)}{x^{2}}}\right)-1\right)}{2\, x \sqrt{-\frac{b \log(f)}{x^{2}}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^2,x, algorithm="maxima")
[Out] -1/2*sqrt(pi)*f^a*(erf(sqrt(-b*log(f)/x^2)) - 1)/(x*sqrt(-b*log(f)/x^2))
```

mupad [B] time = 3.52, size = 28, normalized size = 0.72

$$-\frac{f^{a}\, \sqrt{\pi}\, \operatorname{erfi}\left(\frac{b\, \ln(f)}{x\, \sqrt{b\, \ln(f)}}\right)}{2\, \sqrt{b\, \ln(f)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)/x^2,x)
[Out] -(f^a*pi^(1/2)*erfi((b*log(f))/(x*(b*log(f))^(1/2))))/(2*(b*log(f))^(1/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+\frac{b}{x^{2}}}}{x^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)/x**2,x)
[Out] Integral(f**(a + b/x**2)/x**2, x)
```

3.148 $\int \frac{f^{a+\frac{b}{x^2}}}{x^4} dx$

Optimal. Leaf size=63

$$\frac{\sqrt{\pi} f^a \text{erfi}\left(\frac{\sqrt{b}\sqrt{\log(f)}}{x}\right)}{4b^{3/2}\log^{\frac{3}{2}}(f)} - \frac{f^{a+\frac{b}{x^2}}}{2bx\log(f)}$$

```
[Out] -1/2*f^(a+b/x^2)/b/x/ln(f)+1/4*f^a*erfi(b^(1/2)*ln(f)^(1/2)/x)*Pi^(1/2)/b^(
3/2)/ln(f)^(3/2)
```

Rubi [A] time = 0.05, antiderivative size = 63, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231, Rules used = {2212, 2211, 2204}

$$\frac{\sqrt{\pi} f^a \text{Erfi}\left(\frac{\sqrt{b}\sqrt{\log(f)}}{x}\right)}{4b^{3/2}\log^{\frac{3}{2}}(f)} - \frac{f^{a+\frac{b}{x^2}}}{2bx\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2)/x^4,x]
```

```
[Out] (f^a*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[f]])/x])/(4*b^(3/2)*Log[f]^(3/2)) - f^
(a + b/x^2)/(2*b*x*Log[f])
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2211

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
```

```
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\begin{aligned}\int \frac{f^{a+\frac{b}{x^2}}}{x^4}\,dx &= -\frac{f^{a+\frac{b}{x^2}}}{2bx\log(f)}-\frac{\int \frac{f^{a+\frac{b}{x^2}}}{x^2}\,dx}{2b\log(f)}\\ &= -\frac{f^{a+\frac{b}{x^2}}}{2bx\log(f)}+\frac{\operatorname{Subst}\left(\int f^{a+bx^2}\,dx,x,\frac{1}{x}\right)}{2b\log(f)}\\ &= \frac{f^a\sqrt{\pi}\,\operatorname{erfi}\left(\frac{\sqrt{b}\sqrt{\log(f)}}{x}\right)}{4b^{3/2}\log^{\frac{3}{2}}(f)}-\frac{f^{a+\frac{b}{x^2}}}{2bx\log(f)}\end{aligned}$$

Mathematica [A] time = 0.02, size = 63, normalized size = 1.00

$$\frac{\sqrt{\pi}\,f^a\operatorname{erfi}\left(\frac{\sqrt{b}\sqrt{\log(f)}}{x}\right)}{4b^{3/2}\log^{\frac{3}{2}}(f)}-\frac{f^{a+\frac{b}{x^2}}}{2bx\log(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^2)/x^4,x]
```

```
[Out] (f^a*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[f]])/x])/(4*b^(3/2)*Log[f]^(3/2)) - f^
(a + b/x^2)/(2*b*x*Log[f])
```

fricas [A] time = 0.42, size = 58, normalized size = 0.92

$$-\frac{\sqrt{\pi}\sqrt{-b\log(f)}\,f^a x\operatorname{erf}\left(\frac{\sqrt{-b\log(f)}}{x}\right)+2\,bf^{\frac{ax^2+b}{x^2}}\log(f)}{4\,b^2x\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^4,x, algorithm="fricas")
```

```
[Out] -1/4*(sqrt(pi)*sqrt(-b*log(f))*f^a*x*erf(sqrt(-b*log(f))/x) + 2*b*f^((a*x^2
 + b)/x^2)*log(f))/(b^2*x*log(f)^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+\frac{b}{x^2}}}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^4,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^2)/x^4, x)
```

maple [A] time = 0.06, size = 58, normalized size = 0.92

$$\frac{\sqrt{\pi}\, f^{a} \operatorname{erf}\left(\frac{\sqrt{-b\ln(f)}}{x}\right)}{4\sqrt{-b\ln(f)}\; b\ln(f)}-\frac{f^{a} f^{\frac{b}{x^{2}}}}{2bx\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2)/x^4,x)
```

```
[Out] -1/2*f^a*f^(b/x^2)/x/b/ln(f)+1/4*f^a/ln(f)/b*Pi^(1/2)/(-b*ln(f))^(1/2)*erf(
(-b*ln(f))^(1/2)/x)
```

maxima [A] time = 1.49, size = 28, normalized size = 0.44

$$\frac{f^{a}\Gamma\left(\frac{3}{2},-\frac{b\log(f)}{x^{2}}\right)}{2\,x^{3}\left(-\frac{b\log(f)}{x^{2}}\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^4,x, algorithm="maxima")
```

```
[Out] 1/2*f^a*gamma(3/2, -b*log(f)/x^2)/(x^3*(-b*log(f)/x^2)^(3/2))
```

mupad [B] time = 3.56, size = 58, normalized size = 0.92

$$\frac{f^{a}\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b\,\ln(f)}{x\,\sqrt{b\,\ln(f)}}\right)}{4\,b\,\ln(f)\,\sqrt{b\,\ln(f)}}-\frac{f^{a}\,f^{\frac{b}{x^{2}}}}{2\,b\,x\,\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)/x^4,x)
```

```
[Out] (f^a*pi^(1/2)*erfi((b*log(f))/(x*(b*log(f))^(1/2))))/(4*b*log(f)*(b*log(f))
^(1/2)) - (f^a*f^(b/x^2))/(2*b*x*log(f))
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)/x**4,x)
```

```
[Out] Timed out
```

3.149 $\int \frac{f^{a+\frac{b}{x^2}}}{x^6} dx$

Optimal. Leaf size=86

$$-\frac{3\sqrt{\pi} f^a \text{erfi}\left(\frac{\sqrt{b}\sqrt{\log(f)}}{x}\right)}{8b^{5/2}\log^{\frac{5}{2}}(f)}+\frac{3f^{a+\frac{b}{x^2}}}{4b^2x\log^2(f)}-\frac{f^{a+\frac{b}{x^2}}}{2bx^3\log(f)}$$

```
[Out] 3/4*f^(a+b/x^2)/b^2/x/ln(f)^2-1/2*f^(a+b/x^2)/b/x^3/ln(f)-3/8*f^a*erfi(b^(1
/2)*ln(f)^(1/2)/x)*Pi^(1/2)/b^(5/2)/ln(f)^(5/2)
```

Rubi [A] time = 0.08, antiderivative size = 86, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231, Rules used = {2212, 2211, 2204}

$$-\frac{3\sqrt{\pi} f^a \text{Erfi}\left(\frac{\sqrt{b}\sqrt{\log(f)}}{x}\right)}{8b^{5/2}\log^{\frac{5}{2}}(f)}+\frac{3f^{a+\frac{b}{x^2}}}{4b^2x\log^2(f)}-\frac{f^{a+\frac{b}{x^2}}}{2bx^3\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2)/x^6,x]
```

```
[Out] (-3*f^a*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[f]])/x])/(8*b^(5/2)*Log[f]^(5/2)) +
 (3*f^(a + b/x^2))/(4*b^2*x*Log[f]^2) - f^(a + b/x^2)/(2*b*x^3*Log[f])
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2211

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
```

```
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\begin{aligned}\int \frac{f^{a+\frac{b}{x^2}}}{x^6}\,dx &= -\frac{f^{a+\frac{b}{x^2}}}{2bx^3\log(f)}-\frac{3\int \frac{f^{a+\frac{b}{x^2}}}{x^4}\,dx}{2b\log(f)}\\ &= \frac{3f^{a+\frac{b}{x^2}}}{4b^2x\log^2(f)}-\frac{f^{a+\frac{b}{x^2}}}{2bx^3\log(f)}+\frac{3\int \frac{f^{a+\frac{b}{x^2}}}{x^2}\,dx}{4b^2\log^2(f)}\\ &= \frac{3f^{a+\frac{b}{x^2}}}{4b^2x\log^2(f)}-\frac{f^{a+\frac{b}{x^2}}}{2bx^3\log(f)}-\frac{3\,\mathrm{Subst}\left(\int f^{a+bx^2}\,dx,x,\frac{1}{x}\right)}{4b^2\log^2(f)}\\ &= -\frac{3f^a\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{b}\sqrt{\log(f)}}{x}\right)}{8b^{5/2}\log^{\frac{5}{2}}(f)}+\frac{3f^{a+\frac{b}{x^2}}}{4b^2x\log^2(f)}-\frac{f^{a+\frac{b}{x^2}}}{2bx^3\log(f)}\end{aligned}$$

Mathematica [A] time = 0.05, size = 74, normalized size = 0.86

$$\frac{f^{a+\frac{b}{x^2}}\left(3x^2-2b\log(f)\right)}{4b^2x^3\log^2(f)}-\frac{3\sqrt{\pi}\,f^a\mathrm{erfi}\left(\frac{\sqrt{b}\sqrt{\log(f)}}{x}\right)}{8b^{5/2}\log^{\frac{5}{2}}(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^2)/x^6,x]
```

```
[Out] (-3*f^a*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[f]])/x])/(8*b^(5/2)*Log[f]^(5/2)) +
 (f^(a + b/x^2)*(3*x^2 - 2*b*Log[f]))/(4*b^2*x^3*Log[f]^2)
```

fricas [A] time = 0.42, size = 76, normalized size = 0.88

$$\frac{3\sqrt{\pi}\sqrt{-b\log(f)}\,f^a x^3\,\mathrm{erf}\left(\frac{\sqrt{-b\log(f)}}{x}\right)+2\left(3\,bx^2\log(f)-2\,b^2\log(f)^2\right)f^{\frac{ax^2+b}{x^2}}}{8\,b^3x^3\log(f)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^6,x, algorithm="fricas")
```

```
[Out] 1/8*(3*sqrt(pi)*sqrt(-b*log(f))*f^a*x^3*erf(sqrt(-b*log(f))/x) + 2*(3*b*x^2
*log(f) - 2*b^2*log(f)^2)*f^((a*x^2 + b)/x^2))/(b^3*x^3*log(f)^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+\frac{b}{x^2}}}{x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^6,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^2)/x^6, x)
```

maple [A] time = 0.06, size = 80, normalized size = 0.93

$$-\frac{3\sqrt{\pi}\, f^a \operatorname{erf}\left(\frac{\sqrt{-b\ln(f)}}{x}\right)}{8\sqrt{-b\ln(f)}\, b^2\ln(f)^2}-\frac{f^a f^{\frac{b}{x^2}}}{2b\,x^3\ln(f)}+\frac{3f^a f^{\frac{b}{x^2}}}{4b^2 x\ln(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2)/x^6,x)
```

```
[Out] -1/2*f^a*f^(b/x^2)/x^3/b/ln(f)+3/4*f^a/ln(f)^2/b^2*f^(b/x^2)/x-3/8*f^a/ln(f
)^2/b^2*Pi^(1/2)/(-b*ln(f))^(1/2)*erf((-b*ln(f))^(1/2)/x)
```

maxima [A] time = 1.27, size = 28, normalized size = 0.33

$$\frac{f^a\Gamma\left(\frac{5}{2}, -\frac{b\log(f)}{x^2}\right)}{2\,x^5\left(-\frac{b\log(f)}{x^2}\right)^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^6,x, algorithm="maxima")
```

```
[Out] 1/2*f^a*gamma(5/2, -b*log(f)/x^2)/(x^5*(-b*log(f)/x^2)^(5/2))
```

mupad [B] time = 3.59, size = 79, normalized size = 0.92

$$-\frac{f^a\left(3\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b\,\ln(f)}{x\sqrt{b\,\ln(f)}}\right)-\frac{6\,f^{\frac{b}{x^2}}\sqrt{b\,\ln(f)}}{x}\right)}{8\,b^2\ln(f)^2\sqrt{b\,\ln(f)}}-\frac{f^a\,f^{\frac{b}{x^2}}}{2\,b\,x^3\,\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)/x^6,x)
```

```
[Out] - (f^a*(3*pi^(1/2)*erfi((b*log(f))/(x*(b*log(f))^(1/2))) - (6*f^(b/x^2)*(b*
log(f))^(1/2))/x))/(8*b^2*log(f)^2*(b*log(f))^(1/2)) - (f^a*f^(b/x^2))/(2*b
*x^3*log(f))
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)/x**6,x)
```

```
[Out] Timed out
```

3.150 $\int \frac{f^{a+\frac{b}{x^2}}}{x^8}\,dx$

Optimal. Leaf size=109

$$\frac{15\sqrt{\pi}\, f^a \text{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(f)}}{x}\right)}{16b^{7/2}\log^{\frac{7}{2}}(f)}-\frac{15f^{a+\frac{b}{x^2}}}{8b^3x\log^3(f)}+\frac{5f^{a+\frac{b}{x^2}}}{4b^2x^3\log^2(f)}-\frac{f^{a+\frac{b}{x^2}}}{2bx^5\log(f)}$$

```
[Out] -15/8*f^(a+b/x^2)/b^3/x/ln(f)^3+5/4*f^(a+b/x^2)/b^2/x^3/ln(f)^2-1/2*f^(a+b/
x^2)/b/x^5/ln(f)+15/16*f^a*erfi(b^(1/2)*ln(f)^(1/2)/x)*Pi^(1/2)/b^(7/2)/ln(
f)^(7/2)
```

Rubi [A] time = 0.11, antiderivative size = 109, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231, Rules used = {2212, 2211, 2204}

$$\frac{15\sqrt{\pi}\, f^a \text{Erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(f)}}{x}\right)}{16b^{7/2}\log^{\frac{7}{2}}(f)}+\frac{5f^{a+\frac{b}{x^2}}}{4b^2x^3\log^2(f)}-\frac{15f^{a+\frac{b}{x^2}}}{8b^3x\log^3(f)}-\frac{f^{a+\frac{b}{x^2}}}{2bx^5\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2)/x^8,x]
```

```
[Out] (15*f^a*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[f]])/x])/(16*b^(7/2)*Log[f]^(7/2))
- (15*f^(a + b/x^2))/(8*b^3*x*Log[f]^3) + (5*f^(a + b/x^2))/(4*b^2*x^3*Log[
f]^2) - f^(a + b/x^2)/(2*b*x^5*Log[f])
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2211

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\begin{aligned}
\int \frac{f^{a+\frac{b}{x^2}}}{x^8}\,dx &= -\frac{f^{a+\frac{b}{x^2}}}{2bx^5\log(f)}-\frac{5\int \frac{f^{a+\frac{b}{x^2}}}{x^6}\,dx}{2b\log(f)}\\
&= \frac{5f^{a+\frac{b}{x^2}}}{4b^2x^3\log^2(f)}-\frac{f^{a+\frac{b}{x^2}}}{2bx^5\log(f)}+\frac{15\int \frac{f^{a+\frac{b}{x^2}}}{x^4}\,dx}{4b^2\log^2(f)}\\
&= -\frac{15f^{a+\frac{b}{x^2}}}{8b^3x\log^3(f)}+\frac{5f^{a+\frac{b}{x^2}}}{4b^2x^3\log^2(f)}-\frac{f^{a+\frac{b}{x^2}}}{2bx^5\log(f)}-\frac{15\int \frac{f^{a+\frac{b}{x^2}}}{x^2}\,dx}{8b^3\log^3(f)}\\
&= -\frac{15f^{a+\frac{b}{x^2}}}{8b^3x\log^3(f)}+\frac{5f^{a+\frac{b}{x^2}}}{4b^2x^3\log^2(f)}-\frac{f^{a+\frac{b}{x^2}}}{2bx^5\log(f)}+\frac{15\,\mathrm{Subst}\left(\int f^{a+bx^2}\,dx,x,\frac{1}{x}\right)}{8b^3\log^3(f)}\\
&= \frac{15f^a\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{b}\sqrt{\log(f)}}{x}\right)}{16b^{7/2}\log^{\frac{7}{2}}(f)}-\frac{15f^{a+\frac{b}{x^2}}}{8b^3x\log^3(f)}+\frac{5f^{a+\frac{b}{x^2}}}{4b^2x^3\log^2(f)}-\frac{f^{a+\frac{b}{x^2}}}{2bx^5\log(f)}
\end{aligned}$$

Mathematica [A] time = 0.06, size = 86, normalized size = 0.79

$$\frac{15\sqrt{\pi}\,f^a\mathrm{erfi}\left(\frac{\sqrt{b}\sqrt{\log(f)}}{x}\right)}{16b^{7/2}\log^{\frac{7}{2}}(f)}-\frac{f^{a+\frac{b}{x^2}}\left(4b^2\log^2(f)-10bx^2\log(f)+15x^4\right)}{8b^3x^5\log^3(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^2)/x^8,x]
```

```
[Out] (15*f^a*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[f]])/x])/(16*b^(7/2)*Log[f]^(7/2))
- (f^(a + b/x^2)*(15*x^4 - 10*b*x^2*Log[f] + 4*b^2*Log[f]^2))/(8*b^3*x^5*Lo
g[f]^3)
```

fricas [A] time = 0.41, size = 88, normalized size = 0.81

$$-\frac{15\sqrt{\pi}\sqrt{-b\log(f)}f^{a}x^{5}\operatorname{erf}\left(\frac{\sqrt{-b\log(f)}}{x}\right)+2\left(15\,bx^{4}\log(f)-10\,b^{2}x^{2}\log(f)^{2}+4\,b^{3}\log(f)^{3}\right)f^{\frac{ax^{2}+b}{x^{2}}}}{16\,b^{4}x^{5}\log(f)^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^8,x, algorithm="fricas")
```

```
[Out] -1/16*(15*sqrt(pi)*sqrt(-b*log(f))*f^a*x^5*erf(sqrt(-b*log(f))/x) + 2*(15*b
*x^4*log(f) - 10*b^2*x^2*log(f)^2 + 4*b^3*log(f)^3)*f^((a*x^2 + b)/x^2))/(b
^4*x^5*log(f)^4)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{f^{a+\frac{b}{x^{2}}}}{x^{8}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^8,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^2)/x^8, x)
```

maple [A] time = 0.07, size = 102, normalized size = 0.94

$$\frac{15\sqrt{\pi}\,f^{a}\operatorname{erf}\left(\frac{\sqrt{-b\ln(f)}}{x}\right)}{16\sqrt{-b\ln(f)}\,b^{3}\ln(f)^{3}}-\frac{f^{a}f^{\frac{b}{x^{2}}}}{2b\,x^{5}\ln(f)}+\frac{5f^{a}f^{\frac{b}{x^{2}}}}{4b^{2}x^{3}\ln(f)^{2}}-\frac{15f^{a}f^{\frac{b}{x^{2}}}}{8b^{3}x\ln(f)^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2)/x^8,x)
```

```
[Out] -1/2*f^a*f^(b/x^2)/x^5/b/ln(f)+5/4*f^a/ln(f)^2/b^2*f^(b/x^2)/x^3-15/8*f^a/l
n(f)^3/b^3*f^(b/x^2)/x+15/16*f^a/ln(f)^3/b^3*Pi^(1/2)/(-b*ln(f))^(1/2)*erf(
(-b*ln(f))^(1/2)/x)
```

maxima [A] time = 1.27, size = 28, normalized size = 0.26

$$\frac{f^{a}\Gamma\left(\frac{7}{2},-\frac{b\log(f)}{x^{2}}\right)}{2\,x^{7}\left(-\frac{b\log(f)}{x^{2}}\right)^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^8,x, algorithm="maxima")
```

```
[Out] 1/2*f^a*gamma(7/2, -b*log(f)/x^2)/(x^7*(-b*log(f)/x^2)^(7/2))
```

mupad [B] time = 3.66, size = 102, normalized size = 0.94

$$\frac{5\,f^a\,f^{\frac{b}{x^2}}}{4\,b^2\,x^3\,\ln(f)^2}-\frac{f^a\,f^{\frac{b}{x^2}}}{2\,b\,x^5\,\ln(f)}-\frac{15\,f^a\,f^{\frac{b}{x^2}}}{8\,b^3\,x\,\ln(f)^3}+\frac{15\,f^a\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\,\ln(f)}{x\,\sqrt{b\,\ln(f)}}\right)}{16\,b^3\,\ln(f)^3\,\sqrt{b\,\ln(f)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)/x^8,x)
```

```
[Out] (5*f^a*f^(b/x^2))/(4*b^2*x^3*log(f)^2) - (f^a*f^(b/x^2))/(2*b*x^5*log(f)) -
 (15*f^a*f^(b/x^2))/(8*b^3*x*log(f)^3) + (15*f^a*pi^(1/2)*erfi((b*log(f))/(
x*(b*log(f))^(1/2))))/(16*b^3*log(f)^3*(b*log(f))^(1/2))
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)/x**8,x)
```

```
[Out] Timed out
```

3.151 $\int \frac{f^{a+\frac{b}{x^2}}}{x^{10}}\,dx$

Optimal. Leaf size=132

$$-\frac{105\sqrt{\pi}\,f^a\text{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(f)}}{x}\right)}{32b^{9/2}\log^{\frac{9}{2}}(f)}+\frac{105f^{a+\frac{b}{x^2}}}{16b^4x\log^4(f)}-\frac{35f^{a+\frac{b}{x^2}}}{8b^3x^3\log^3(f)}+\frac{7f^{a+\frac{b}{x^2}}}{4b^2x^5\log^2(f)}-\frac{f^{a+\frac{b}{x^2}}}{2bx^7\log(f)}$$

```
[Out] 105/16*f^(a+b/x^2)/b^4/x/ln(f)^4-35/8*f^(a+b/x^2)/b^3/x^3/ln(f)^3+7/4*f^(a+
b/x^2)/b^2/x^5/ln(f)^2-1/2*f^(a+b/x^2)/b/x^7/ln(f)-105/32*f^a*erfi(b^(1/2)*
ln(f)^(1/2)/x)*Pi^(1/2)/b^(9/2)/ln(f)^(9/2)
```

Rubi [A] time = 0.16, antiderivative size = 132, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231, Rules used = {2212, 2211, 2204}

$$-\frac{105\sqrt{\pi}\,f^a\text{Erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(f)}}{x}\right)}{32b^{9/2}\log^{\frac{9}{2}}(f)}+\frac{7f^{a+\frac{b}{x^2}}}{4b^2x^5\log^2(f)}-\frac{35f^{a+\frac{b}{x^2}}}{8b^3x^3\log^3(f)}+\frac{105f^{a+\frac{b}{x^2}}}{16b^4x\log^4(f)}-\frac{f^{a+\frac{b}{x^2}}}{2bx^7\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2)/x^10,x]
```

```
[Out] (-105*f^a*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[f]])/x])/(32*b^(9/2)*Log[f]^(9/2)
) + (105*f^(a + b/x^2))/(16*b^4*x*Log[f]^4) - (35*f^(a + b/x^2))/(8*b^3*x^3
*Log[f]^3) + (7*f^(a + b/x^2))/(4*b^2*x^5*Log[f]^2) - f^(a + b/x^2)/(2*b*x^
7*Log[f])
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2211

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$
\begin{aligned}
\int \frac{f^{a+\frac{b}{x^2}}}{x^{10}}\,dx &= -\frac{f^{a+\frac{b}{x^2}}}{2bx^7\log(f)}-\frac{7\int \frac{f^{a+\frac{b}{x^2}}}{x^8}\,dx}{2b\log(f)}\\
&= \frac{7f^{a+\frac{b}{x^2}}}{4b^2x^5\log^2(f)}-\frac{f^{a+\frac{b}{x^2}}}{2bx^7\log(f)}+\frac{35\int \frac{f^{a+\frac{b}{x^2}}}{x^6}\,dx}{4b^2\log^2(f)}\\
&= -\frac{35f^{a+\frac{b}{x^2}}}{8b^3x^3\log^3(f)}+\frac{7f^{a+\frac{b}{x^2}}}{4b^2x^5\log^2(f)}-\frac{f^{a+\frac{b}{x^2}}}{2bx^7\log(f)}-\frac{105\int \frac{f^{a+\frac{b}{x^2}}}{x^4}\,dx}{8b^3\log^3(f)}\\
&= \frac{105f^{a+\frac{b}{x^2}}}{16b^4x\log^4(f)}-\frac{35f^{a+\frac{b}{x^2}}}{8b^3x^3\log^3(f)}+\frac{7f^{a+\frac{b}{x^2}}}{4b^2x^5\log^2(f)}-\frac{f^{a+\frac{b}{x^2}}}{2bx^7\log(f)}+\frac{105\int \frac{f^{a+\frac{b}{x^2}}}{x^2}\,dx}{16b^4\log^4(f)}\\
&= \frac{105f^{a+\frac{b}{x^2}}}{16b^4x\log^4(f)}-\frac{35f^{a+\frac{b}{x^2}}}{8b^3x^3\log^3(f)}+\frac{7f^{a+\frac{b}{x^2}}}{4b^2x^5\log^2(f)}-\frac{f^{a+\frac{b}{x^2}}}{2bx^7\log(f)}-\frac{105\,\text{Subst}\left(\int f^{a+bx^2}\,dx,x,\frac{1}{x}\right)}{16b^4\log^4(f)}\\
&= -\frac{105f^a\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{b}\sqrt{\log(f)}}{x}\right)}{32b^{9/2}\log^{\frac{9}{2}}(f)}+\frac{105f^{a+\frac{b}{x^2}}}{16b^4x\log^4(f)}-\frac{35f^{a+\frac{b}{x^2}}}{8b^3x^3\log^3(f)}+\frac{7f^{a+\frac{b}{x^2}}}{4b^2x^5\log^2(f)}-\frac{f^{a+\frac{b}{x^2}}}{2bx^7\log(f)}
\end{aligned}
$$

Mathematica [A] time = 0.09, size = 100, normalized size = 0.76

$$
\frac{f^a\left(\frac{2\sqrt{b}\sqrt{\log(f)}\,f^{\frac{b}{x^2}}\left(-8b^3\log^3(f)+28b^2x^2\log^2(f)-70bx^4\log(f)+105x^6\right)}{x^7}-105\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{b}\sqrt{\log(f)}}{x}\right)\right)}{32b^{9/2}\log^{\frac{9}{2}}(f)}
$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^2)/x^10,x]
```

```
[Out] (f^a*(-105*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[f]])/x] + (2*Sqrt[b]*f^(b/x^2)*S
qrt[Log[f]]*(105*x^6 - 70*b*x^4*Log[f] + 28*b^2*x^2*Log[f]^2 - 8*b^3*Log[f]
^3))/x^7))/(32*b^(9/2)*Log[f]^(9/2))
```

fricas [A] time = 0.44, size = 100, normalized size = 0.76

$$\frac{105\,\sqrt{\pi}\,\sqrt{-b\log\left(f\right)}\,f^{a}x^{7}\,\mathrm{erf}\left(\frac{\sqrt{-b\log\left(f\right)}}{x}\right)+2\,\left(105\,bx^{6}\log\left(f\right)-70\,b^{2}x^{4}\log\left(f\right)^{2}+28\,b^{3}x^{2}\log\left(f\right)^{3}-8\,b^{4}\log\left(f\right)^{4}\right)}{32\,b^{5}x^{7}\log\left(f\right)^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^10,x, algorithm="fricas")
```

```
[Out] 1/32*(105*sqrt(pi)*sqrt(-b*log(f))*f^a*x^7*erf(sqrt(-b*log(f))/x) + 2*(105*
b*x^6*log(f) - 70*b^2*x^4*log(f)^2 + 28*b^3*x^2*log(f)^3 - 8*b^4*log(f)^4)*
f^((a*x^2 + b)/x^2))/(b^5*x^7*log(f)^5)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+\frac{b}{x^{2}}}}{x^{10}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^10,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^2)/x^10, x)
```

maple [A] time = 0.09, size = 124, normalized size = 0.94

$$-\frac{105\sqrt{\pi}\;f^{a}\,\mathrm{erf}\left(\frac{\sqrt{-b\ln\left(f\right)}}{x}\right)}{32\sqrt{-b\ln\left(f\right)}\;b^{4}\ln\left(f\right)^{4}}-\frac{f^{a}f^{\frac{b}{x^{2}}}}{2b\,x^{7}\ln\left(f\right)}+\frac{7f^{a}f^{\frac{b}{x^{2}}}}{4b^{2}x^{5}\ln\left(f\right)^{2}}-\frac{35f^{a}f^{\frac{b}{x^{2}}}}{8b^{3}x^{3}\ln\left(f\right)^{3}}+\frac{105f^{a}f^{\frac{b}{x^{2}}}}{16b^{4}x\ln\left(f\right)^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2)/x^10,x)
```

```
[Out] -1/2*f^a*f^(b/x^2)/x^7/b/ln(f)+7/4*f^a/ln(f)^2/b^2*f^(b/x^2)/x^5-35/8*f^a/l
n(f)^3/b^3*f^(b/x^2)/x^3+105/16*f^a/ln(f)^4/b^4*f^(b/x^2)/x-105/32*f^a/ln(f
)^4/b^4*Pi^(1/2)/(-b*ln(f))^(1/2)*erf((-b*ln(f))^(1/2)/x)
```

maxima [A] time = 1.31, size = 28, normalized size = 0.21

$$\frac{f^{a}\Gamma\left(\frac{9}{2},-\frac{b\log\left(f\right)}{x^{2}}\right)}{2\,x^{9}\left(-\frac{b\log\left(f\right)}{x^{2}}\right)^{\frac{9}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^10,x, algorithm="maxima")
```

```
[Out] 1/2*f^a*gamma(9/2, -b*log(f)/x^2)/(x^9*(-b*log(f)/x^2)^(9/2))
```

mupad [B] time = 3.69, size = 121, normalized size = 0.92

$$-\frac{\frac{f^a\left(105\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\ln(f)}{x\sqrt{b\ln(f)}}\right)-\frac{210\,f^{\frac{b}{x^2}}\sqrt{b\ln(f)}}{x}\right)}{32\sqrt{b\ln(f)}}-\frac{7\,b^2\,f^a\,f^{\frac{b}{x^2}}\ln(f)^2}{4\,x^5}+\frac{b^3\,f^a\,f^{\frac{b}{x^2}}\ln(f)^3}{2\,x^7}+\frac{35\,b\,f^a\,f^{\frac{b}{x^2}}\ln(f)}{8\,x^3}}{b^4\ln(f)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)/x^10,x)
```

```
[Out] -((f^a*(105*pi^(1/2)*erfi((b*log(f))/(x*(b*log(f))^(1/2))) - (210*f^(b/x^2)
*(b*log(f))^(1/2))/x))/(32*(b*log(f))^(1/2)) - (7*b^2*f^a*f^(b/x^2)*log(f)^
2)/(4*x^5) + (b^3*f^a*f^(b/x^2)*log(f)^3)/(2*x^7) + (35*b*f^a*f^(b/x^2)*log
(f))/(8*x^3))/(b^4*log(f)^4)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)/x**10,x)
```

```
[Out] Timed out
```

3.152 $\int \frac{f^{a+\frac{b}{x^2}}}{x^{12}} \, dx$

Optimal. Leaf size=34

$$\frac{f^a \Gamma\left(\frac{11}{2}, -\frac{b \log(f)}{x^2}\right)}{2x^{11}\left(-\frac{b \log(f)}{x^2}\right)^{11/2}}$$

```
[Out] 1/2*f^a*(1048576/61836869254970658257624840625*GAMMA(51/2,-b*ln(f)/x^2)-104
8576/61836869254970658257624840625*(-b*ln(f)/x^2)^(49/2)*exp(b*ln(f)/x^2)-5
24288/1261976923570829760359690625*(-b*ln(f)/x^2)^(47/2)*exp(b*ln(f)/x^2)-2
62144/26850572841932548092759375*(-b*ln(f)/x^2)^(45/2)*exp(b*ln(f)/x^2)-131
072/596679396487389957616875*(-b*ln(f)/x^2)^(43/2)*exp(b*ln(f)/x^2)-65536/1
3876265034590464130625*(-b*ln(f)/x^2)^(41/2)*exp(b*ln(f)/x^2)-32768/3384454
88648547905625*(-b*ln(f)/x^2)^(39/2)*exp(b*ln(f)/x^2)-16384/867808945252686
9375*(-b*ln(f)/x^2)^(37/2)*exp(b*ln(f)/x^2)-8192/234542958176401875*(-b*ln(
f)/x^2)^(35/2)*exp(b*ln(f)/x^2)-4096/6701227376468625*(-b*ln(f)/x^2)^(33/2)
*exp(b*ln(f)/x^2)-2048/203067496256625*(-b*ln(f)/x^2)^(31/2)*exp(b*ln(f)/x^
2)-1024/6550564395375*(-b*ln(f)/x^2)^(29/2)*exp(b*ln(f)/x^2)-512/2258815308
75*(-b*ln(f)/x^2)^(27/2)*exp(b*ln(f)/x^2)-256/8365982625*(-b*ln(f)/x^2)^(25
/2)*exp(b*ln(f)/x^2)-128/334639305*(-b*ln(f)/x^2)^(23/2)*exp(b*ln(f)/x^2)-6
4/14549535*(-b*ln(f)/x^2)^(21/2)*exp(b*ln(f)/x^2)-32/692835*(-b*ln(f)/x^2)^
(19/2)*exp(b*ln(f)/x^2)-16/36465*(-b*ln(f)/x^2)^(17/2)*exp(b*ln(f)/x^2)-8/2
145*(-b*ln(f)/x^2)^(15/2)*exp(b*ln(f)/x^2)-4/143*(-b*ln(f)/x^2)^(13/2)*exp(
b*ln(f)/x^2)-2/11*(-b*ln(f)/x^2)^(11/2)*exp(b*ln(f)/x^2))/x^11/(-b*ln(f)/x^
2)^(11/2)
```

Rubi [A] time = 0.03, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2218}

$$\frac{f^a \text{Gamma}\left(\frac{11}{2}, -\frac{b \log(f)}{x^2}\right)}{2x^{11}\left(-\frac{b \log(f)}{x^2}\right)^{11/2}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2)/x^12,x]
```

```
[Out] (f^a*Gamma[11/2, -((b*Log[f])/x^2)])/(2*x^11*(-((b*Log[f])/x^2))^(11/2))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
```

```
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x^2}}}{x^{12}}\,dx = \frac{f^a\Gamma\left(\frac{11}{2},-\frac{b\log(f)}{x^2}\right)}{2x^{11}\left(-\frac{b\log(f)}{x^2}\right)^{11/2}}$$

Mathematica [A] time = 0.01, size = 34, normalized size = 1.00

$$\frac{f^a\Gamma\left(\frac{11}{2},-\frac{b\log(f)}{x^2}\right)}{2x^{11}\left(-\frac{b\log(f)}{x^2}\right)^{11/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^2)/x^12,x]
[Out] (f^a*Gamma[11/2, -((b*Log[f])/x^2)])/(2*x^11*(-((b*Log[f])/x^2))^(11/2))
```

fricas [A] time = 0.44, size = 112, normalized size = 3.29

$$-\frac{945\sqrt{\pi}\sqrt{-b\log(f)}\,f^a x^9\,\mathrm{erf}\left(\frac{\sqrt{-b\log(f)}}{x}\right)+2\left(945\,bx^8\log(f)-630\,b^2x^6\log(f)^2+252\,b^3x^4\log(f)^3-72\,b^4x^2\log(f)^4+16\,b^5\log(f)^5\right)f^{\frac{ax^2+b}{x^2}}}{64\,b^6x^9\log(f)^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^12,x, algorithm="fricas")
[Out] -1/64*(945*sqrt(pi)*sqrt(-b*log(f))*f^a*x^9*erf(sqrt(-b*log(f))/x) + 2*(945
*b*x^8*log(f) - 630*b^2*x^6*log(f)^2 + 252*b^3*x^4*log(f)^3 - 72*b^4*x^2*lo
g(f)^4 + 16*b^5*log(f)^5)*f^((a*x^2 + b)/x^2))/(b^6*x^9*log(f)^6)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+\frac{b}{x^2}}}{x^{12}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^12,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^2)/x^12, x)
```

maple [A] time = 0.12, size = 146, normalized size = 4.29

$$\frac{945\sqrt{\pi}\, f^{a} \operatorname{erf}\left(\frac{\sqrt{-b\ln(f)}}{x}\right)}{64\sqrt{-b\ln(f)}\, b^{5}\ln(f)^{5}}-\frac{f^{a} f^{\frac{b}{x^{2}}}}{2b\, x^{9}\ln(f)}+\frac{9f^{a} f^{\frac{b}{x^{2}}}}{4b^{2}x^{7}\ln(f)^{2}}-\frac{63f^{a} f^{\frac{b}{x^{2}}}}{8b^{3}x^{5}\ln(f)^{3}}+\frac{315f^{a} f^{\frac{b}{x^{2}}}}{16b^{4}x^{3}\ln(f)^{4}}-\frac{945f^{a} f^{\frac{b}{x^{2}}}}{32b^{5}x\ln(f)^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2)/x^12,x)
```

```
[Out] -1/2*f^a*f^(b/x^2)/x^9/b/ln(f)+9/4*f^a/ln(f)^2/b^2*f^(b/x^2)/x^7-63/8*f^a/l
n(f)^3/b^3*f^(b/x^2)/x^5+315/16*f^a/ln(f)^4/b^4*f^(b/x^2)/x^3-945/32*f^a/ln
(f)^5/b^5*f^(b/x^2)/x+945/64*f^a/ln(f)^5/b^5*Pi^(1/2)/(-b*ln(f))^(1/2)*erf(
(-b*ln(f))^(1/2)/x)
```

maxima [A] time = 1.28, size = 28, normalized size = 0.82

$$\frac{f^{a}\Gamma\left(\frac{11}{2},-\frac{b\log(f)}{x^{2}}\right)}{2\,x^{11}\left(-\frac{b\log(f)}{x^{2}}\right)^{\frac{11}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^12,x, algorithm="maxima")
```

```
[Out] 1/2*f^a*gamma(11/2, -b*log(f)/x^2)/(x^11*(-b*log(f)/x^2)^(11/2))
```

mupad [B] time = 3.71, size = 142, normalized size = 4.18

$$\frac{\frac{f^{a}\left(945\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b\,\ln(f)}{x\,\sqrt{b\,\ln(f)}}\right)-\frac{1890\,f^{\frac{b}{x^{2}}}\,\sqrt{b\,\ln(f)}}{x}\right)}{64\,\sqrt{b\,\ln(f)}}-\frac{63\,b^{2}\,f^{a}\,f^{\frac{b}{x^{2}}}\,\ln(f)^{2}}{8\,x^{5}}+\frac{9\,b^{3}\,f^{a}\,f^{\frac{b}{x^{2}}}\,\ln(f)^{3}}{4\,x^{7}}-\frac{b^{4}\,f^{a}\,f^{\frac{b}{x^{2}}}\,\ln(f)^{4}}{2\,x^{9}}+\frac{315\,b\,f^{a}\,f^{\frac{b}{x^{2}}}\,\ln(f)}{16\,x^{3}}}{b^{5}\,\ln(f)^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)/x^12,x)
```

```
[Out] ((f^a*(945*pi^(1/2)*erfi((b*log(f))/(x*(b*log(f))^(1/2))) - (1890*f^(b/x^2)
*(b*log(f))^(1/2))/x))/(64*(b*log(f))^(1/2)) - (63*b^2*f^a*f^(b/x^2)*log(f)
^2)/(8*x^5) + (9*b^3*f^a*f^(b/x^2)*log(f)^3)/(4*x^7) - (b^4*f^a*f^(b/x^2)*l
og(f)^4)/(2*x^9) + (315*b*f^a*f^(b/x^2)*log(f))/(16*x^3))/(b^5*log(f)^5)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)/x**12,x)
```

```
[Out] Timed out
```

3.153 $\int \frac{f^{a+\frac{b}{x^2}}}{x^{14}}\,dx$

Optimal. Leaf size=34

$$\frac{f^a\Gamma\left(\frac{13}{2},-\frac{b\log(f)}{x^2}\right)}{2x^{13}\left(-\frac{b\log(f)}{x^2}\right)^{13/2}}$$

```
[Out] 1/2*f^a*(524288/5621533568633696205238621875*GAMMA(51/2,-b*ln(f)/x^2)-52428
8/5621533568633696205238621875*(-b*ln(f)/x^2)^(49/2)*exp(b*ln(f)/x^2)-26214
4/114725174870075432759971875*(-b*ln(f)/x^2)^(47/2)*exp(b*ln(f)/x^2)-131072
/2440961167448413462978125*(-b*ln(f)/x^2)^(45/2)*exp(b*ln(f)/x^2)-65536/542
43581498853632510625*(-b*ln(f)/x^2)^(43/2)*exp(b*ln(f)/x^2)-32768/126147863
9508224011875*(-b*ln(f)/x^2)^(41/2)*exp(b*ln(f)/x^2)-16384/3076777169532253
6875*(-b*ln(f)/x^2)^(39/2)*exp(b*ln(f)/x^2)-8192/788917222956988125*(-b*ln(
f)/x^2)^(37/2)*exp(b*ln(f)/x^2)-4096/21322087106945625*(-b*ln(f)/x^2)^(35/2
)*exp(b*ln(f)/x^2)-2048/609202488769875*(-b*ln(f)/x^2)^(33/2)*exp(b*ln(f)/x
^2)-1024/18460681477875*(-b*ln(f)/x^2)^(31/2)*exp(b*ln(f)/x^2)-512/59550585
4125*(-b*ln(f)/x^2)^(29/2)*exp(b*ln(f)/x^2)-256/20534684625*(-b*ln(f)/x^2)^
(27/2)*exp(b*ln(f)/x^2)-128/760543875*(-b*ln(f)/x^2)^(25/2)*exp(b*ln(f)/x^2
)-64/30421755*(-b*ln(f)/x^2)^(23/2)*exp(b*ln(f)/x^2)-32/1322685*(-b*ln(f)/x
^2)^(21/2)*exp(b*ln(f)/x^2)-16/62985*(-b*ln(f)/x^2)^(19/2)*exp(b*ln(f)/x^2)
-8/3315*(-b*ln(f)/x^2)^(17/2)*exp(b*ln(f)/x^2)-4/195*(-b*ln(f)/x^2)^(15/2)*
exp(b*ln(f)/x^2)-2/13*(-b*ln(f)/x^2)^(13/2)*exp(b*ln(f)/x^2))/x^13/(-b*ln(f
)/x^2)^(13/2)
```

Rubi [A] time = 0.02, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2218}

$$\frac{f^a\text{Gamma}\left(\frac{13}{2},-\frac{b\log(f)}{x^2}\right)}{2x^{13}\left(-\frac{b\log(f)}{x^2}\right)^{13/2}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^2)/x^14,x]
```

```
[Out] (f^a*Gamma[13/2, -((b*Log[f])/x^2)])/(2*x^13*(-((b*Log[f])/x^2))^(13/2))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
```

```
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x^2}}}{x^{14}}\,dx = \frac{f^a\Gamma\left(\frac{13}{2},-\frac{b\log(f)}{x^2}\right)}{2x^{13}\left(-\frac{b\log(f)}{x^2}\right)^{13/2}}$$

Mathematica [A] time = 0.01, size = 34, normalized size = 1.00

$$\frac{f^a\Gamma\left(\frac{13}{2},-\frac{b\log(f)}{x^2}\right)}{2x^{13}\left(-\frac{b\log(f)}{x^2}\right)^{13/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^2)/x^14,x]
[Out] (f^a*Gamma[13/2, -((b*Log[f])/x^2)])/(2*x^13*(-((b*Log[f])/x^2))^(13/2))
```

fricas [A] time = 0.42, size = 124, normalized size = 3.65

$$\frac{10395\sqrt{\pi}\sqrt{-b\log(f)}\,f^a x^{11}\operatorname{erf}\left(\frac{\sqrt{-b\log(f)}}{x}\right)+2\left(10395\,bx^{10}\log(f)-6930\,b^2x^8\log(f)^2+2772\,b^3x^6\log(f)^3-79\right.}{128\,b^7x^{11}\log(f)^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^14,x, algorithm="fricas")
[Out] 1/128*(10395*sqrt(pi)*sqrt(-b*log(f))*f^a*x^11*erf(sqrt(-b*log(f))/x) + 2*(
10395*b*x^10*log(f) - 6930*b^2*x^8*log(f)^2 + 2772*b^3*x^6*log(f)^3 - 792*b
^4*x^4*log(f)^4 + 176*b^5*x^2*log(f)^5 - 32*b^6*log(f)^6)*f^((a*x^2 + b)/x^
2))/(b^7*x^11*log(f)^7)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+\frac{b}{x^2}}}{x^{14}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^14,x, algorithm="giac")
[Out] integrate(f^(a + b/x^2)/x^14, x)
```

maple [A] time = 0.15, size = 168, normalized size = 4.94

$$-\frac{10395\sqrt{\pi}\, f^{a} \operatorname{erf}\left(\frac{\sqrt{-b\ln(f)}}{x}\right)}{128\sqrt{-b\ln(f)}\, b^{6}\ln(f)^{6}}-\frac{f^{a} f^{\frac{b}{x^{2}}}}{2b\,x^{11}\ln(f)}+\frac{11 f^{a} f^{\frac{b}{x^{2}}}}{4b^{2}x^{9}\ln(f)^{2}}-\frac{99 f^{a} f^{\frac{b}{x^{2}}}}{8b^{3}x^{7}\ln(f)^{3}}+\frac{693 f^{a} f^{\frac{b}{x^{2}}}}{16b^{4}x^{5}\ln(f)^{4}}-\frac{3465 f^{a} f^{\frac{b}{x^{2}}}}{32b^{5}x^{3}\ln(f)^{5}}+\frac{10395}{64b^{6}x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^2)/x^14,x)
[Out] -1/2*f^a*f^(b/x^2)/x^11/b/ln(f)+11/4*f^a/ln(f)^2/b^2*f^(b/x^2)/x^9-99/8*f^a
/ln(f)^3/b^3*f^(b/x^2)/x^7+693/16*f^a/ln(f)^4/b^4*f^(b/x^2)/x^5-3465/32*f^a
/ln(f)^5/b^5*f^(b/x^2)/x^3+10395/64*f^a/ln(f)^6/b^6*f^(b/x^2)/x-10395/128*f
^a/ln(f)^6/b^6*Pi^(1/2)/(-b*ln(f))^(1/2)*erf((-b*ln(f))^(1/2)/x)
```

maxima [A] time = 1.22, size = 28, normalized size = 0.82

$$\frac{f^{a}\Gamma\left(\frac{13}{2}, -\frac{b\log(f)}{x^{2}}\right)}{2\,x^{13}\left(-\frac{b\log(f)}{x^{2}}\right)^{\frac{13}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^2)/x^14,x, algorithm="maxima")
[Out] 1/2*f^a*gamma(13/2, -b*log(f)/x^2)/(x^13*(-b*log(f)/x^2)^(13/2))
```

mupad [B] time = 3.71, size = 159, normalized size = 4.68

$$-\frac{\frac{f^{a}\left(\frac{10395\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b\,\ln(f)}{x\,\sqrt{b\,\ln(f)}}\right)}{128}-\frac{10395\,f^{\frac{b}{x^{2}}}\,\sqrt{b\,\ln(f)}}{64\,x}\right)}{\sqrt{b\,\ln(f)}}-\frac{693\,b^{2}\,f^{a+\frac{b}{x^{2}}}\,\ln(f)^{2}}{16\,x^{5}}+\frac{99\,b^{3}\,f^{a+\frac{b}{x^{2}}}\,\ln(f)^{3}}{8\,x^{7}}-\frac{11\,b^{4}\,f^{a+\frac{b}{x^{2}}}\,\ln(f)^{4}}{4\,x^{9}}+\frac{b^{5}\,f^{a+\frac{b}{x^{2}}}\,\ln(f)^{5}}{2\,x^{11}}+34}{b^{6}\ln(f)^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^2)/x^14,x)
[Out] -((f^a*((10395*pi^(1/2)*erfi((b*log(f))/(x*(b*log(f))^(1/2))))/128 - (10395
*f^(b/x^2)*(b*log(f))^(1/2))/(64*x)))/(b*log(f))^(1/2) - (693*b^2*f^(a + b/
x^2)*log(f)^2)/(16*x^5) + (99*b^3*f^(a + b/x^2)*log(f)^3)/(8*x^7) - (11*b^4
```

```
*f^(a + b/x^2)*log(f)^4)/(4*x^9) + (b^5*f^(a + b/x^2)*log(f)^5)/(2*x^11) +
(3465*b*f^(a + b/x^2)*log(f))/(32*x^3))/(b^6*log(f)^6)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**2)/x**14,x)
```

```
[Out] Timed out
```

3.154 $\int f^{a+\frac{b}{x^3}} x^m \, dx$

Optimal. Leaf size=46

$$\frac{1}{3} f^a x^{m+1} \left(-\frac{b \log(f)}{x^3}\right)^{\frac{m+1}{3}} \Gamma\left(\frac{1}{3}(-m-1), -\frac{b \log(f)}{x^3}\right)$$

```
[Out] 1/3*f^a*x^(1+m)*GAMMA(-1/3-1/3*m,-b*ln(f)/x^3)*(-b*ln(f)/x^3)^(1/3+1/3*m)
```

Rubi [A] time = 0.03, antiderivative size = 46, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2218}

$$\frac{1}{3} f^a x^{m+1} \left(-\frac{b \log(f)}{x^3}\right)^{\frac{m+1}{3}} \text{Gamma}\left(\frac{1}{3}(-m-1), -\frac{b \log(f)}{x^3}\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^3)*x^m,x]
```

```
[Out] (f^a*x^(1 + m)*Gamma[(-1 - m)/3, -((b*Log[f])/x^3)]*(-((b*Log[f])/x^3))^((1
 + m)/3))/3
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+\frac{b}{x^3}} x^m \, dx = \frac{1}{3} f^a x^{1+m} \Gamma\left(\frac{1}{3}(-1-m), -\frac{b \log(f)}{x^3}\right) \left(-\frac{b \log(f)}{x^3}\right)^{\frac{1+m}{3}}$$

Mathematica [A] time = 0.01, size = 46, normalized size = 1.00

$$\frac{1}{3} f^a x^{m+1} \left(-\frac{b \log(f)}{x^3}\right)^{\frac{m+1}{3}} \Gamma\left(\frac{1}{3}(-m-1), -\frac{b \log(f)}{x^3}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^3)*x^m,x]
```

```
[Out] (f^a*x^(1 + m)*Gamma[(-1 - m)/3, -((b*Log[f])/x^3)]*(-((b*Log[f])/x^3))^((1
 + m)/3))/3
```

fricas [F] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(f^{\frac{ax^3+b}{x^3}}x^m, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)*x^m,x, algorithm="fricas")
```

```
[Out] integral(f^((a*x^3 + b)/x^3)*x^m, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x^3}}x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)*x^m,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^3)*x^m, x)
```

maple [B] time = 0.06, size = 169, normalized size = 3.67

$$-\frac{\left(\frac{3b\,x^{m-2}(-b)^{-\frac{m}{3}-\frac{1}{3}}\left(-\frac{b\ln(f)}{x^3}\right)^{\frac{m}{3}-\frac{2}{3}}\ln(f)^{-\frac{m}{3}+\frac{2}{3}}\Gamma\left(-\frac{m}{3}+\frac{2}{3}\right)}{m+1}-\frac{3b\,x^{m-2}(-b)^{-\frac{m}{3}-\frac{1}{3}}\left(-\frac{b\ln(f)}{x^3}\right)^{\frac{m}{3}-\frac{2}{3}}\ln(f)^{-\frac{m}{3}+\frac{2}{3}}\Gamma\left(-\frac{m}{3}+\frac{2}{3},-\frac{b\ln(f)}{x^3}\right)}{m+1}-\frac{3x^{m+1}(-b)^{-\frac{m}{3}-\frac{1}{3}}\,\mathrm{l}}{m}\right.}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^3)*x^m,x)
```

```
[Out] -1/3*f^a*(-b)^(1/3*m+1/3)*ln(f)^(1/3*m+1/3)*(3/(m+1)*x^(-2+m)*(-b)^(-1/3*m-
1/3)*ln(f)^(2/3-1/3*m)*b*(-b*ln(f)/x^3)^(-2/3+1/3*m)*GAMMA(2/3-1/3*m)-3/(m+
1)*x^(m+1)*(-b)^(-1/3*m-1/3)*ln(f)^(-1/3*m-1/3)*exp(b*ln(f)/x^3)-3/(m+1)*x^
(-2+m)*(-b)^(-1/3*m-1/3)*ln(f)^(2/3-1/3*m)*b*(-b*ln(f)/x^3)^(-2/3+1/3*m)*GA
MMA(2/3-1/3*m,-b*ln(f)/x^3))
```

maxima [A] time = 1.29, size = 38, normalized size = 0.83

$$\frac{1}{3} f^{a} x^{m+1} \left(-\frac{b \log(f)}{x^3}\right)^{\frac{1}{3} m+\frac{1}{3}} \Gamma\left(-\frac{1}{3} m - \frac{1}{3}, -\frac{b \log(f)}{x^3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)*x^m,x, algorithm="maxima")
```

```
[Out] 1/3*f^a*x^(m + 1)*(-b*log(f)/x^3)^(1/3*m + 1/3)*gamma(-1/3*m - 1/3, -b*log(
f)/x^3)
```

mupad [B] time = 3.47, size = 54, normalized size = 1.17

$$\frac{f^a\, x^{m+1}\, \mathrm{e}^{\frac{b\, \ln(f)}{2\, x^3}}\, \mathrm{M}_{\frac{m}{6}+\frac{2}{3},-\frac{m}{6}-\frac{1}{6}}\left(\frac{b\, \ln(f)}{x^3}\right)\, \left(\frac{b\, \ln(f)}{x^3}\right)^{\frac{m}{6}-\frac{1}{3}}}{m+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^3)*x^m,x)
```

```
[Out] (f^a*x^(m + 1)*exp((b*log(f))/(2*x^3))*whittakerM(m/6 + 2/3, - m/6 - 1/6, (
b*log(f))/x^3)*((b*log(f))/x^3)^(m/6 - 1/3))/(m + 1)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x^3}} x^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**3)*x**m,x)
```

```
[Out] Integral(f**(a + b/x**3)*x**m, x)
```

3.155 $\int f^{a+\frac{b}{x^3}} x^{14}\, dx$

Optimal. Leaf size=24

$$-\frac{1}{3} b^5 f^a \log^5(f)\Gamma\left(-5,-\frac{b\log(f)}{x^3}\right)$$

```
[Out] 1/3*f^a*x^15*Ei(6,-b*ln(f)/x^3)
```

Rubi [A] time = 0.03, antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2218}

$$-\frac{1}{3} b^5 f^a \log^5(f)\text{Gamma}\left(-5,-\frac{b\log(f)}{x^3}\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^3)*x^14,x]
```

```
[Out] -(b^5*f^a*Gamma[-5, -((b*Log[f])/x^3)]*Log[f]^5)/3
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+\frac{b}{x^3}} x^{14}\, dx = -\frac{1}{3} b^5 f^a \Gamma\left(-5,-\frac{b\log(f)}{x^3}\right)\log^5(f)$$

Mathematica [A] time = 0.00, size = 24, normalized size = 1.00

$$-\frac{1}{3} b^5 f^a \log^5(f)\Gamma\left(-5,-\frac{b\log(f)}{x^3}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^3)*x^14,x]
```

```
[Out] -1/3*(b^5*f^a*Gamma[-5, -((b*Log[f])/x^3)]*Log[f]^5)
```

fricas [B] time = 0.44, size = 84, normalized size = 3.50

$$-\frac{1}{360}\,b^5 f^a \mathrm{Ei}\left(\frac{b\log(f)}{x^3}\right)\log(f)^5+\frac{1}{360}\left(24\,x^{15}+6\,bx^{12}\log(f)+2\,b^2x^9\log(f)^2+b^3x^6\log(f)^3+b^4x^3\log(f)^4\right)f$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)*x^14,x, algorithm="fricas")
```

```
[Out] -1/360*b^5*f^a*Ei(b*log(f)/x^3)*log(f)^5 + 1/360*(24*x^15 + 6*b*x^12*log(f)
 + 2*b^2*x^9*log(f)^2 + b^3*x^6*log(f)^3 + b^4*x^3*log(f)^4)*f^((a*x^3 + b)
/x^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x^3}}x^{14}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)*x^14,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^3)*x^14, x)
```

maple [B] time = 0.09, size = 249, normalized size = 10.38

$$\left(\frac{\left(\frac{36b\ln(f)}{x^3}+\frac{12b^2\ln(f)^2}{x^6}+\frac{6b^3\ln(f)^3}{x^9}+\frac{6b^4\ln(f)^4}{x^{12}}+144\right)x^{15}\mathrm{e}^{\frac{b\ln(f)}{x^3}}}{720b^5\ln(f)^5}-\frac{\left(\frac{1800b\ln(f)}{x^3}+\frac{1200b^2\ln(f)^2}{x^6}+\frac{600b^3\ln(f)^3}{x^9}+\frac{300b^4\ln(f)^4}{x^{12}}+\frac{137b^5\ln(f)^5}{x^{15}}+1440\right)x^{15}}{7200b^5\ln(f)^5}+\frac{}{5b^5}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^3)*x^14,x)
```

```
[Out] 1/3*f^a*b^5*ln(f)^5*(-1/7200/b^5*x^15/ln(f)^5*(137*b^5/x^15*ln(f)^5+300*b^4
/x^12*ln(f)^4+600*b^3/x^9*ln(f)^3+1200*b^2/x^6*ln(f)^2+1800*b/x^3*ln(f)+144
0)+1/720/b^5*x^15/ln(f)^5*(6*b^4/x^12*ln(f)^4+6*b^3/x^9*ln(f)^3+12*b^2/x^6*
ln(f)^2+36*b/x^3*ln(f)+144)*exp(b/x^3*ln(f))+1/120*ln(-b/x^3*ln(f))+1/120*E
i(1,-b/x^3*ln(f))+137/7200+1/40*ln(x)-1/120*ln(-b)-1/120*ln(ln(f))+1/5*x^15
/b^5/ln(f)^5+1/4*x^12/b^4/ln(f)^4+1/6*x^9/b^3/ln(f)^3+1/12*x^6/b^2/ln(f)^2+
1/24*x^3/b/ln(f))
```

maxima [B] time = 1.63, size = 22, normalized size = 0.92

$$-\frac{1}{3}\,b^5 f^a \Gamma\left(-5,-\frac{b\log(f)}{x^3}\right)\log(f)^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)*x^14,x, algorithm="maxima")
```

```
[Out] -1/3*b^5*f^a*gamma(-5, -b*log(f)/x^3)*log(f)^5
```

mupad [B] time = 3.83, size = 102, normalized size = 4.25

$$\frac{b^5 f^a \ln(f)^5 \operatorname{expint}\left(-\frac{b \ln(f)}{x^3}\right)}{360}+\frac{b^5 f^a f^{\frac{b}{x^3}} \ln(f)^5 \left(\frac{x^3}{120\, b\, \ln(f)}+\frac{x^6}{120\, b^2 \ln(f)^2}+\frac{x^9}{60\, b^3 \ln(f)^3}+\frac{x^{12}}{20\, b^4 \ln(f)^4}+\frac{x^{15}}{5\, b^5 \ln(f)^5}\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^3)*x^14,x)
```

```
[Out] (b^5*f^a*log(f)^5*expint(-(b*log(f))/x^3))/360 + (b^5*f^a*f^(b/x^3)*log(f)^
5*(x^3/(120*b*log(f)) + x^6/(120*b^2*log(f)^2) + x^9/(60*b^3*log(f)^3) + x^
12/(20*b^4*log(f)^4) + x^15/(5*b^5*log(f)^5)))/3
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**3)*x**14,x)
```

```
[Out] Timed out
```

3.156 $\int f^{a+\frac{b}{x^3}} x^{11}\, dx$

Optimal. Leaf size=24

$$\frac{1}{3} b^4 f^a \log^4(f) \Gamma\left(-4,-\frac{b \log(f)}{x^3}\right)$$

```
[Out] 1/3*f^a*x^12*Ei(5,-b*ln(f)/x^3)
```

Rubi [A] time = 0.03, antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2218}

$$\frac{1}{3} b^4 f^a \log^4(f) \text{Gamma}\left(-4,-\frac{b \log(f)}{x^3}\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^3)*x^11,x]
```

```
[Out] (b^4*f^a*Gamma[-4, -((b*Log[f])/x^3)]*Log[f]^4)/3
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+\frac{b}{x^3}} x^{11}\, dx = \frac{1}{3} b^4 f^a \Gamma\left(-4,-\frac{b \log(f)}{x^3}\right) \log^4(f)$$

Mathematica [A] time = 0.00, size = 24, normalized size = 1.00

$$\frac{1}{3} b^4 f^a \log^4(f) \Gamma\left(-4,-\frac{b \log(f)}{x^3}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^3)*x^11,x]
```

[Out] (b^4*f^a*Gamma[-4, -((b*Log[f])/x^3)]*Log[f]^4)/3

fricas [B] time = 0.43, size = 72, normalized size = 3.00

$$-\frac{1}{72}\,b^{4}f^{a}\mathrm{Ei}\left(\frac{b\log(f)}{x^{3}}\right)\log(f)^{4}+\frac{1}{72}\left(6\,x^{12}+2\,bx^{9}\log(f)+b^{2}x^{6}\log(f)^{2}+b^{3}x^{3}\log(f)^{3}\right)f^{\frac{ax^{3}+b}{x^{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f^(a+b/x^3)*x^11,x, algorithm="fricas")

[Out] -1/72*b^4*f^a*Ei(b*log(f)/x^3)*log(f)^4 + 1/72*(6*x^12 + 2*b*x^9*log(f) + b^2*x^6*log(f)^2 + b^3*x^3*log(f)^3)*f^((a*x^3 + b)/x^3)

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x^{3}}}x^{11}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f^(a+b/x^3)*x^11,x, algorithm="giac")

[Out] integrate(f^(a + b/x^3)*x^11, x)

maple [B] time = 0.08, size = 213, normalized size = 8.88

$$-\frac{\left(-\frac{\left(\frac{10b\ln(f)}{x^{3}}+\frac{5b^{2}\ln(f)^{2}}{x^{6}}+\frac{5b^{3}\ln(f)^{3}}{x^{9}}+30\right)x^{12}\mathrm{e}^{\frac{b\ln(f)}{x^{3}}}}{120b^{4}\ln(f)^{4}}+\frac{\left(\frac{480b\ln(f)}{x^{3}}+\frac{360b^{2}\ln(f)^{2}}{x^{6}}+\frac{240b^{3}\ln(f)^{3}}{x^{9}}+\frac{125b^{4}\ln(f)^{4}}{x^{12}}+360\right)x^{12}}{1440b^{4}\ln(f)^{4}}-\frac{x^{12}}{4b^{4}\ln(f)^{4}}-\frac{x^{9}}{3b^{3}\ln(f)^{3}}-\frac{}{4b}\cdots}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(f^(a+b/x^3)*x^11,x)

[Out] -1/3*f^a*b^4*ln(f)^4*(1/1440/b^4*x^12/ln(f)^4*(125*b^4/x^12*ln(f)^4+240*b^3/x^9*ln(f)^3+360*b^2/x^6*ln(f)^2+480*b/x^3*ln(f)+360)-1/120/b^4*x^12/ln(f)^4*(5*b^3/x^9*ln(f)^3+5*b^2/x^6*ln(f)^2+10*b/x^3*ln(f)+30)*exp(b/x^3*ln(f))-1/24*ln(-b/x^3*ln(f))-1/24*Ei(1,-b/x^3*ln(f))-25/288-1/8*ln(x)+1/24*ln(-b)+1/24*ln(ln(f))-1/4/b^4*x^12/ln(f)^4-1/3/b^3*x^9/ln(f)^3-1/4/b^2*x^6/ln(f)^2-1/6/b*x^3/ln(f))

maxima [B] time = 1.29, size = 22, normalized size = 0.92

$$\frac{1}{3}\,b^{4}f^{a}\Gamma\left(-4,-\frac{b\log(f)}{x^{3}}\right)\log(f)^{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)*x^11,x, algorithm="maxima")
```

```
[Out] 1/3*b^4*f^a*gamma(-4, -b*log(f)/x^3)*log(f)^4
```

mupad [B] time = 3.78, size = 90, normalized size = 3.75

$$\frac{b^4\,f^a\,\ln(f)^4\,\mathrm{expint}\left(-\frac{b\,\ln(f)}{x^3}\right)}{72}+\frac{b^4\,f^a\,f^{\frac{b}{x^3}}\,\ln(f)^4\,\left(\frac{x^3}{24\,b\,\ln(f)}+\frac{x^6}{24\,b^2\,\ln(f)^2}+\frac{x^9}{12\,b^3\,\ln(f)^3}+\frac{x^{12}}{4\,b^4\,\ln(f)^4}\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^3)*x^11,x)
```

```
[Out] (b^4*f^a*log(f)^4*expint(-(b*log(f))/x^3))/72 + (b^4*f^a*f^(b/x^3)*log(f)^4
*(x^3/(24*b*log(f)) + x^6/(24*b^2*log(f)^2) + x^9/(12*b^3*log(f)^3) + x^12/
(4*b^4*log(f)^4)))/3
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x^3}}x^{11}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**3)*x**11,x)
```

```
[Out] Integral(f**(a + b/x**3)*x**11, x)
```

3.157 $\int f^{a+\frac{b}{x^3}} x^8 \, dx$

Optimal. Leaf size=81

$$-\frac{1}{18} b^3 f^a \log^3(f) \text{Ei}\left(\frac{b \log(f)}{x^3}\right)+\frac{1}{18} b^2 x^3 \log^2(f) f^{a+\frac{b}{x^3}}+\frac{1}{9} x^9 f^{a+\frac{b}{x^3}}+\frac{1}{18} b x^6 \log(f) f^{a+\frac{b}{x^3}}$$

```
[Out] 1/9*f^(a+b/x^3)*x^9+1/18*b*f^(a+b/x^3)*x^6*ln(f)+1/18*b^2*f^(a+b/x^3)*x^3*l
n(f)^2-1/18*b^3*f^a*Ei(b*ln(f)/x^3)*ln(f)^3
```

Rubi [A] time = 0.11, antiderivative size = 81, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2214, 2210}

$$-\frac{1}{18} b^3 f^a \log^3(f) \text{Ei}\left(\frac{b \log(f)}{x^3}\right)+\frac{1}{18} b^2 x^3 \log^2(f) f^{a+\frac{b}{x^3}}+\frac{1}{9} x^9 f^{a+\frac{b}{x^3}}+\frac{1}{18} b x^6 \log(f) f^{a+\frac{b}{x^3}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^3)*x^8,x]
```

```
[Out] (f^(a + b/x^3)*x^9)/9 + (b*f^(a + b/x^3)*x^6*Log[f])/18 + (b^2*f^(a + b/x^3
)*x^3*Log[f]^2)/18 - (b^3*f^a*ExpIntegralEi[(b*Log[f])/x^3]*Log[f]^3)/18
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\begin{aligned}\int f^{a+\frac{b}{x^3}}x^8\,dx &= \frac{1}{9}f^{a+\frac{b}{x^3}}x^9+\frac{1}{3}(b\log(f))\int f^{a+\frac{b}{x^3}}x^5\,dx\\ &= \frac{1}{9}f^{a+\frac{b}{x^3}}x^9+\frac{1}{18}bf^{a+\frac{b}{x^3}}x^6\log(f)+\frac{1}{6}\left(b^2\log^2(f)\right)\int f^{a+\frac{b}{x^3}}x^2\,dx\\ &= \frac{1}{9}f^{a+\frac{b}{x^3}}x^9+\frac{1}{18}bf^{a+\frac{b}{x^3}}x^6\log(f)+\frac{1}{18}b^2f^{a+\frac{b}{x^3}}x^3\log^2(f)+\frac{1}{6}\left(b^3\log^3(f)\right)\int\frac{f^{a+\frac{b}{x^3}}}{x}\,dx\\ &= \frac{1}{9}f^{a+\frac{b}{x^3}}x^9+\frac{1}{18}bf^{a+\frac{b}{x^3}}x^6\log(f)+\frac{1}{18}b^2f^{a+\frac{b}{x^3}}x^3\log^2(f)-\frac{1}{18}b^3f^a\text{Ei}\left(\frac{b\log(f)}{x^3}\right)\log^3(f)\end{aligned}$$

Mathematica [A] time = 0.02, size = 57, normalized size = 0.70

$$\frac{1}{18}f^a\left(x^3f^{\frac{b}{x^3}}\left(b^2\log^2(f)+bx^3\log(f)+2x^6\right)-b^3\log^3(f)\text{Ei}\left(\frac{b\log(f)}{x^3}\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^3)*x^8,x]
```

```
[Out] (f^a*(-(b^3*ExpIntegralEi[(b*Log[f])/x^3]*Log[f]^3) + f^(b/x^3)*x^3*(2*x^6
+ b*x^3*Log[f] + b^2*Log[f]^2)))/18
```

fricas [A] time = 0.45, size = 60, normalized size = 0.74

$$-\frac{1}{18}\,b^3f^a\text{Ei}\left(\frac{b\log(f)}{x^3}\right)\log(f)^3+\frac{1}{18}\left(2\,x^9+bx^6\log(f)+b^2x^3\log(f)^2\right)f^{\frac{ax^3+b}{x^3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)*x^8,x, algorithm="fricas")
```

```
[Out] -1/18*b^3*f^a*Ei(b*log(f)/x^3)*log(f)^3 + 1/18*(2*x^9 + b*x^6*log(f) + b^2*
x^3*log(f)^2)*f^((a*x^3 + b)/x^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x^3}}x^8\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)*x^8,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^3)*x^8, x)
```

maple [B] time = 0.07, size = 177, normalized size = 2.19

$$\frac{\left(\frac{\left(\frac{4b\ln(f)}{x^3}+\frac{4b^2\ln(f)^2}{x^6}+8\right)x^9\mathrm{e}^{\frac{b\ln(f)}{x^3}}}{24b^3\ln(f)^3}-\frac{\left(\frac{36b\ln(f)}{x^3}+\frac{36b^2\ln(f)^2}{x^6}+\frac{22b^3\ln(f)^3}{x^9}+24\right)x^9}{72b^3\ln(f)^3}+\frac{x^9}{3b^3\ln(f)^3}+\frac{x^6}{2b^2\ln(f)^2}+\frac{x^3}{2b\ln(f)}+\frac{\mathrm{Ei}\left(1,-\frac{b\ln(f)}{x^3}\right)}{6}+\frac{\ln(x)}{2}-\right.}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^3)*x^8,x)
```

```
[Out] 1/3*f^a*b^3*ln(f)^3*(-1/72/b^3*x^9/ln(f)^3*(22*b^3/x^9*ln(f)^3+36*b^2/x^6*l
n(f)^2+36*b/x^3*ln(f)+24)+1/24/b^3*x^9/ln(f)^3*(4*b^2/x^6*ln(f)^2+4*b/x^3*l
n(f)+8)*exp(b/x^3*ln(f))+1/6*ln(-b/x^3*ln(f))+1/6*Ei(1,-b/x^3*ln(f))+11/36+
1/2*ln(x)-1/6*ln(-b)-1/6*ln(ln(f))+1/3/b^3*x^9/ln(f)^3+1/2/b^2*x^6/ln(f)^2+
1/2/b*x^3/ln(f))
```

maxima [A] time = 1.27, size = 22, normalized size = 0.27

$$-\frac{1}{3}b^3f^a\Gamma\left(-3,-\frac{b\log(f)}{x^3}\right)\log(f)^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)*x^8,x, algorithm="maxima")
```

```
[Out] -1/3*b^3*f^a*gamma(-3, -b*log(f)/x^3)*log(f)^3
```

mupad [B] time = 3.70, size = 69, normalized size = 0.85

$$\frac{b^3\,f^a\,{\ln(f)}^3\,\left(f^{\frac{b}{x^3}}\,\left(\frac{x^3}{6\,b\,\ln(f)}+\frac{x^6}{6\,b^2\,{\ln(f)}^2}+\frac{x^9}{3\,b^3\,{\ln(f)}^3}\right)+\frac{\mathrm{expint}\left(-\frac{b\,\ln(f)}{x^3}\right)}{6}\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^3)*x^8,x)
```

```
[Out] (b^3*f^a*log(f)^3*(f^(b/x^3)*(x^3/(6*b*log(f)) + x^6/(6*b^2*log(f)^2) + x^9
/(3*b^3*log(f)^3)) + expint(-(b*log(f))/x^3)/6))/3
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x^3}}x^8\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**3)*x**8,x)
```

```
[Out] Integral(f**(a + b/x**3)*x**8, x)
```

3.158 $\int f^{a+\frac{b}{x^3}} x^5 \, dx$

Optimal. Leaf size=58

$$-\frac{1}{6}b^2 f^a \log^2(f)\text{Ei}\left(\frac{b\log(f)}{x^3}\right)+\frac{1}{6}bx^3\log(f)f^{a+\frac{b}{x^3}}+\frac{1}{6}x^6 f^{a+\frac{b}{x^3}}$$

```
[Out] 1/6*f^(a+b/x^3)*x^6+1/6*b*f^(a+b/x^3)*x^3*ln(f)-1/6*b^2*f^a*Ei(b*ln(f)/x^3)
*ln(f)^2
```

Rubi [A] time = 0.08, antiderivative size = 58, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2214, 2210}

$$-\frac{1}{6}b^2 f^a \log^2(f)\text{Ei}\left(\frac{b\log(f)}{x^3}\right)+\frac{1}{6}x^6 f^{a+\frac{b}{x^3}}+\frac{1}{6}bx^3\log(f)f^{a+\frac{b}{x^3}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^3)*x^5,x]
```

```
[Out] (f^(a + b/x^3)*x^6)/6 + (b*f^(a + b/x^3)*x^3*Log[f])/6 - (b^2*f^a*ExpIntegr
alEi[(b*Log[f])/x^3]*Log[f]^2)/6
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\int f^{a+\frac{b}{x^3}}x^5\,dx = \frac{1}{6}f^{a+\frac{b}{x^3}}x^6 + \frac{1}{2}(b\log(f))\int f^{a+\frac{b}{x^3}}x^2\,dx$$
$$= \frac{1}{6}f^{a+\frac{b}{x^3}}x^6 + \frac{1}{6}bf^{a+\frac{b}{x^3}}x^3\log(f) + \frac{1}{2}\left(b^2\log^2(f)\right)\int \frac{f^{a+\frac{b}{x^3}}}{x}\,dx$$
$$= \frac{1}{6}f^{a+\frac{b}{x^3}}x^6 + \frac{1}{6}bf^{a+\frac{b}{x^3}}x^3\log(f) - \frac{1}{6}b^2f^a\text{Ei}\left(\frac{b\log(f)}{x^3}\right)\log^2(f)$$

Mathematica [A] time = 0.02, size = 44, normalized size = 0.76

$$\frac{1}{6}f^a\left(x^3f^{\frac{b}{x^3}}\left(b\log(f)+x^3\right)-b^2\log^2(f)\text{Ei}\left(\frac{b\log(f)}{x^3}\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^3)*x^5,x]
```

```
[Out] (f^a*(-(b^2*ExpIntegralEi[(b*Log[f])/x^3]*Log[f]^2) + f^(b/x^3)*x^3*(x^3 +
b*Log[f])))/6
```

fricas [A] time = 0.46, size = 47, normalized size = 0.81

$$-\frac{1}{6}b^2f^a\text{Ei}\left(\frac{b\log(f)}{x^3}\right)\log(f)^2+\frac{1}{6}\left(x^6+bx^3\log(f)\right)f^{\frac{ax^3+b}{x^3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)*x^5,x, algorithm="fricas")
```

```
[Out] -1/6*b^2*f^a*Ei(b*log(f)/x^3)*log(f)^2 + 1/6*(x^6 + b*x^3*log(f))*f^((a*x^3
 + b)/x^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x^3}}x^5\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)*x^5,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^3)*x^5, x)
```

maple [B] time = 0.07, size = 141, normalized size = 2.43

$$-\frac{\left(-\frac{\left(\frac{3b\ln(f)}{x^3}+3\right)x^6\mathrm{e}^{\frac{b\ln(f)}{x^3}}}{6b^2\ln(f)^2}+\frac{\left(\frac{12b\ln(f)}{x^3}+\frac{9b^2\ln(f)^2}{x^6}+6\right)x^6}{12b^2\ln(f)^2}-\frac{x^6}{2b^2\ln(f)^2}-\frac{x^3}{b\ln(f)}-\frac{\mathrm{Ei}\left(1,-\frac{b\ln(f)}{x^3}\right)}{2}-\frac{3\ln(x)}{2}+\frac{\ln(-b)}{2}-\frac{\ln\left(-\frac{b\ln(f)}{x^3}\right)}{2}+\frac{\ln(\ln(f
}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^3)*x^5,x)
```

```
[Out] -1/3*f^a*b^2*ln(f)^2*(1/12/b^2*x^6/ln(f)^2*(9*b^2/x^6*ln(f)^2+12*b/x^3*ln(f
)+6)-1/6/b^2*x^6/ln(f)^2*(3+3*b/x^3*ln(f))*exp(b/x^3*ln(f))-1/2*ln(-b/x^3*l
n(f))-1/2*Ei(1,-b/x^3*ln(f))-3/4-3/2*ln(x)+1/2*ln(-b)+1/2*ln(ln(f))-1/2/b^2
*x^6/ln(f)^2-1/b*x^3/ln(f))
```

maxima [A] time = 1.35, size = 22, normalized size = 0.38

$$\frac{1}{3}\,b^2f^a\Gamma\left(-2,-\frac{b\log(f)}{x^3}\right)\log(f)^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)*x^5,x, algorithm="maxima")
```

```
[Out] 1/3*b^2*f^a*gamma(-2, -b*log(f)/x^3)*log(f)^2
```

mupad [B] time = 3.65, size = 57, normalized size = 0.98

$$\frac{b^2\,f^a\,\ln(f)^2\,\left(f^{\frac{b}{x^3}}\,\left(\frac{x^3}{2\,b\,\ln(f)}+\frac{x^6}{2\,b^2\,\ln(f)^2}\right)+\frac{\mathrm{expint}\left(-\frac{b\,\ln(f)}{x^3}\right)}{2}\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^3)*x^5,x)
```

```
[Out] (b^2*f^a*log(f)^2*(f^(b/x^3)*(x^3/(2*b*log(f)) + x^6/(2*b^2*log(f)^2)) + ex
pint(-(b*log(f))/x^3)/2))/3
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x^3}}x^5\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**3)*x**5,x)
```

```
[Out] Integral(f**(a + b/x**3)*x**5, x)
```

3.159 $\int f^{a+\frac{b}{x^3}} x^2 \, dx$

Optimal. Leaf size=35

$$\frac{1}{3}x^3 f^{a+\frac{b}{x^3}} - \frac{1}{3} b f^a \log(f) \text{Ei}\left(\frac{b\log(f)}{x^3}\right)$$

```
[Out] 1/3*f^(a+b/x^3)*x^3-1/3*b*f^a*Ei(b*ln(f)/x^3)*ln(f)
```

Rubi [A] time = 0.05, antiderivative size = 35, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2214, 2210}

$$\frac{1}{3}x^3 f^{a+\frac{b}{x^3}} - \frac{1}{3} b f^a \log(f) \text{Ei}\left(\frac{b\log(f)}{x^3}\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^3)*x^2,x]
```

```
[Out] (f^(a + b/x^3)*x^3)/3 - (b*f^a*ExpIntegralEi[(b*Log[f])/x^3]*Log[f])/3
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\begin{aligned}\int f^{a+\frac{b}{x^3}} x^2 \, dx &= \frac{1}{3} f^{a+\frac{b}{x^3}} x^3 + (b\log(f)) \int \frac{f^{a+\frac{b}{x^3}}}{x} \, dx \\ &= \frac{1}{3} f^{a+\frac{b}{x^3}} x^3 - \frac{1}{3} b f^a \text{Ei}\left(\frac{b\log(f)}{x^3}\right) \log(f)\end{aligned}$$

Mathematica [A] time = 0.01, size = 32, normalized size = 0.91

$$\frac{1}{3}f^a\left(x^3f^{\frac{b}{x^3}}-b\log(f)\text{Ei}\left(\frac{b\log(f)}{x^3}\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^3)*x^2,x]
```

```
[Out] (f^a*(f^(b/x^3)*x^3 - b*ExpIntegralEi[(b*Log[f])/x^3]*Log[f]))/3
```

fricas [A] time = 0.45, size = 35, normalized size = 1.00

$$\frac{1}{3}f^{\frac{ax^3+b}{x^3}}x^3-\frac{1}{3}bf^a\text{Ei}\left(\frac{b\log(f)}{x^3}\right)\log(f)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)*x^2,x, algorithm="fricas")
```

```
[Out] 1/3*f^((a*x^3 + b)/x^3)*x^3 - 1/3*b*f^a*Ei(b*log(f)/x^3)*log(f)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x^3}}x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)*x^2,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^3)*x^2, x)
```

maple [B] time = 0.06, size = 97, normalized size = 2.77

$$\frac{\left(\frac{x^3\mathrm{e}^{\frac{b\ln(f)}{x^3}}}{b\ln(f)}-\frac{\left(\frac{2b\ln(f)}{x^3}+2\right)x^3}{2b\ln(f)}+\frac{x^3}{b\ln(f)}+\text{Ei}\left(1,-\frac{b\ln(f)}{x^3}\right)+3\ln(x)-\ln(-b)+\ln\left(-\frac{b\ln(f)}{x^3}\right)-\ln\left(\ln(f)\right)+1\right)bf^a\ln(f)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^3)*x^2,x)
```

```
[Out] 1/3*f^a*b*ln(f)*(-1/2/b*x^3/ln(f)*(2+2*b/x^3*ln(f))+1/b*x^3/ln(f)*exp(b/x^3
*ln(f))+ln(-b/x^3*ln(f))+Ei(1,-b/x^3*ln(f))+1+3*ln(x)-ln(-b)-ln(ln(f))+1/b*
x^3/ln(f))
```

maxima [A] time = 1.25, size = 18, normalized size = 0.51

$$-\frac{1}{3}\,bf^{a}\Gamma\left(-1,-\frac{b\log(f)}{x^{3}}\right)\log(f)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)*x^2,x, algorithm="maxima")
```

```
[Out] -1/3*b*f^a*gamma(-1, -b*log(f)/x^3)*log(f)
```

mupad [B] time = 3.67, size = 33, normalized size = 0.94

$$\frac{f^{a}\,f^{\frac{b}{x^{3}}}\,x^{3}}{3}+\frac{b\,f^{a}\,\ln(f)\,\mathrm{expint}\left(-\frac{b\,\ln(f)}{x^{3}}\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^3)*x^2,x)
```

```
[Out] (f^a*f^(b/x^3)*x^3)/3 + (b*f^a*log(f)*expint(-(b*log(f))/x^3))/3
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x^{3}}}x^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**3)*x**2,x)
```

```
[Out] Integral(f**(a + b/x**3)*x**2, x)
```

3.160 $\int \frac{f^{a+\frac{b}{x^3}}}{x} dx$

Optimal. Leaf size=15

$$-\frac{1}{3}f^a\text{Ei}\left(\frac{b\log(f)}{x^3}\right)$$

```
[Out] -1/3*f^a*Ei(b*ln(f)/x^3)
```

Rubi [A] time = 0.02, antiderivative size = 15, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2210}

$$-\frac{1}{3}f^a\text{Ei}\left(\frac{b\log(f)}{x^3}\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^3)/x,x]
```

```
[Out] -(f^a*ExpIntegralEi[(b*Log[f])/x^3])/3
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x^3}}}{x} dx = -\frac{1}{3}f^a\text{Ei}\left(\frac{b\log(f)}{x^3}\right)$$

Mathematica [A] time = 0.00, size = 15, normalized size = 1.00

$$-\frac{1}{3}f^a\text{Ei}\left(\frac{b\log(f)}{x^3}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^3)/x,x]
```

```
[Out] -1/3*(f^a*ExpIntegralEi[(b*Log[f])/x^3])
```

fricas [A] time = 0.43, size = 13, normalized size = 0.87

$$-\frac{1}{3} f^a \mathrm{Ei}\left(\frac{b \log(f)}{x^3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x,x, algorithm="fricas")
```

```
[Out] -1/3*f^a*Ei(b*log(f)/x^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+\frac{b}{x^3}}}{x} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^3)/x, x)
```

maple [B] time = 0.06, size = 41, normalized size = 2.73

$$-\frac{\left(-\mathrm{Ei}\left(1, -\frac{b \ln(f)}{x^3}\right) - 3\ln(x) + \ln(-b) - \ln\left(-\frac{b \ln(f)}{x^3}\right) + \ln\left(\ln(f)\right)\right) f^a}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^3)/x,x)
```

```
[Out] -1/3*f^a*(-ln(-b/x^3*ln(f))-Ei(1,-b/x^3*ln(f))-3*ln(x)+ln(-b)+ln(ln(f)))
```

maxima [A] time = 1.28, size = 13, normalized size = 0.87

$$-\frac{1}{3} f^a \mathrm{Ei}\left(\frac{b \log(f)}{x^3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x,x, algorithm="maxima")
```

```
[Out] -1/3*f^a*Ei(b*log(f)/x^3)
```

mupad [B] time = 3.59, size = 13, normalized size = 0.87

$$-\frac{f^a \operatorname{ei}\left(\frac{b \ln(f)}{x^3}\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^3)/x,x)
[Out] -(f^a*ei((b*log(f))/x^3))/3
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+\frac{b}{x^3}}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**3)/x,x)
[Out] Integral(f**(a + b/x**3)/x, x)
```

3.161 $\int \frac{f^{a+\frac{b}{x^3}}}{x^4} \, dx$

Optimal. Leaf size=20

$$-\frac{f^{a+\frac{b}{x^3}}}{3b\log(f)}$$

```
[Out] -1/3*f^(a+b/x^3)/b/ln(f)
```

Rubi [A] time = 0.02, antiderivative size = 20, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2209}

$$-\frac{f^{a+\frac{b}{x^3}}}{3b\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^3)/x^4,x]
```

```
[Out] -f^(a + b/x^3)/(3*b*Log[f])
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x^3}}}{x^4} \, dx = -\frac{f^{a+\frac{b}{x^3}}}{3b\log(f)}$$

Mathematica [A] time = 0.00, size = 20, normalized size = 1.00

$$-\frac{f^{a+\frac{b}{x^3}}}{3b\log(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^3)/x^4,x]
[Out] -1/3*f^(a + b/x^3)/(b*Log[f])
```

fricas [A] time = 0.42, size = 22, normalized size = 1.10

$$-\frac{f^{\left(\frac{ax^3+b}{x^3}\right)}}{3\,b\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^4,x, algorithm="fricas")
[Out] -1/3*f^((a*x^3 + b)/x^3)/(b*log(f))
```

giac [A] time = 0.21, size = 22, normalized size = 1.10

$$-\frac{f^{\left(\frac{ax^3+b}{x^3}\right)}}{3\,b\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^4,x, algorithm="giac")
[Out] -1/3*f^((a*x^3 + b)/x^3)/(b*log(f))
```

maple [A] time = 0.00, size = 19, normalized size = 0.95

$$-\frac{f^{a+\frac{b}{x^3}}}{3b\ln\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^3)/x^4,x)
[Out] -1/3*f^(a+b/x^3)/b/ln(f)
```

maxima [A] time = 0.93, size = 18, normalized size = 0.90

$$-\frac{f^{a+\frac{b}{x^3}}}{3\,b\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^4,x, algorithm="maxima")
```

```
[Out] -1/3*f^(a + b/x^3)/(b*log(f))
```

mupad [B] time = 3.44, size = 18, normalized size = 0.90

$$-\frac{f^{a+\frac{b}{x^3}}}{3\,b\,\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^3)/x^4,x)
```

```
[Out] -f^(a + b/x^3)/(3*b*log(f))
```

sympy [A] time = 0.12, size = 29, normalized size = 1.45

$$\begin{cases} -\frac{f^{a+\frac{b}{x^3}}}{3b\log(f)} & \text{for}\ 3b\log(f) \neq 0 \\ -\frac{1}{3x^3} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**3)/x**4,x)
```

```
[Out] Piecewise((-f**(a + b/x**3)/(3*b*log(f)), Ne(3*b*log(f), 0)), (-1/(3*x**3),
 True))
```

3.162 $\int \frac{f^{a+\frac{b}{x^3}}}{x^7} dx$

Optimal. Leaf size=44

$$\frac{f^{a+\frac{b}{x^3}}}{3b^2\log^2(f)} - \frac{f^{a+\frac{b}{x^3}}}{3bx^3\log(f)}$$

```
[Out] 1/3*f^(a+b/x^3)/b^2/ln(f)^2-1/3*f^(a+b/x^3)/b/x^3/ln(f)
```

Rubi [A] time = 0.05, antiderivative size = 44, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2212, 2209}

$$\frac{f^{a+\frac{b}{x^3}}}{3b^2\log^2(f)} - \frac{f^{a+\frac{b}{x^3}}}{3bx^3\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^3)/x^7,x]
```

```
[Out] f^(a + b/x^3)/(3*b^2*Log[f]^2) - f^(a + b/x^3)/(3*b*x^3*Log[f])
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x^3}}}{x^7}\,dx = -\frac{f^{a+\frac{b}{x^3}}}{3bx^3\log(f)} - \frac{\int \frac{f^{a+\frac{b}{x^3}}}{x^4}\,dx}{b\log(f)}$$
$$= \frac{f^{a+\frac{b}{x^3}}}{3b^2\log^2(f)} - \frac{f^{a+\frac{b}{x^3}}}{3bx^3\log(f)}$$

Mathematica [A] time = 0.01, size = 32, normalized size = 0.73

$$\frac{f^{a+\frac{b}{x^3}}\left(x^3-b\log(f)\right)}{3b^2x^3\log^2(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^3)/x^7,x]
[Out] (f^(a + b/x^3)*(x^3 - b*Log[f]))/(3*b^2*x^3*Log[f]^2)
```

fricas [A] time = 0.42, size = 34, normalized size = 0.77

$$\frac{\left(x^3-b\log(f)\right)f^{\frac{ax^3+b}{x^3}}}{3\,b^2x^3\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^7,x, algorithm="fricas")
[Out] 1/3*(x^3 - b*log(f))*f^((a*x^3 + b)/x^3)/(b^2*x^3*log(f)^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+\frac{b}{x^3}}}{x^7}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^7,x, algorithm="giac")
[Out] integrate(f^(a + b/x^3)/x^7, x)
```

maple [A] time = 0.03, size = 52, normalized size = 1.18

$$\frac{\frac{x^{6}\mathrm{e}^{\left(a+\frac{b}{x^{3}}\right)\ln(f)}}{3b^{2}\ln(f)^{2}}-\frac{x^{3}\mathrm{e}^{\left(a+\frac{b}{x^{3}}\right)\ln(f)}}{3b\ln(f)}}{x^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^3)/x^7,x)
```

```
[Out] (1/3/b^2/ln(f)^2*x^6*exp((a+b/x^3)*ln(f))-1/3/b/ln(f)*x^3*exp((a+b/x^3)*ln(
f)))/x^6
```

maxima [C] time = 1.29, size = 22, normalized size = 0.50

$$\frac{f^{a}\Gamma\left(2,-\frac{b\log(f)}{x^{3}}\right)}{3\,b^{2}\log(f)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^7,x, algorithm="maxima")
```

```
[Out] 1/3*f^a*gamma(2, -b*log(f)/x^3)/(b^2*log(f)^2)
```

mupad [B] time = 3.49, size = 36, normalized size = 0.82

$$-\frac{f^{a+\frac{b}{x^{3}}}\left(\frac{1}{3\,b\,\ln(f)}-\frac{x^{3}}{3\,b^{2}\ln(f)^{2}}\right)}{x^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^3)/x^7,x)
```

```
[Out] -(f^(a + b/x^3)*(1/(3*b*log(f)) - x^3/(3*b^2*log(f)^2)))/x^3
```

sympy [A] time = 0.13, size = 29, normalized size = 0.66

$$\frac{f^{a+\frac{b}{x^{3}}}\left(-b\log\left(f\right)+x^{3}\right)}{3b^{2}x^{3}\log\left(f\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**3)/x**7,x)
```

```
[Out] f**(a + b/x**3)*(-b*log(f) + x**3)/(3*b**2*x**3*log(f)**2)
```

3.163 $\int \frac{f^{a+\frac{b}{x^3}}}{x^{10}}\,dx$

Optimal. Leaf size=67

$$-\frac{2f^{a+\frac{b}{x^3}}}{3b^3\log^3(f)}+\frac{2f^{a+\frac{b}{x^3}}}{3b^2x^3\log^2(f)}-\frac{f^{a+\frac{b}{x^3}}}{3bx^6\log(f)}$$

```
[Out] -2/3*f^(a+b/x^3)/b^3/ln(f)^3+2/3*f^(a+b/x^3)/b^2/x^3/ln(f)^2-1/3*f^(a+b/x^3
)/b/x^6/ln(f)
```

Rubi [A] time = 0.07, antiderivative size = 67, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2212, 2209}

$$\frac{2f^{a+\frac{b}{x^3}}}{3b^2x^3\log^2(f)}-\frac{2f^{a+\frac{b}{x^3}}}{3b^3\log^3(f)}-\frac{f^{a+\frac{b}{x^3}}}{3bx^6\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^3)/x^10,x]
```

```
[Out] (-2*f^(a + b/x^3))/(3*b^3*Log[f]^3) + (2*f^(a + b/x^3))/(3*b^2*x^3*Log[f]^2
) - f^(a + b/x^3)/(3*b*x^6*Log[f])
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x^3}}}{x^{10}}\,dx = -\frac{f^{a+\frac{b}{x^3}}}{3bx^6\log(f)} - \frac{2\int \frac{f^{a+\frac{b}{x^3}}}{x^7}\,dx}{b\log(f)}$$
$$= \frac{2f^{a+\frac{b}{x^3}}}{3b^2x^3\log^2(f)} - \frac{f^{a+\frac{b}{x^3}}}{3bx^6\log(f)} + \frac{2\int \frac{f^{a+\frac{b}{x^3}}}{x^4}\,dx}{b^2\log^2(f)}$$
$$= -\frac{2f^{a+\frac{b}{x^3}}}{3b^3\log^3(f)} + \frac{2f^{a+\frac{b}{x^3}}}{3b^2x^3\log^2(f)} - \frac{f^{a+\frac{b}{x^3}}}{3bx^6\log(f)}$$

Mathematica [A] time = 0.01, size = 45, normalized size = 0.67

$$-\frac{f^{a+\frac{b}{x^3}}\left(b^2\log^2(f) - 2bx^3\log(f) + 2x^6\right)}{3b^3x^6\log^3(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^3)/x^10,x]
```

```
[Out] -1/3*(f^(a + b/x^3)*(2*x^6 - 2*b*x^3*Log[f] + b^2*Log[f]^2))/(b^3*x^6*Log[f
]^3)
```

fricas [A] time = 0.41, size = 47, normalized size = 0.70

$$-\frac{\left(2\,x^6 - 2\,bx^3\log(f) + b^2\log(f)^2\right)f^{\frac{ax^3+b}{x^3}}}{3\,b^3x^6\log(f)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^10,x, algorithm="fricas")
```

```
[Out] -1/3*(2*x^6 - 2*b*x^3*log(f) + b^2*log(f)^2)*f^((a*x^3 + b)/x^3)/(b^3*x^6*l
og(f)^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+\frac{b}{x^3}}}{x^{10}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^10,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^3)/x^10, x)
```

maple [A] time = 0.03, size = 75, normalized size = 1.12

$$\frac{-\frac{2x^9 e^{\left(a+\frac{b}{x^3}\right)\ln(f)}}{3b^3\ln(f)^3}+\frac{2x^6 e^{\left(a+\frac{b}{x^3}\right)\ln(f)}}{3b^2\ln(f)^2}-\frac{x^3 e^{\left(a+\frac{b}{x^3}\right)\ln(f)}}{3b\ln(f)}}{x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^3)/x^10,x)
```

```
[Out] (-2/3/b^3/ln(f)^3*x^9*exp((a+b/x^3)*ln(f))+2/3/b^2*x^6*exp((a+b/x^3)*ln(f))
/ln(f)^2-1/3/b*x^3*exp((a+b/x^3)*ln(f))/ln(f))/x^9
```

maxima [C] time = 1.31, size = 22, normalized size = 0.33

$$-\frac{f^a\Gamma\left(3,-\frac{b\log(f)}{x^3}\right)}{3\,b^3\log(f)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^10,x, algorithm="maxima")
```

```
[Out] -1/3*f^a*gamma(3, -b*log(f)/x^3)/(b^3*log(f)^3)
```

mupad [B] time = 3.54, size = 48, normalized size = 0.72

$$-\frac{f^{a+\frac{b}{x^3}}\left(\frac{1}{3\,b\,\ln(f)}-\frac{2\,x^3}{3\,b^2\ln(f)^2}+\frac{2\,x^6}{3\,b^3\ln(f)^3}\right)}{x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^3)/x^10,x)
```

```
[Out] -(f^(a + b/x^3)*(1/(3*b*log(f)) - (2*x^3)/(3*b^2*log(f)^2) + (2*x^6)/(3*b^3
*log(f)^3)))/x^6
```

sympy [A] time = 0.14, size = 44, normalized size = 0.66

$$\frac{f^{a+\frac{b}{x^3}}\left(-b^2\log(f)^2+2bx^3\log(f)-2x^6\right)}{3b^3x^6\log(f)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**3)/x**10,x)
```

```
[Out] f**(a + b/x**3)*(-b**2*log(f)**2 + 2*b*x**3*log(f) - 2*x**6)/(3*b**3*x**6*l
og(f)**3)
```

3.164 $\int \frac{f^{a+\frac{b}{x^3}}}{x^{13}} dx$

Optimal. Leaf size=83

$$\frac{2f^{a+\frac{b}{x^3}}}{b^4\log^4(f)} - \frac{2f^{a+\frac{b}{x^3}}}{b^3x^3\log^3(f)} + \frac{f^{a+\frac{b}{x^3}}}{b^2x^6\log^2(f)} - \frac{f^{a+\frac{b}{x^3}}}{3bx^9\log(f)}$$

```
[Out] 2*f^(a+b/x^3)/b^4/ln(f)^4-2*f^(a+b/x^3)/b^3/x^3/ln(f)^3+f^(a+b/x^3)/b^2/x^6
/ln(f)^2-1/3*f^(a+b/x^3)/b/x^9/ln(f)
```

Rubi [A] time = 0.09, antiderivative size = 83, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2212, 2209}

$$\frac{f^{a+\frac{b}{x^3}}}{b^2x^6\log^2(f)} - \frac{2f^{a+\frac{b}{x^3}}}{b^3x^3\log^3(f)} + \frac{2f^{a+\frac{b}{x^3}}}{b^4\log^4(f)} - \frac{f^{a+\frac{b}{x^3}}}{3bx^9\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^3)/x^13,x]
```

```
[Out] (2*f^(a + b/x^3))/(b^4*Log[f]^4) - (2*f^(a + b/x^3))/(b^3*x^3*Log[f]^3) + f
^(a + b/x^3)/(b^2*x^6*Log[f]^2) - f^(a + b/x^3)/(3*b*x^9*Log[f])
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x^3}}}{x^{13}}\,dx = -\frac{f^{a+\frac{b}{x^3}}}{3bx^9\log(f)} - \frac{3\int \frac{f^{a+\frac{b}{x^3}}}{x^{10}}\,dx}{b\log(f)}$$
$$= \frac{f^{a+\frac{b}{x^3}}}{b^2x^6\log^2(f)} - \frac{f^{a+\frac{b}{x^3}}}{3bx^9\log(f)} + \frac{6\int \frac{f^{a+\frac{b}{x^3}}}{x^7}\,dx}{b^2\log^2(f)}$$
$$= -\frac{2f^{a+\frac{b}{x^3}}}{b^3x^3\log^3(f)} + \frac{f^{a+\frac{b}{x^3}}}{b^2x^6\log^2(f)} - \frac{f^{a+\frac{b}{x^3}}}{3bx^9\log(f)} - \frac{6\int \frac{f^{a+\frac{b}{x^3}}}{x^4}\,dx}{b^3\log^3(f)}$$
$$= \frac{2f^{a+\frac{b}{x^3}}}{b^4\log^4(f)} - \frac{2f^{a+\frac{b}{x^3}}}{b^3x^3\log^3(f)} + \frac{f^{a+\frac{b}{x^3}}}{b^2x^6\log^2(f)} - \frac{f^{a+\frac{b}{x^3}}}{3bx^9\log(f)}$$

Mathematica [A] time = 0.01, size = 58, normalized size = 0.70

$$\frac{f^{a+\frac{b}{x^3}}\left(-b^3\log^3(f)+3b^2x^3\log^2(f)-6bx^6\log(f)+6x^9\right)}{3b^4x^9\log^4(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^3)/x^13,x]
```

```
[Out] (f^(a + b/x^3)*(6*x^9 - 6*b*x^6*Log[f] + 3*b^2*x^3*Log[f]^2 - b^3*Log[f]^3)
)/(3*b^4*x^9*Log[f]^4)
```

fricas [A] time = 0.42, size = 60, normalized size = 0.72

$$\frac{\left(6\,x^9-6\,bx^6\log(f)+3\,b^2x^3\log(f)^2-b^3\log(f)^3\right)f^{\frac{ax^3+b}{x^3}}}{3\,b^4x^9\log(f)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^13,x, algorithm="fricas")
```

```
[Out] 1/3*(6*x^9 - 6*b*x^6*log(f) + 3*b^2*x^3*log(f)^2 - b^3*log(f)^3)*f^((a*x^3
+ b)/x^3)/(b^4*x^9*log(f)^4)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+\frac{b}{x^3}}}{x^{13}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^13,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^3)/x^13, x)
```

maple [A] time = 0.04, size = 97, normalized size = 1.17

$$\frac{\frac{2x^{12}e^{\left(a+\frac{b}{x^3}\right)\ln(f)}}{b^4\ln(f)^4}-\frac{2x^9e^{\left(a+\frac{b}{x^3}\right)\ln(f)}}{b^3\ln(f)^3}+\frac{x^6e^{\left(a+\frac{b}{x^3}\right)\ln(f)}}{b^2\ln(f)^2}-\frac{x^3e^{\left(a+\frac{b}{x^3}\right)\ln(f)}}{3b\ln(f)}}{x^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^3)/x^13,x)
```

```
[Out] (1/b^2*x^6*exp((a+b/x^3)*ln(f))/ln(f)^2+2/b^4/ln(f)^4*x^12*exp((a+b/x^3)*ln
(f))-2/b^3*x^9*exp((a+b/x^3)*ln(f))/ln(f)^3-1/3/b*x^3*exp((a+b/x^3)*ln(f))/
ln(f))/x^12
```

maxima [C] time = 1.28, size = 22, normalized size = 0.27

$$\frac{f^a\Gamma\left(4,-\frac{b\log(f)}{x^3}\right)}{3\,b^4\log(f)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^13,x, algorithm="maxima")
```

```
[Out] 1/3*f^a*gamma(4, -b*log(f)/x^3)/(b^4*log(f)^4)
```

mupad [B] time = 3.54, size = 60, normalized size = 0.72

$$-\frac{f^{a+\frac{b}{x^3}}\left(\frac{1}{3\,b\,\ln(f)}-\frac{x^3}{b^2\ln(f)^2}+\frac{2\,x^6}{b^3\ln(f)^3}-\frac{2\,x^9}{b^4\ln(f)^4}\right)}{x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^3)/x^13,x)
```

```
[Out] -(f^(a + b/x^3)*(1/(3*b*log(f)) - x^3/(b^2*log(f)^2) + (2*x^6)/(b^3*log(f)^
3) - (2*x^9)/(b^4*log(f)^4)))/x^9
```

sympy [A] time = 0.16, size = 58, normalized size = 0.70

$$\frac{f^{a+\frac{b}{x^3}}\left(-b^3\log\left(f\right)^3+3b^2x^3\log\left(f\right)^2-6bx^6\log\left(f\right)+6x^9\right)}{3b^4x^9\log\left(f\right)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**3)/x**13,x)
```

```
[Out] f**(a + b/x**3)*(-b**3*log(f)**3 + 3*b**2*x**3*log(f)**2 - 6*b*x**6*log(f)
+ 6*x**9)/(3*b**4*x**9*log(f)**4)
```

3.165 $\int \frac{f^{a+\frac{b}{x^3}}}{x^{16}}\,dx$

Optimal. Leaf size=69

$$-\frac{f^{a+\frac{b}{x^3}}\left(b^4\log^4(f)-4b^3x^3\log^3(f)+12b^2x^6\log^2(f)-24bx^9\log(f)+24x^{12}\right)}{3b^5x^{12}\log^5(f)}$$

```
[Out] -1/3*f^(a+b/x^3)*(24*x^12-24*b*x^9*ln(f)+12*b^2*x^6*ln(f)^2-4*b^3*x^3*ln(f)
^3+b^4*ln(f)^4)/b^5/x^12/ln(f)^5
```

Rubi [C] time = 0.02, antiderivative size = 24, normalized size of antiderivative = 0.35, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2218}

$$-\frac{f^a\text{Gamma}\left(5,-\frac{b\log(f)}{x^3}\right)}{3b^5\log^5(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^3)/x^16,x]
```

```
[Out] -(f^a*Gamma[5, -((b*Log[f])/x^3)])/(3*b^5*Log[f]^5)
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x^3}}}{x^{16}}\,dx=-\frac{f^a\Gamma\left(5,-\frac{b\log(f)}{x^3}\right)}{3b^5\log^5(f)}$$

Mathematica [C] time = 0.00, size = 24, normalized size = 0.35

$$-\frac{f^a\Gamma\left(5,-\frac{b\log(f)}{x^3}\right)}{3b^5\log^5(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^3)/x^16,x]
```

```
[Out] -1/3*(f^a*Gamma[5, -((b*Log[f])/x^3)])/(b^5*Log[f]^5)
```

fricas [A] time = 0.42, size = 71, normalized size = 1.03

$$-\frac{\left(24\,x^{12}-24\,bx^{9}\log(f)+12\,b^{2}x^{6}\log(f)^{2}-4\,b^{3}x^{3}\log(f)^{3}+b^{4}\log(f)^{4}\right)f^{\frac{ax^{3}+b}{x^{3}}}}{3\,b^{5}x^{12}\log(f)^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^16,x, algorithm="fricas")
```

```
[Out] -1/3*(24*x^12 - 24*b*x^9*log(f) + 12*b^2*x^6*log(f)^2 - 4*b^3*x^3*log(f)^3
+ b^4*log(f)^4)*f^((a*x^3 + b)/x^3)/(b^5*x^12*log(f)^5)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+\frac{b}{x^{3}}}}{x^{16}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^16,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^3)/x^16, x)
```

maple [A] time = 0.04, size = 121, normalized size = 1.75

$$\frac{-\frac{8x^{15}e^{\left(a+\frac{b}{x^{3}}\right)\ln(f)}}{b^{5}\ln(f)^{5}}+\frac{8x^{12}e^{\left(a+\frac{b}{x^{3}}\right)\ln(f)}}{b^{4}\ln(f)^{4}}-\frac{4x^{9}e^{\left(a+\frac{b}{x^{3}}\right)\ln(f)}}{b^{3}\ln(f)^{3}}+\frac{4x^{6}e^{\left(a+\frac{b}{x^{3}}\right)\ln(f)}}{3b^{2}\ln(f)^{2}}-\frac{x^{3}e^{\left(a+\frac{b}{x^{3}}\right)\ln(f)}}{3b\ln(f)}}{x^{15}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^3)/x^16,x)
```

```
[Out] (-8/b^5/ln(f)^5*x^15*exp((a+b/x^3)*ln(f))+8/b^4*x^12*exp((a+b/x^3)*ln(f))/l
n(f)^4-4/b^3*x^9*exp((a+b/x^3)*ln(f))/ln(f)^3+4/3/b^2*x^6*exp((a+b/x^3)*ln(
f))/ln(f)^2-1/3/b*x^3*exp((a+b/x^3)*ln(f))/ln(f))/x^15
```

maxima [C] time = 1.39, size = 22, normalized size = 0.32

$$-\frac{f^{a}\Gamma\left(5,-\frac{b\log(f)}{x^{3}}\right)}{3\,b^{5}\log(f)^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^16,x, algorithm="maxima")
```

```
[Out] -1/3*f^a*gamma(5, -b*log(f)/x^3)/(b^5*log(f)^5)
```

mupad [B] time = 3.52, size = 72, normalized size = 1.04

$$-\frac{f^{a+\frac{b}{x^3}}\left(\frac{1}{3\,b\,\ln(f)}-\frac{4\,x^3}{3\,b^2\ln(f)^2}+\frac{4\,x^6}{b^3\ln(f)^3}-\frac{8\,x^9}{b^4\ln(f)^4}+\frac{8\,x^{12}}{b^5\ln(f)^5}\right)}{x^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^3)/x^16,x)
```

```
[Out] -(f^(a + b/x^3)*(1/(3*b*log(f)) - (4*x^3)/(3*b^2*log(f)^2) + (4*x^6)/(b^3*l
og(f)^3) - (8*x^9)/(b^4*log(f)^4) + (8*x^12)/(b^5*log(f)^5)))/x^12
```

sympy [A] time = 0.17, size = 71, normalized size = 1.03

$$\frac{f^{a+\frac{b}{x^3}}\left(-b^4\log(f)^4+4b^3x^3\log(f)^3-12b^2x^6\log(f)^2+24bx^9\log(f)-24x^{12}\right)}{3b^5x^{12}\log(f)^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**3)/x**16,x)
```

```
[Out] f**(a + b/x**3)*(-b**4*log(f)**4 + 4*b**3*x**3*log(f)**3 - 12*b**2*x**6*log
(f)**2 + 24*b*x**9*log(f) - 24*x**12)/(3*b**5*x**12*log(f)**5)
```

3.166 $\int \frac{f^{a+\frac{b}{x^3}}}{x^{19}}\,dx$

Optimal. Leaf size=82

$$\frac{f^{a+\frac{b}{x^3}}\left(-b^5\log^5(f)+5b^4x^3\log^4(f)-20b^3x^6\log^3(f)+60b^2x^9\log^2(f)-120bx^{12}\log(f)+120x^{15}\right)}{3b^6x^{15}\log^6(f)}$$

```
[Out] 1/3*f^(a+b/x^3)*(120*x^15-120*b*x^12*ln(f)+60*b^2*x^9*ln(f)^2-20*b^3*x^6*ln
(f)^3+5*b^4*x^3*ln(f)^4-b^5*ln(f)^5)/b^6/x^15/ln(f)^6
```

Rubi [C] time = 0.02, antiderivative size = 24, normalized size of antiderivative = 0.29, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2218}

$$\frac{f^a\text{Gamma}\left(6,-\frac{b\log(f)}{x^3}\right)}{3b^6\log^6(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^3)/x^19,x]
```

```
[Out] (f^a*Gamma[6, -((b*Log[f])/x^3)])/(3*b^6*Log[f]^6)
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x^3}}}{x^{19}}\,dx=\frac{f^a\Gamma\left(6,-\frac{b\log(f)}{x^3}\right)}{3b^6\log^6(f)}$$

Mathematica [C] time = 0.00, size = 24, normalized size = 0.29

$$\frac{f^a\Gamma\left(6,-\frac{b\log(f)}{x^3}\right)}{3b^6\log^6(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^3)/x^19,x]
```

```
[Out] (f^a*Gamma[6, -((b*Log[f])/x^3)])/(3*b^6*Log[f]^6)
```

fricas [A] time = 0.41, size = 84, normalized size = 1.02

$$\frac{\left(120\,x^{15}-120\,bx^{12}\log(f)+60\,b^{2}x^{9}\log(f)^{2}-20\,b^{3}x^{6}\log(f)^{3}+5\,b^{4}x^{3}\log(f)^{4}-b^{5}\log(f)^{5}\right)f^{\frac{ax^{3}+b}{x^{3}}}}{3\,b^{6}x^{15}\log(f)^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^19,x, algorithm="fricas")
```

```
[Out] 1/3*(120*x^15 - 120*b*x^12*log(f) + 60*b^2*x^9*log(f)^2 - 20*b^3*x^6*log(f)
^3 + 5*b^4*x^3*log(f)^4 - b^5*log(f)^5)*f^((a*x^3 + b)/x^3)/(b^6*x^15*log(f
)^6)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+\frac{b}{x^{3}}}}{x^{19}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^19,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^3)/x^19, x)
```

maple [A] time = 0.03, size = 84, normalized size = 1.02

$$-\frac{\left(-120x^{15}+120b\,x^{12}\ln(f)-60b^{2}x^{9}\ln(f)^{2}+20b^{3}x^{6}\ln(f)^{3}-5b^{4}x^{3}\ln(f)^{4}+b^{5}\ln(f)^{5}\right)f^{\frac{a\,x^{3}+b}{x^{3}}}}{3b^{6}x^{15}\ln(f)^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^3)/x^19,x)
```

```
[Out] -1/3*(-120*x^15+120*b*x^12*ln(f)-60*b^2*x^9*ln(f)^2+20*b^3*x^6*ln(f)^3-5*b^
4*x^3*ln(f)^4+b^5*ln(f)^5)/ln(f)^6/b^6/x^15*f^((a*x^3+b)/x^3)
```

maxima [C] time = 1.13, size = 22, normalized size = 0.27

$$\frac{f^{a}\Gamma\left(6,-\frac{b\log(f)}{x^{3}}\right)}{3\,b^{6}\log(f)^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^19,x, algorithm="maxima")
```

```
[Out] 1/3*f^a*gamma(6, -b*log(f)/x^3)/(b^6*log(f)^6)
```

mupad [B] time = 3.59, size = 84, normalized size = 1.02

$$-\frac{f^{a+\frac{b}{x^3}}\left(\frac{1}{3\,b\,\ln(f)}-\frac{5\,x^3}{3\,b^2\ln(f)^2}+\frac{20\,x^6}{3\,b^3\ln(f)^3}-\frac{20\,x^9}{b^4\ln(f)^4}+\frac{40\,x^{12}}{b^5\ln(f)^5}-\frac{40\,x^{15}}{b^6\ln(f)^6}\right)}{x^{15}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^3)/x^19,x)
```

```
[Out] -(f^(a + b/x^3)*(1/(3*b*log(f)) - (5*x^3)/(3*b^2*log(f)^2) + (20*x^6)/(3*b^
3*log(f)^3) - (20*x^9)/(b^4*log(f)^4) + (40*x^12)/(b^5*log(f)^5) - (40*x^15
)/(b^6*log(f)^6)))/x^15
```

sympy [A] time = 0.18, size = 85, normalized size = 1.04

$$\frac{f^{a+\frac{b}{x^3}}\left(-b^5\log(f)^5+5b^4x^3\log(f)^4-20b^3x^6\log(f)^3+60b^2x^9\log(f)^2-120bx^{12}\log(f)+120x^{15}\right)}{3b^6x^{15}\log(f)^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**3)/x**19,x)
```

```
[Out] f**(a + b/x**3)*(-b**5*log(f)**5 + 5*b**4*x**3*log(f)**4 - 20*b**3*x**6*log
(f)**3 + 60*b**2*x**9*log(f)**2 - 120*b*x**12*log(f) + 120*x**15)/(3*b**6*x
**15*log(f)**6)
```

3.167 $\int f^{a+\frac{b}{x^3}} x^4 \, dx$

Optimal. Leaf size=34

$$\frac{1}{3}x^5 f^a \left(-\frac{b\log(f)}{x^3}\right)^{5/3} \Gamma\left(-\frac{5}{3},-\frac{b\log(f)}{x^3}\right)$$

```
[Out] 1/3*f^a*x^5*GAMMA(-5/3,-b*ln(f)/x^3)*(-b*ln(f)/x^3)^(5/3)
```

Rubi [A] time = 0.03, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2218}

$$\frac{1}{3}x^5 f^a \left(-\frac{b\log(f)}{x^3}\right)^{5/3} \text{Gamma}\left(-\frac{5}{3},-\frac{b\log(f)}{x^3}\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^3)*x^4,x]
```

```
[Out] (f^a*x^5*Gamma[-5/3, -((b*Log[f])/x^3)]*(-((b*Log[f])/x^3))^(5/3))/3
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+\frac{b}{x^3}} x^4 \, dx = \frac{1}{3} f^a x^5 \Gamma\left(-\frac{5}{3},-\frac{b\log(f)}{x^3}\right)\left(-\frac{b\log(f)}{x^3}\right)^{5/3}$$

Mathematica [A] time = 0.00, size = 34, normalized size = 1.00

$$\frac{1}{3}x^5 f^a \left(-\frac{b\log(f)}{x^3}\right)^{5/3} \Gamma\left(-\frac{5}{3},-\frac{b\log(f)}{x^3}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^3)*x^4,x]
```

```
[Out] (f^a*x^5*Gamma[-5/3, -((b*Log[f])/x^3)]*(-((b*Log[f])/x^3))^(5/3))/3
```

fricas [A] time = 0.43, size = 55, normalized size = 1.62

$$-\frac{3}{10} \left(-b \log(f)\right)^{\frac{2}{3}} b f^{a} \Gamma\left(\frac{1}{3}, -\frac{b \log(f)}{x^{3}}\right) \log(f) + \frac{1}{10} \left(2 x^{5} + 3 b x^{2} \log(f)\right) f^{\frac{a x^{3}+b}{x^{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)*x^4,x, algorithm="fricas")
```

```
[Out] -3/10*(-b*log(f))^(2/3)*b*f^a*gamma(1/3, -b*log(f)/x^3)*log(f) + 1/10*(2*x^
5 + 3*b*x^2*log(f))*f^((a*x^3 + b)/x^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x^{3}}} x^{4}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)*x^4,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^3)*x^4, x)
```

maple [B] time = 0.06, size = 120, normalized size = 3.53

$$-\frac{(-b)^{\frac{5}{3}} \left(-\frac{3\left(\frac{3b\ln(f)}{2x^{3}}+1\right)x^{5} e^{\frac{b\ln(f)}{x^{3}}}}{5(-b)^{\frac{5}{3}} \ln(f)^{\frac{5}{3}}} - \frac{9b^{2}\Gamma\left(\frac{1}{3}, -\frac{b\ln(f)}{x^{3}}\right)\ln(f)^{\frac{1}{3}}}{10(-b)^{\frac{5}{3}}\left(-\frac{b\ln(f)}{x^{3}}\right)^{\frac{1}{3}} x} + \frac{3\pi\sqrt{3}\, b^{2}\ln(f)^{\frac{1}{3}}}{5(-b)^{\frac{5}{3}}\Gamma\left(\frac{2}{3}\right)\left(-\frac{b\ln(f)}{x^{3}}\right)^{\frac{1}{3}} x}\right) f^{a} \ln(f)^{\frac{5}{3}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^3)*x^4,x)
```

```
[Out] -1/3*f^a*(-b)^(5/3)*ln(f)^(5/3)*(3/5/x/(-b)^(5/3)*ln(f)^(1/3)*b^2*Pi*3^(1/2
)/GAMMA(2/3)/(-b/x^3*ln(f))^(1/3)-3/5*x^5/(-b)^(5/3)/ln(f)^(5/3)*(3/2*b/x^3
*ln(f)+1)*exp(b/x^3*ln(f))-9/10/x/(-b)^(5/3)*ln(f)^(1/3)*b^2/(-b/x^3*ln(f))
^(1/3)*GAMMA(1/3,-b/x^3*ln(f)))
```

maxima [A] time = 1.33, size = 28, normalized size = 0.82

$$\frac{1}{3} f^{a} x^{5} \left(-\frac{b \log(f)}{x^{3}}\right)^{\frac{5}{3}} \Gamma\left(-\frac{5}{3}, -\frac{b \log(f)}{x^{3}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)*x^4,x, algorithm="maxima")
```

```
[Out] 1/3*f^a*x^5*(-b*log(f)/x^3)^(5/3)*gamma(-5/3, -b*log(f)/x^3)
```

mupad [B] time = 3.57, size = 88, normalized size = 2.59

$$\frac{f^a f^{\frac{b}{x^3}} x^5}{5} + \frac{3 f^a x^5 \Gamma\left(\frac{1}{3}, -\frac{b \ln(f)}{x^3}\right) \left(-\frac{b \ln(f)}{x^3}\right)^{5/3}}{10} + \frac{3 b f^a f^{\frac{b}{x^3}} x^2 \ln(f)}{10} - \frac{\pi \sqrt{3} f^a x^5 \left(-\frac{b \ln(f)}{x^3}\right)^{5/3}}{5 \Gamma\left(\frac{2}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^3)*x^4,x)
```

```
[Out] (f^a*f^(b/x^3)*x^5)/5 + (3*f^a*x^5*igamma(1/3, -(b*log(f))/x^3)*(-(b*log(f)
)/x^3)^(5/3))/10 + (3*b*f^a*f^(b/x^3)*x^2*log(f))/10 - (3^(1/2)*f^a*x^5*pi*
(-(b*log(f))/x^3)^(5/3))/(5*gamma(2/3))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x^3}} x^4 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**3)*x**4,x)
```

```
[Out] Integral(f**(a + b/x**3)*x**4, x)
```

3.168 $\int f^{a+\frac{b}{x^3}} x^3 \, dx$

Optimal. Leaf size=34

$$\frac{1}{3}x^4 f^a \left(-\frac{b\log(f)}{x^3}\right)^{4/3} \Gamma\left(-\frac{4}{3},-\frac{b\log(f)}{x^3}\right)$$

```
[Out] 1/3*f^a*x^4*GAMMA(-4/3,-b*ln(f)/x^3)*(-b*ln(f)/x^3)^(4/3)
```

Rubi [A] time = 0.02, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2218}

$$\frac{1}{3}x^4 f^a \left(-\frac{b\log(f)}{x^3}\right)^{4/3} \text{Gamma}\left(-\frac{4}{3},-\frac{b\log(f)}{x^3}\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^3)*x^3,x]
```

```
[Out] (f^a*x^4*Gamma[-4/3, -((b*Log[f])/x^3)]*(-((b*Log[f])/x^3))^(4/3))/3
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+\frac{b}{x^3}} x^3 \, dx = \frac{1}{3}f^a x^4 \Gamma\left(-\frac{4}{3},-\frac{b\log(f)}{x^3}\right)\left(-\frac{b\log(f)}{x^3}\right)^{4/3}$$

Mathematica [A] time = 0.00, size = 34, normalized size = 1.00

$$\frac{1}{3}x^4 f^a \left(-\frac{b\log(f)}{x^3}\right)^{4/3} \Gamma\left(-\frac{4}{3},-\frac{b\log(f)}{x^3}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^3)*x^3,x]
[Out] (f^a*x^4*Gamma[-4/3, -((b*Log[f])/x^3)]*(-((b*Log[f])/x^3))^(4/3))/3
```

fricas [A] time = 0.44, size = 51, normalized size = 1.50

$$-\frac{3}{4}\left(-b\log(f)\right)^{\frac{1}{3}}bf^{a}\Gamma\left(\frac{2}{3},-\frac{b\log(f)}{x^{3}}\right)\log(f)+\frac{1}{4}\left(x^{4}+3\,bx\log(f)\right)f^{\frac{ax^{3}+b}{x^{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)*x^3,x, algorithm="fricas")
[Out] -3/4*(-b*log(f))^(1/3)*b*f^a*gamma(2/3, -b*log(f)/x^3)*log(f) + 1/4*(x^4 +
3*b*x*log(f))*f^((a*x^3 + b)/x^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x^{3}}}x^{3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)*x^3,x, algorithm="giac")
[Out] integrate(f^(a + b/x^3)*x^3, x)
```

maple [B] time = 0.06, size = 115, normalized size = 3.38

$$\frac{(-b)^{\frac{1}{3}}\left(-\frac{3\left(\frac{3b\ln(f)}{x^{3}}+1\right)x^{4}\mathrm{e}^{\frac{b\ln(f)}{x^{3}}}}{4(-b)^{\frac{4}{3}}\ln(f)^{\frac{4}{3}}}-\frac{9b^{2}\Gamma\left(\frac{2}{3},-\frac{b\ln(f)}{x^{3}}\right)\ln(f)^{\frac{2}{3}}}{4(-b)^{\frac{4}{3}}\left(-\frac{b\ln(f)}{x^{3}}\right)^{\frac{2}{3}}x^{2}}+\frac{9\Gamma\left(\frac{2}{3}\right)b^{2}\ln(f)^{\frac{2}{3}}}{4(-b)^{\frac{4}{3}}\left(-\frac{b\ln(f)}{x^{3}}\right)^{\frac{2}{3}}x^{2}}\right)b\,f^{a}\ln(f)^{\frac{4}{3}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^3)*x^3,x)
[Out] 1/3*f^a*b*ln(f)^(4/3)*(-b)^(1/3)*(9/4/x^2/(-b)^(4/3)*ln(f)^(2/3)*b^2*GAMMA(
2/3)/(-b/x^3*ln(f))^(2/3)-3/4*x^4/(-b)^(4/3)/ln(f)^(4/3)*(3*b/x^3*ln(f)+1)*
exp(b/x^3*ln(f))-9/4/x^2/(-b)^(4/3)*ln(f)^(2/3)*b^2/(-b/x^3*ln(f))^(2/3)*GA
MMA(2/3,-b/x^3*ln(f)))
```

maxima [A] time = 1.28, size = 28, normalized size = 0.82

$$\frac{1}{3}f^{a}x^{4}\left(-\frac{b\log(f)}{x^{3}}\right)^{\frac{4}{3}}\Gamma\left(-\frac{4}{3},-\frac{b\log(f)}{x^{3}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)*x^3,x, algorithm="maxima")
```

```
[Out] 1/3*f^a*x^4*(-b*log(f)/x^3)^(4/3)*gamma(-4/3, -b*log(f)/x^3)
```

mupad [B] time = 3.59, size = 80, normalized size = 2.35

$$\frac{f^a\,f^{\frac{b}{x^3}}\,x^4}{4}-\frac{3\,f^a\,x^4\,\Gamma\left(\frac{2}{3}\right)\,{\left(-\frac{b\,\ln(f)}{x^3}\right)}^{4/3}}{4}+\frac{3\,f^a\,x^4\,\Gamma\left(\frac{2}{3},-\frac{b\,\ln(f)}{x^3}\right)\,{\left(-\frac{b\,\ln(f)}{x^3}\right)}^{4/3}}{4}+\frac{3\,b\,f^a\,f^{\frac{b}{x^3}}\,x\,\ln(f)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^3)*x^3,x)
```

```
[Out] (f^a*f^(b/x^3)*x^4)/4 - (3*f^a*x^4*gamma(2/3)*(-(b*log(f))/x^3)^(4/3))/4 +
(3*f^a*x^4*igamma(2/3, -(b*log(f))/x^3)*(-(b*log(f))/x^3)^(4/3))/4 + (3*b*f
^a*f^(b/x^3)*x*log(f))/4
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x^3}}x^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**3)*x**3,x)
```

```
[Out] Integral(f**(a + b/x**3)*x**3, x)
```

3.169 $\int f^{a+\frac{b}{x^3}} x \, dx$

Optimal. Leaf size=34

$$\frac{1}{3}x^2 f^a \left(-\frac{b\log(f)}{x^3}\right)^{2/3} \Gamma\left(-\frac{2}{3},-\frac{b\log(f)}{x^3}\right)$$

```
[Out] 1/3*f^a*x^2*GAMMA(-2/3,-b*ln(f)/x^3)*(-b*ln(f)/x^3)^(2/3)
```

Rubi [A] time = 0.01, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {2218}

$$\frac{1}{3}x^2 f^a \left(-\frac{b\log(f)}{x^3}\right)^{2/3} \text{Gamma}\left(-\frac{2}{3},-\frac{b\log(f)}{x^3}\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^3)*x,x]
```

```
[Out] (f^a*x^2*Gamma[-2/3, -((b*Log[f])/x^3)]*(-((b*Log[f])/x^3))^(2/3))/3
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+\frac{b}{x^3}} x \, dx = \frac{1}{3} f^a x^2 \Gamma\left(-\frac{2}{3},-\frac{b\log(f)}{x^3}\right)\left(-\frac{b\log(f)}{x^3}\right)^{2/3}$$

Mathematica [A] time = 0.00, size = 34, normalized size = 1.00

$$\frac{1}{3}x^2 f^a \left(-\frac{b\log(f)}{x^3}\right)^{2/3} \Gamma\left(-\frac{2}{3},-\frac{b\log(f)}{x^3}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^3)*x,x]
```

```
[Out] (f^a*x^2*Gamma[-2/3, -((b*Log[f])/x^3)]*(-((b*Log[f])/x^3))^(2/3))/3
```

fricas [A] time = 0.43, size = 41, normalized size = 1.21

$$\frac{1}{2} f^{\frac{ax^3+b}{x^3}} x^2 - \frac{1}{2} \left(-b \log(f)\right)^{\frac{2}{3}} f^a \Gamma\left(\frac{1}{3}, -\frac{b \log(f)}{x^3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)*x,x, algorithm="fricas")
```

```
[Out] 1/2*f^((a*x^3 + b)/x^3)*x^2 - 1/2*(-b*log(f))^(2/3)*f^a*gamma(1/3, -b*log(f
)/x^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x^3}} x \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)*x,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^3)*x, x)
```

maple [B] time = 0.06, size = 105, normalized size = 3.09

$$-\frac{(-b)^{\frac{2}{3}} \left(-\frac{3x^2 e^{\frac{b \ln(f)}{x^3}}}{2(-b)^{\frac{2}{3}} \ln(f)^{\frac{2}{3}}} - \frac{3b\Gamma\left(\frac{1}{3}, -\frac{b \ln(f)}{x^3}\right) \ln(f)^{\frac{1}{3}}}{2(-b)^{\frac{2}{3}} \left(-\frac{b \ln(f)}{x^3}\right)^{\frac{1}{3}} x} + \frac{\pi \sqrt{3}\, b \ln(f)^{\frac{1}{3}}}{(-b)^{\frac{2}{3}} \Gamma\left(\frac{2}{3}\right) \left(-\frac{b \ln(f)}{x^3}\right)^{\frac{1}{3}} x}\right) f^a \ln(f)^{\frac{2}{3}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^3)*x,x)
```

```
[Out] -1/3*f^a*(-b)^(2/3)*ln(f)^(2/3)*(1/x/(-b)^(2/3)*ln(f)^(1/3)*b*Pi*3^(1/2)/GA
MMA(2/3)/(-b/x^3*ln(f))^(1/3)-3/2*x^2/(-b)^(2/3)/ln(f)^(2/3)*exp(b/x^3*ln(f
))-3/2/x/(-b)^(2/3)*ln(f)^(1/3)*b/(-b/x^3*ln(f))^(1/3)*GAMMA(1/3,-b/x^3*ln(
f)))
```

maxima [A] time = 1.30, size = 28, normalized size = 0.82

$$\frac{1}{3} f^a x^2 \left(-\frac{b \log(f)}{x^3}\right)^{\frac{2}{3}} \Gamma\left(-\frac{2}{3}, -\frac{b \log(f)}{x^3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)*x,x, algorithm="maxima")
```

```
[Out] 1/3*f^a*x^2*(-b*log(f)/x^3)^(2/3)*gamma(-2/3, -b*log(f)/x^3)
```

mupad [B] time = 3.57, size = 70, normalized size = 2.06

$$\frac{f^a\,f^{\frac{b}{x^3}}\,x^2}{2}-\frac{f^a\,x^2\,\Gamma\left(\frac{1}{3},-\frac{b\,\ln(f)}{x^3}\right)\,\left(-\frac{b\,\ln(f)}{x^3}\right)^{2/3}}{2}+\frac{\pi\,\sqrt{3}\,f^a\,x^2\,\left(-\frac{b\,\ln(f)}{x^3}\right)^{2/3}}{3\,\Gamma\left(\frac{2}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^3)*x,x)
```

```
[Out] (f^a*f^(b/x^3)*x^2)/2 - (f^a*x^2*igamma(1/3, -(b*log(f))/x^3)*(-(b*log(f))/
x^3)^(2/3))/2 + (3^(1/2)*f^a*x^2*pi*(-(b*log(f))/x^3)^(2/3))/(3*gamma(2/3))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x^3}}x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**3)*x,x)
```

```
[Out] Integral(f**(a + b/x**3)*x, x)
```

3.170 $\int f^{a+\frac{b}{x^3}}\,dx$

Optimal. Leaf size=32

$$\frac{1}{3}xf^a\sqrt[3]{-\frac{b\log(f)}{x^3}}\,\Gamma\left(-\frac{1}{3},-\frac{b\log(f)}{x^3}\right)$$

```
[Out] 1/3*f^a*x*GAMMA(-1/3,-b*ln(f)/x^3)*(-b*ln(f)/x^3)^(1/3)
```

Rubi [A] time = 0.00, antiderivative size = 32, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2208}

$$\frac{1}{3}xf^a\sqrt[3]{-\frac{b\log(f)}{x^3}}\,\text{Gamma}\left(-\frac{1}{3},-\frac{b\log(f)}{x^3}\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^3),x]
```

```
[Out] (f^a*x*Gamma[-1/3, -((b*Log[f])/x^3)]*(-((b*Log[f])/x^3))^(1/3))/3
```

Rule 2208

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> -Simp[(F^a
*(c + d*x)*Gamma[1/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x)^n*Log[F
]))^(1/n)), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rubi steps

$$\int f^{a+\frac{b}{x^3}}\,dx=\frac{1}{3}f^a x\Gamma\left(-\frac{1}{3},-\frac{b\log(f)}{x^3}\right)\sqrt[3]{-\frac{b\log(f)}{x^3}}$$

Mathematica [A] time = 0.00, size = 32, normalized size = 1.00

$$\frac{1}{3}xf^a\sqrt[3]{-\frac{b\log(f)}{x^3}}\,\Gamma\left(-\frac{1}{3},-\frac{b\log(f)}{x^3}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^3),x]
```

```
[Out] (f^a*x*Gamma[-1/3, -((b*Log[f])/x^3)]*(-((b*Log[f])/x^3))^(1/3))/3
```

fricas [A] time = 0.43, size = 38, normalized size = 1.19

$$-\left(-b\log(f)\right)^{\frac{1}{3}}f^{a}\Gamma\left(\frac{2}{3},-\frac{b\log(f)}{x^{3}}\right)+f^{\frac{ax^{3}+b}{x^{3}}}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3),x, algorithm="fricas")
[Out] -(-b*log(f))^(1/3)*f^a*gamma(2/3, -b*log(f)/x^3) + f^((a*x^3 + b)/x^3)*x
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x^{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3),x, algorithm="giac")
[Out] integrate(f^(a + b/x^3), x)
```

maple [B] time = 0.05, size = 98, normalized size = 3.06

$$-\frac{(-b)^{\frac{1}{3}}\left(-\frac{3x\,e^{\frac{b\ln(f)}{x^{3}}}}{(-b)^{\frac{1}{3}}\ln(f)^{\frac{1}{3}}}-\frac{3b\Gamma\left(\frac{2}{3},-\frac{b\ln(f)}{x^{3}}\right)\ln(f)^{\frac{2}{3}}}{(-b)^{\frac{1}{3}}\left(-\frac{b\ln(f)}{x^{3}}\right)^{\frac{2}{3}}x^{2}}+\frac{3\Gamma\left(\frac{2}{3}\right)b\ln(f)^{\frac{2}{3}}}{(-b)^{\frac{1}{3}}\left(-\frac{b\ln(f)}{x^{3}}\right)^{\frac{2}{3}}x^{2}}\right)f^{a}\ln(f)^{\frac{1}{3}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^3),x)
[Out] -1/3*f^a*(-b)^(1/3)*ln(f)^(1/3)*(3/x^2/(-b)^(1/3)*ln(f)^(2/3)*b*GAMMA(2/3)/
(-b/x^3*ln(f))^(2/3)-3*x/(-b)^(1/3)/ln(f)^(1/3)*exp(b/x^3*ln(f))-3/x^2/(-b)
^(1/3)*ln(f)^(2/3)*b/(-b/x^3*ln(f))^(2/3)*GAMMA(2/3,-b/x^3*ln(f)))
```

maxima [A] time = 1.24, size = 26, normalized size = 0.81

$$\frac{1}{3}f^{a}x\left(-\frac{b\log(f)}{x^{3}}\right)^{\frac{1}{3}}\Gamma\left(-\frac{1}{3},-\frac{b\log(f)}{x^{3}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3),x, algorithm="maxima")
```

```
[Out] 1/3*f^a*x*(-b*log(f)/x^3)^(1/3)*gamma(-1/3, -b*log(f)/x^3)
```

mupad [B] time = 3.59, size = 48, normalized size = 1.50

$$f^a\,x\,\left(f^{\frac{b}{x^3}}+\Gamma\left(\frac{2}{3}\right)\,{\left(-\frac{b\,\ln(f)}{x^3}\right)}^{1/3}-\Gamma\left(\frac{2}{3},-\frac{b\,\ln(f)}{x^3}\right)\,{\left(-\frac{b\,\ln(f)}{x^3}\right)}^{1/3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^3),x)
```

```
[Out] f^a*x*(f^(b/x^3) + gamma(2/3)*(-(b*log(f))/x^3)^(1/3) - igamma(2/3, -(b*log
(f))/x^3)*(-(b*log(f))/x^3)^(1/3))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+\frac{b}{x^3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**3),x)
```

```
[Out] Integral(f**(a + b/x**3), x)
```

3.171 $\int \frac{f^{a+\frac{b}{x^3}}}{x^2}\,dx$

Optimal. Leaf size=34

$$\frac{f^a\Gamma\left(\frac{1}{3},-\frac{b\log(f)}{x^3}\right)}{3x\sqrt[3]{-\frac{b\log(f)}{x^3}}}$$

```
[Out] 1/3*f^a*GAMMA(1/3,-b*ln(f)/x^3)/x/(-b*ln(f)/x^3)^(1/3)
```

Rubi [A] time = 0.02, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2218}

$$\frac{f^a\text{Gamma}\left(\frac{1}{3},-\frac{b\log(f)}{x^3}\right)}{3x\sqrt[3]{-\frac{b\log(f)}{x^3}}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^3)/x^2,x]
```

```
[Out] (f^a*Gamma[1/3, -((b*Log[f])/x^3)])/(3*x*(-((b*Log[f])/x^3))^(1/3))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x^3}}}{x^2}\,dx=\frac{f^a\Gamma\left(\frac{1}{3},-\frac{b\log(f)}{x^3}\right)}{3x\sqrt[3]{-\frac{b\log(f)}{x^3}}}$$

Mathematica [A] time = 0.01, size = 34, normalized size = 1.00

$$\frac{f^a\Gamma\left(\frac{1}{3},-\frac{b\log(f)}{x^3}\right)}{3x\sqrt[3]{-\frac{b\log(f)}{x^3}}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^3)/x^2,x]
[Out] (f^a*Gamma[1/3, -((b*Log[f])/x^3)])/(3*x*(-((b*Log[f])/x^3))^(1/3))
```

fricas [A] time = 0.42, size = 29, normalized size = 0.85

$$-\frac{\left(-b\log(f)\right)^{\frac{2}{3}}f^{a}\Gamma\left(\frac{1}{3},-\frac{b\log(f)}{x^{3}}\right)}{3\,b\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^2,x, algorithm="fricas")
[Out] -1/3*(-b*log(f))^(2/3)*f^a*gamma(1/3, -b*log(f)/x^3)/(b*log(f))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{f^{a+\frac{b}{x^{3}}}}{x^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^2,x, algorithm="giac")
[Out] integrate(f^(a + b/x^3)/x^2, x)
```

maple [B] time = 0.06, size = 82, normalized size = 2.41

$$-\frac{\left(-\frac{(-b)^{\frac{1}{3}}\Gamma\left(\frac{1}{3},-\frac{b\ln(f)}{x^{3}}\right)\ln(f)^{\frac{1}{3}}}{\left(-\frac{b\ln(f)}{x^{3}}\right)^{\frac{1}{3}}x}+\frac{2(-b)^{\frac{1}{3}}\pi\sqrt{3}\,\ln(f)^{\frac{1}{3}}}{3\Gamma\left(\frac{2}{3}\right)\left(-\frac{b\ln(f)}{x^{3}}\right)^{\frac{1}{3}}x}\right)f^{a}}{3\,(-b)^{\frac{1}{3}}\ln(f)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^3)/x^2,x)
[Out] -1/3*f^a/(-b)^(1/3)/ln(f)^(1/3)*(2/3/x*(-b)^(1/3)*ln(f)^(1/3)*Pi*3^(1/2)/GA
MMA(2/3)/(-b/x^3*ln(f))^(1/3)-1/x*(-b)^(1/3)*ln(f)^(1/3)/(-b/x^3*ln(f))^(1/
3)*GAMMA(1/3,-b/x^3*ln(f)))
```

maxima [A] time = 1.38, size = 28, normalized size = 0.82

$$\frac{f^a\Gamma\left(\frac{1}{3}, -\frac{b\log(f)}{x^3}\right)}{3\,x\left(-\frac{b\log(f)}{x^3}\right)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^2,x, algorithm="maxima")
```

```
[Out] 1/3*f^a*gamma(1/3, -b*log(f)/x^3)/(x*(-b*log(f)/x^3)^(1/3))
```

mupad [B] time = 3.58, size = 46, normalized size = 1.35

$$-\frac{2\,\pi\,\sqrt{3}\,f^a-3\,f^a\,\Gamma\left(\frac{2}{3}\right)\,\Gamma\left(\frac{1}{3},-\frac{b\,\ln(f)}{x^3}\right)}{9\,x\,\Gamma\left(\frac{2}{3}\right)\,\left(-\frac{b\,\ln(f)}{x^3}\right)^{1/3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^3)/x^2,x)
```

```
[Out] -(2*3^(1/2)*f^a*pi - 3*f^a*gamma(2/3)*igamma(1/3, -(b*log(f))/x^3))/(9*x*ga
mma(2/3)*(-(b*log(f))/x^3)^(1/3))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+\frac{b}{x^3}}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**3)/x**2,x)
```

```
[Out] Integral(f**(a + b/x**3)/x**2, x)
```

3.172 $\int \frac{f^{a+\frac{b}{x^3}}}{x^3} \, dx$

Optimal. Leaf size=34

$$\frac{f^a\Gamma\left(\frac{2}{3},-\frac{b\log(f)}{x^3}\right)}{3x^2\left(-\frac{b\log(f)}{x^3}\right)^{2/3}}$$

```
[Out] 1/3*f^a*GAMMA(2/3,-b*ln(f)/x^3)/x^2/(-b*ln(f)/x^3)^(2/3)
```

Rubi [A] time = 0.02, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2218}

$$\frac{f^a\text{Gamma}\left(\frac{2}{3},-\frac{b\log(f)}{x^3}\right)}{3x^2\left(-\frac{b\log(f)}{x^3}\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^3)/x^3,x]
```

```
[Out] (f^a*Gamma[2/3, -((b*Log[f])/x^3)])/(3*x^2*(-((b*Log[f])/x^3))^(2/3))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x^3}}}{x^3} \, dx = \frac{f^a\Gamma\left(\frac{2}{3},-\frac{b\log(f)}{x^3}\right)}{3x^2\left(-\frac{b\log(f)}{x^3}\right)^{2/3}}$$

Mathematica [A] time = 0.01, size = 34, normalized size = 1.00

$$\frac{f^a\Gamma\left(\frac{2}{3},-\frac{b\log(f)}{x^3}\right)}{3x^2\left(-\frac{b\log(f)}{x^3}\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^3)/x^3,x]
```

```
[Out] (f^a*Gamma[2/3, -((b*Log[f])/x^3)])/(3*x^2*(-((b*Log[f])/x^3))^(2/3))
```

fricas [A] time = 0.43, size = 29, normalized size = 0.85

$$-\frac{\left(-b\log(f)\right)^{\frac{1}{3}} f^{a}\Gamma\left(\frac{2}{3}, -\frac{b\log(f)}{x^{3}}\right)}{3\,b\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^3,x, algorithm="fricas")
```

```
[Out] -1/3*(-b*log(f))^(1/3)*f^a*gamma(2/3, -b*log(f)/x^3)/(b*log(f))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+\frac{b}{x^{3}}}}{x^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^3,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^3)/x^3, x)
```

maple [B] time = 0.06, size = 78, normalized size = 2.29

$$\frac{(-b)^{\frac{1}{3}}\left(-\frac{(-b)^{\frac{2}{3}}\Gamma\left(\frac{2}{3},-\frac{b\ln(f)}{x^{3}}\right)\ln(f)^{\frac{2}{3}}}{\left(-\frac{b\ln(f)}{x^{3}}\right)^{\frac{2}{3}}x^{2}}+\frac{(-b)^{\frac{2}{3}}\Gamma\left(\frac{2}{3}\right)\ln(f)^{\frac{2}{3}}}{\left(-\frac{b\ln(f)}{x^{3}}\right)^{\frac{2}{3}}x^{2}}\right)f^{a}}{3b\ln(f)^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^3)/x^3,x)
```

```
[Out] 1/3*f^a/b/ln(f)^(2/3)*(-b)^(1/3)*(1/x^2*(-b)^(2/3)*ln(f)^(2/3)*GAMMA(2/3)/(
-b/x^3*ln(f))^(2/3)-1/x^2*(-b)^(2/3)*ln(f)^(2/3)/(-b/x^3*ln(f))^(2/3)*GAMMA
(2/3,-b/x^3*ln(f)))
```

maxima [A] time = 1.40, size = 28, normalized size = 0.82

$$\frac{f^a\Gamma\left(\frac{2}{3}, -\frac{b\log(f)}{x^3}\right)}{3\,x^2\left(-\frac{b\log(f)}{x^3}\right)^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^3,x, algorithm="maxima")
```

```
[Out] 1/3*f^a*gamma(2/3, -b*log(f)/x^3)/(x^2*(-b*log(f)/x^3)^(2/3))
```

mupad [B] time = 3.56, size = 33, normalized size = 0.97

$$-\frac{f^a\left(\Gamma\left(\frac{2}{3}\right)-\Gamma\left(\frac{2}{3}, -\frac{b\,\ln(f)}{x^3}\right)\right)}{3\,x^2\left(-\frac{b\,\ln(f)}{x^3}\right)^{2/3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^3)/x^3,x)
```

```
[Out] -(f^a*(gamma(2/3) - igamma(2/3, -(b*log(f))/x^3)))/(3*x^2*(-(b*log(f))/x^3)
^(2/3))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{f^{a+\frac{b}{x^3}}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**3)/x**3,x)
```

```
[Out] Integral(f**(a + b/x**3)/x**3, x)
```

3.173 $\int \frac{f^{a+\frac{b}{x^3}}}{x^5}\,dx$

Optimal. Leaf size=34

$$\frac{f^a\Gamma\left(\frac{4}{3},-\frac{b\log(f)}{x^3}\right)}{3x^4\left(-\frac{b\log(f)}{x^3}\right)^{4/3}}$$

```
[Out] 1/3*f^a*GAMMA(4/3,-b*ln(f)/x^3)/x^4/(-b*ln(f)/x^3)^(4/3)
```

Rubi [A] time = 0.02, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2218}

$$\frac{f^a\text{Gamma}\left(\frac{4}{3},-\frac{b\log(f)}{x^3}\right)}{3x^4\left(-\frac{b\log(f)}{x^3}\right)^{4/3}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b/x^3)/x^5,x]
```

```
[Out] (f^a*Gamma[4/3, -((b*Log[f])/x^3)])/(3*x^4*(-((b*Log[f])/x^3))^(4/3))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+\frac{b}{x^3}}}{x^5}\,dx = \frac{f^a\Gamma\left(\frac{4}{3},-\frac{b\log(f)}{x^3}\right)}{3x^4\left(-\frac{b\log(f)}{x^3}\right)^{4/3}}$$

Mathematica [A] time = 0.01, size = 34, normalized size = 1.00

$$\frac{f^a\Gamma\left(\frac{4}{3},-\frac{b\log(f)}{x^3}\right)}{3x^4\left(-\frac{b\log(f)}{x^3}\right)^{4/3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b/x^3)/x^5,x]
```

```
[Out] (f^a*Gamma[4/3, -((b*Log[f])/x^3)])/(3*x^4*(-((b*Log[f])/x^3))^(4/3))
```

fricas [A] time = 0.43, size = 53, normalized size = 1.56

$$\frac{\left(-b\log(f)\right)^{\frac{2}{3}} f^a x\Gamma\left(\frac{1}{3}, -\frac{b\log(f)}{x^3}\right) - 3\,bf^{\frac{ax^3+b}{x^3}}\log(f)}{9\,b^2x\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^5,x, algorithm="fricas")
```

```
[Out] 1/9*((-b*log(f))^(2/3)*f^a*x*gamma(1/3, -b*log(f)/x^3) - 3*b*f^((a*x^3 + b)
/x^3)*log(f))/(b^2*x*log(f)^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+\frac{b}{x^3}}}{x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^5,x, algorithm="giac")
```

```
[Out] integrate(f^(a + b/x^3)/x^5, x)
```

maple [B] time = 0.06, size = 112, normalized size = 3.29

$$-\frac{\left(\frac{(-b)^{\frac{4}{3}}\Gamma\left(\frac{1}{3}, -\frac{b\ln(f)}{x^3}\right)\ln(f)^{\frac{1}{3}}}{3\left(-\frac{b\ln(f)}{x^3}\right)^{\frac{1}{3}} bx} + \frac{(-b)^{\frac{4}{3}}\mathrm{e}^{\frac{b\ln(f)}{x^3}}\ln(f)^{\frac{1}{3}}}{bx} - \frac{2(-b)^{\frac{4}{3}}\pi\sqrt{3}\,\ln(f)^{\frac{1}{3}}}{9\Gamma\left(\frac{2}{3}\right)\left(-\frac{b\ln(f)}{x^3}\right)^{\frac{1}{3}} bx}\right) f^a}{3\,(-b)^{\frac{4}{3}}\ln(f)^{\frac{4}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b/x^3)/x^5,x)
```

```
[Out] -1/3*f^a/(-b)^(4/3)/ln(f)^(4/3)*(-2/9/x*(-b)^(4/3)*ln(f)^(1/3)/b*Pi*3^(1/2)
/GAMMA(2/3)/(-b/x^3*ln(f))^(1/3)+1/x*(-b)^(4/3)*ln(f)^(1/3)/b*exp(b/x^3*ln(
f))+1/3/x*(-b)^(4/3)*ln(f)^(1/3)/b/(-b/x^3*ln(f))^(1/3)*GAMMA(1/3,-b/x^3*ln
(f)))
```

maxima [**A**] time = 1.04, size = 28, normalized size = 0.82

$$\frac{f^a\Gamma\left(\frac{4}{3}, -\frac{b\log(f)}{x^3}\right)}{3\,x^4\left(-\frac{b\log(f)}{x^3}\right)^{\frac{4}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b/x^3)/x^5,x, algorithm="maxima")
```

```
[Out] 1/3*f^a*gamma(4/3, -b*log(f)/x^3)/(x^4*(-b*log(f)/x^3)^(4/3))
```

mupad [**B**] time = 3.54, size = 77, normalized size = 2.26

$$\frac{f^a\,\Gamma\left(\frac{1}{3}, -\frac{b\,\ln(f)}{x^3}\right)}{9\,x^4\left(-\frac{b\,\ln(f)}{x^3}\right)^{4/3}} - \frac{f^a\,f^{\frac{b}{x^3}}}{3\,b\,x\,\ln(f)} - \frac{2\,\pi\,\sqrt{3}\,f^a}{27\,x^4\,\Gamma\left(\frac{2}{3}\right)\left(-\frac{b\,\ln(f)}{x^3}\right)^{4/3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b/x^3)/x^5,x)
```

```
[Out] (f^a*igamma(1/3, -(b*log(f))/x^3))/(9*x^4*(-(b*log(f))/x^3)^(4/3)) - (f^a*f
^(b/x^3))/(3*b*x*log(f)) - (2*3^(1/2)*f^a*pi)/(27*x^4*gamma(2/3)*(-(b*log(f
))/x^3)^(4/3))
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b/x**3)/x**5,x)
```

```
[Out] Timed out
```

3.174 $\int f^{a+bx^n} x^m \, dx$

Optimal. Leaf size=46

$$-\frac{f^a x^{m+1} \left(-b \log(f) x^n\right)^{-\frac{m+1}{n}} \Gamma\left(\frac{m+1}{n}, -bx^n \log(f)\right)}{n}$$

```
[Out] -f^a*x^(1+m)*GAMMA((1+m)/n,-b*x^n*ln(f))/n/((-b*x^n*ln(f))^((1+m)/n))
```

Rubi [A] time = 0.03, antiderivative size = 46, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2218}

$$-\frac{f^a x^{m+1} \left(-b \log(f) x^n\right)^{-\frac{m+1}{n}} \text{Gamma}\left(\frac{m+1}{n}, -b \log(f) x^n\right)}{n}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^n)*x^m,x]
```

```
[Out] -((f^a*x^(1 + m)*Gamma[(1 + m)/n, -(b*x^n*Log[f])])/(n*(-(b*x^n*Log[f]))^((
1 + m)/n)))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+bx^n} x^m \, dx = -\frac{f^a x^{1+m} \Gamma\left(\frac{1+m}{n}, -bx^n \log(f)\right) \left(-bx^n \log(f)\right)^{-\frac{1+m}{n}}}{n}$$

Mathematica [A] time = 0.01, size = 46, normalized size = 1.00

$$-\frac{f^a x^{m+1} \left(-b \log(f) x^n\right)^{-\frac{m+1}{n}} \Gamma\left(\frac{m+1}{n}, -bx^n \log(f)\right)}{n}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^n)*x^m,x]
```

```
[Out] -((f^a*x^(1 + m)*Gamma[(1 + m)/n, -(b*x^n*Log[f])])/(n*(-(b*x^n*Log[f]))^((
1 + m)/n)))
```

fricas [F] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(f^{bx^n+a}x^m,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^m,x, algorithm="fricas")
```

```
[Out] integral(f^(b*x^n + a)*x^m, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{bx^n+a}x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^m,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^n + a)*x^m, x)
```

maple [F] time = 0.08, size = 0, normalized size = 0.00

$$\int f^{b\,x^n+a}x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^n+a)*x^m,x)
```

```
[Out] int(f^(b*x^n+a)*x^m,x)
```

maxima [A] time = 1.17, size = 47, normalized size = 1.02

$$-\frac{f^a x^{m+1}\Gamma\left(\frac{m+1}{n},-bx^n\log(f)\right)}{\left(-bx^n\log(f)\right)^{\frac{m+1}{n}}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^m,x, algorithm="maxima")
```

```
[Out] -f^a*x^(m + 1)*gamma((m + 1)/n, -b*x^n*log(f))/((-b*x^n*log(f))^((m + 1)/n)
*n)
```

mupad [B] time = 3.76, size = 79, normalized size = 1.72

$$\frac{f^a\,f^{b\,x^n}\,x^{m+1}\,\mathrm{e}^{-\frac{b\,x^n\,\ln(f)}{2}}\,\mathrm{M}_{1-\frac{m+n+1}{2\,n},\frac{m+n+1}{2\,n}-\frac{1}{2}}\left(b\,x^n\,\ln(f)\right)}{(m+1)\,\left(b\,x^n\,\ln(f)\right)^{\frac{m+n+1}{2\,n}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^n)*x^m,x)
```

```
[Out] (f^a*f^(b*x^n)*x^(m + 1)*exp(-(b*x^n*log(f))/2)*whittakerM(1 - (m + n + 1)/
(2*n), (m + n + 1)/(2*n) - 1/2, b*x^n*log(f)))/((m + 1)*(b*x^n*log(f))^((m
+ n + 1)/(2*n)))
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b*x**n)*x**m,x)
```

```
[Out] Timed out
```

3.175 $\int f^{a+bx^n} x^3\,dx$

Optimal. Leaf size=39

$$-\frac{x^4 f^a \left(-b\log(f)x^n\right)^{-4/n}\Gamma\left(\frac{4}{n},-bx^n\log(f)\right)}{n}$$

[Out] -f^a*x^4*GAMMA(4/n,-b*x^n*ln(f))/n/((-b*x^n*ln(f))^(4/n))

Rubi [A] time = 0.03, antiderivative size = 39, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2218}

$$-\frac{x^4 f^a \left(-b\log(f)x^n\right)^{-4/n}\text{Gamma}\left(\frac{4}{n},-b\log(f)x^n\right)}{n}$$

Antiderivative was successfully verified.

[In] Int[f^(a + b*x^n)*x^3,x]

[Out] -((f^a*x^4*Gamma[4/n, -(b*x^n*Log[f])])/(n*(-(b*x^n*Log[f]))^(4/n)))

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+bx^n}x^3\,dx = -\frac{f^a x^4\Gamma\left(\frac{4}{n},-bx^n\log(f)\right)\left(-bx^n\log(f)\right)^{-4/n}}{n}$$

Mathematica [A] time = 0.01, size = 39, normalized size = 1.00

$$-\frac{x^4 f^a \left(-b\log(f)x^n\right)^{-4/n}\Gamma\left(\frac{4}{n},-bx^n\log(f)\right)}{n}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^n)*x^3,x]
[Out] -((f^a*x^4*Gamma[4/n, -(b*x^n*Log[f])])/(n*(-(b*x^n*Log[f]))^(4/n)))
```

fricas [F] time = 0.42, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(f^{bx^n+a}x^3, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^3,x, algorithm="fricas")
[Out] integral(f^(b*x^n + a)*x^3, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{bx^n+a}x^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^3,x, algorithm="giac")
[Out] integrate(f^(b*x^n + a)*x^3, x)
```

maple [F] time = 0.04, size = 0, normalized size = 0.00

$$\int x^3 f^{b\,x^n+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^n+a)*x^3,x)
[Out] int(f^(b*x^n+a)*x^3,x)
```

maxima [A] time = 1.05, size = 41, normalized size = 1.05

$$-\frac{f^a x^4 \Gamma\left(\frac{4}{n}, -bx^n \log(f)\right)}{\left(-bx^n \log(f)\right)^{\frac{4}{n}} n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^3,x, algorithm="maxima")
[Out] -f^a*x^4*gamma(4/n, -b*x^n*log(f))/((-b*x^n*log(f))^(4/n)*n)
```

mupad [B] time = 3.61, size = 54, normalized size = 1.38

$$\frac{f^a\,x^4\,\mathrm{e}^{\frac{b\,x^n\,\ln(f)}{2}}\,\mathrm{M}_{\frac{1}{2}-\frac{2}{n},\frac{2}{n}}\left(b\,x^n\,\ln(f)\right)}{4\left(b\,x^n\,\ln(f)\right)^{\frac{2}{n}+\frac{1}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^n)*x^3,x)
```

```
[Out] (f^a*x^4*exp((b*x^n*log(f))/2)*whittakerM(1/2 - 2/n, 2/n, b*x^n*log(f)))/(4
*(b*x^n*log(f))^(2/n + 1/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\begin{cases} -\frac{bf^a f^{bx^n} n x^4 x^n \log(f)}{4n+16} + \frac{f^a f^{bx^n} n x^4}{4n+16} + \frac{4f^a f^{bx^n} x^4}{4n+16} & \text{for}\ n \neq -4 \\ \int f^{a+\frac{b}{x^4}} x^3\,dx & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b*x**n)*x**3,x)
```

```
[Out] Piecewise((-b*f**a*f**(b*x**n)*n*x**4*x**n*log(f)/(4*n + 16) + f**a*f**(b*x
**n)*n*x**4/(4*n + 16) + 4*f**a*f**(b*x**n)*x**4/(4*n + 16), Ne(n, -4)), (I
ntegral(f**(a + b/x**4)*x**3, x), True))
```

3.176 $\int f^{a+bx^n} x^2\,dx$

Optimal. Leaf size=39

$$-\frac{x^3 f^a \left(-b\log(f)x^n\right)^{-3/n}\Gamma\left(\frac{3}{n},-bx^n\log(f)\right)}{n}$$

```
[Out] -f^a*x^3*GAMMA(3/n,-b*x^n*ln(f))/n/((-b*x^n*ln(f))^(3/n))
```

Rubi [A] time = 0.03, antiderivative size = 39, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2218}

$$-\frac{x^3 f^a \left(-b\log(f)x^n\right)^{-3/n}\text{Gamma}\left(\frac{3}{n},-b\log(f)x^n\right)}{n}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^n)*x^2,x]
```

```
[Out] -((f^a*x^3*Gamma[3/n, -(b*x^n*Log[f])])/(n*(-(b*x^n*Log[f]))^(3/n)))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+bx^n}x^2\,dx = -\frac{f^a x^3\Gamma\left(\frac{3}{n},-bx^n\log(f)\right)\left(-bx^n\log(f)\right)^{-3/n}}{n}$$

Mathematica [A] time = 0.01, size = 39, normalized size = 1.00

$$-\frac{x^3 f^a \left(-b\log(f)x^n\right)^{-3/n}\Gamma\left(\frac{3}{n},-bx^n\log(f)\right)}{n}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^n)*x^2,x]
```

```
[Out] -((f^a*x^3*Gamma[3/n, -(b*x^n*Log[f])])/(n*(-(b*x^n*Log[f]))^(3/n)))
```

fricas [F] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(f^{bx^n+a}x^2,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^2,x, algorithm="fricas")
```

```
[Out] integral(f^(b*x^n + a)*x^2, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{bx^n+a}x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^2,x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^n + a)*x^2, x)
```

maple [F] time = 0.06, size = 0, normalized size = 0.00

$$\int x^2 f^{b\,x^n+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^n+a)*x^2,x)
```

```
[Out] int(f^(b*x^n+a)*x^2,x)
```

maxima [A] time = 0.95, size = 41, normalized size = 1.05

$$-\frac{f^a x^3\Gamma\left(\frac{3}{n},-bx^n\log(f)\right)}{\left(-bx^n\log(f)\right)^{\frac{3}{n}}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^2,x, algorithm="maxima")
```

```
[Out] -f^a*x^3*gamma(3/n, -b*x^n*log(f))/((-b*x^n*log(f))^(3/n)*n)
```

mupad [B] time = 3.51, size = 54, normalized size = 1.38

$$\frac{f^a\,x^3\,\mathrm{e}^{\frac{b\,x^n\,\ln(f)}{2}}\,\mathrm{M}_{\frac{1}{2}-\frac{3}{2\,n},\frac{3}{2\,n}}\left(b\,x^n\,\ln(f)\right)}{3\left(b\,x^n\,\ln(f)\right)^{\frac{3}{2\,n}+\frac{1}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^n)*x^2,x)
```

```
[Out] (f^a*x^3*exp((b*x^n*log(f))/2)*whittakerM(1/2 - 3/(2*n), 3/(2*n), b*x^n*log
(f)))/(3*(b*x^n*log(f))^(3/(2*n) + 1/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\begin{cases} -\frac{bf^af^{bx^n}nx^3x^n\log(f)}{3n+9} + \frac{f^af^{bx^n}nx^3}{3n+9} + \frac{3f^af^{bx^n}x^3}{3n+9} & \text{for } n \neq -3 \\ \int f^{a+\frac{b}{x^3}}x^2\,dx & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b*x**n)*x**2,x)
```

```
[Out] Piecewise((-b*f**a*f**(b*x**n)*n*x**3*x**n*log(f)/(3*n + 9) + f**a*f**(b*x*
*n)*n*x**3/(3*n + 9) + 3*f**a*f**(b*x**n)*x**3/(3*n + 9), Ne(n, -3)), (Inte
gral(f**(a + b/x**3)*x**2, x), True))
```

3.177 $\int f^{a+bx^n} x \, dx$

Optimal. Leaf size=39

$$-\frac{x^2 f^a \left(-b \log(f) x^n\right)^{-2/n} \Gamma\left(\frac{2}{n}, -b x^n \log(f)\right)}{n}$$

[Out] -f^a*x^2*GAMMA(2/n,-b*x^n*ln(f))/n/((-b*x^n*ln(f))^(2/n))

Rubi [A] time = 0.01, antiderivative size = 39, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {2218}

$$-\frac{x^2 f^a \left(-b \log(f) x^n\right)^{-2/n} \text{Gamma}\left(\frac{2}{n}, -b \log(f) x^n\right)}{n}$$

Antiderivative was successfully verified.

[In] Int[f^(a + b*x^n)*x,x]

[Out] -((f^a*x^2*Gamma[2/n, -(b*x^n*Log[f])])/(n*(-(b*x^n*Log[f]))^(2/n)))

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+bx^n} x \, dx = -\frac{f^a x^2 \Gamma\left(\frac{2}{n}, -b x^n \log(f)\right) \left(-b x^n \log(f)\right)^{-2/n}}{n}$$

Mathematica [A] time = 0.01, size = 39, normalized size = 1.00

$$-\frac{x^2 f^a \left(-b \log(f) x^n\right)^{-2/n} \Gamma\left(\frac{2}{n}, -b x^n \log(f)\right)}{n}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^n)*x,x]
[Out] -((f^a*x^2*Gamma[2/n, -(b*x^n*Log[f])])/(n*(-(b*x^n*Log[f]))^(2/n)))
```

fricas [F] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(f^{bx^n+a}x, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x,x, algorithm="fricas")
[Out] integral(f^(b*x^n + a)*x, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{bx^n+a}x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x,x, algorithm="giac")
[Out] integrate(f^(b*x^n + a)*x, x)
```

maple [F] time = 0.06, size = 0, normalized size = 0.00

$$\int x\,f^{b\,x^n+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^n+a)*x,x)
[Out] int(f^(b*x^n+a)*x,x)
```

maxima [A] time = 1.08, size = 41, normalized size = 1.05

$$-\frac{f^a x^2 \Gamma\left(\frac{2}{n}, -bx^n \log(f)\right)}{\left(-bx^n \log(f)\right)^{\frac{2}{n}} n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x,x, algorithm="maxima")
[Out] -f^a*x^2*gamma(2/n, -b*x^n*log(f))/((-b*x^n*log(f))^(2/n)*n)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.03

$$\int f^{a+b\,x^n}\,x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^n)*x,x)
[Out] int(f^(a + b*x^n)*x, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\begin{cases} -\frac{bf^a f^{bx^n} nx^2 x^n \log{(f)}}{2n+4} + \frac{f^a f^{bx^n} nx^2}{2n+4} + \frac{2f^a f^{bx^n} x^2}{2n+4} & \text{for}\ n \neq -2 \\ \int f^{a+\frac{b}{x^2}} x\,dx & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b*x**n)*x,x)
[Out] Piecewise((-b*f**a*f**(b*x**n)*n*x**2*x**n*log(f)/(2*n + 4) + f**a*f**(b*x*
*n)*n*x**2/(2*n + 4) + 2*f**a*f**(b*x**n)*x**2/(2*n + 4), Ne(n, -2)), (Inte
gral(f**(a + b/x**2)*x, x), True))
```

3.178 $\int f^{a+bx^n}\,dx$

Optimal. Leaf size=35

$$-\frac{xf^a\left(-b\log(f)x^n\right)^{-1/n}\Gamma\left(\frac{1}{n},-bx^n\log(f)\right)}{n}$$

```
[Out] -f^a*x*GAMMA(1/n,-b*x^n*ln(f))/n/((-b*x^n*ln(f))^(1/n))
```

Rubi [A] time = 0.00, antiderivative size = 35, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2208}

$$-\frac{xf^a\left(-b\log(f)x^n\right)^{-1/n}\text{Gamma}\left(\frac{1}{n},-b\log(f)x^n\right)}{n}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^n),x]
```

```
[Out] -((f^a*x*Gamma[n^(-1), -(b*x^n*Log[f])])/(n*(-(b*x^n*Log[f]))^n^(-1)))
```

Rule 2208

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> -Simp[(F^a
*(c + d*x)*Gamma[1/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x)^n*Log[F
]))^(1/n)), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rubi steps

$$\int f^{a+bx^n}\,dx=-\frac{f^ax\Gamma\left(\frac{1}{n},-bx^n\log(f)\right)\left(-bx^n\log(f)\right)^{-1/n}}{n}$$

Mathematica [A] time = 0.00, size = 35, normalized size = 1.00

$$-\frac{xf^a\left(-b\log(f)x^n\right)^{-1/n}\Gamma\left(\frac{1}{n},-bx^n\log(f)\right)}{n}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^n),x]
```

```
[Out] -((f^a*x*Gamma[n^(-1), -(b*x^n*Log[f])])/(n*(-(b*x^n*Log[f]))^n^(-1)))
```

fricas [F] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(f^{bx^n+a}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n),x, algorithm="fricas")
[Out] integral(f^(b*x^n + a), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{bx^n+a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n),x, algorithm="giac")
[Out] integrate(f^(b*x^n + a), x)
```

maple [F] time = 0.05, size = 0, normalized size = 0.00

$$\int f^{b\,x^n+a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^n+a),x)
[Out] int(f^(b*x^n+a),x)
```

maxima [A] time = 1.09, size = 35, normalized size = 1.00

$$-\frac{f^a x\Gamma\left(\frac{1}{n}, -bx^n\log(f)\right)}{\left(-bx^n\log(f)\right)^{\left(\frac{1}{n}\right)} n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n),x, algorithm="maxima")
[Out] -f^a*x*gamma(1/n, -b*x^n*log(f))/((-b*x^n*log(f))^(1/n)*n)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.03

$$\int f^{a+b\,x^n}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^n),x)
```

```
[Out] int(f^(a + b*x^n), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\begin{cases} -\frac{bf^a f^{bx^n} nxx^n \log(f)}{n+1} + \frac{f^a f^{bx^n} nx}{n+1} + \frac{f^a f^{bx^n} x}{n+1} & \text{for } n \neq -1 \\ \int f^{a+\frac{b}{x}}\, dx & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b*x**n),x)
```

```
[Out] Piecewise((-b*f**a*f**(b*x**n)*n*x*x**n*log(f)/(n + 1) + f**a*f**(b*x**n)*n
*x/(n + 1) + f**a*f**(b*x**n)*x/(n + 1), Ne(n, -1)), (Integral(f**(a + b/x)
, x), True))
```

3.179 $\int \frac{f^{a+bx^n}}{x} \, dx$

Optimal. Leaf size=15

$$\frac{f^a \text{Ei}\left(bx^n \log(f)\right)}{n}$$

```
[Out] f^a*Ei(b*x^n*ln(f))/n
```

Rubi [A] time = 0.02, antiderivative size = 15, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2210}

$$\frac{f^a \text{Ei}\left(bx^n \log(f)\right)}{n}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^n)/x,x]
```

```
[Out] (f^a*ExpIntegralEi[b*x^n*Log[f]])/n
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+bx^n}}{x} \, dx = \frac{f^a \text{Ei}\left(bx^n \log(f)\right)}{n}$$

Mathematica [A] time = 0.00, size = 15, normalized size = 1.00

$$\frac{f^a \text{Ei}\left(bx^n \log(f)\right)}{n}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^n)/x,x]
```

```
[Out] (f^a*ExpIntegralEi[b*x^n*Log[f]])/n
```

fricas [A] time = 0.41, size = 15, normalized size = 1.00

$$\frac{f^a \mathrm{Ei}\left(bx^n \log(f)\right)}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)/x,x, algorithm="fricas")
[Out] f^a*Ei(b*x^n*log(f))/n
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{bx^n+a}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)/x,x, algorithm="giac")
[Out] integrate(f^(b*x^n + a)/x, x)
```

maple [A] time = 0.21, size = 19, normalized size = 1.27

$$-\frac{f^a\,\mathrm{Ei}\left(1,-b\,x^n\ln(f)\right)}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^n+a)/x,x)
[Out] -1/n*f^a*Ei(1,-b*x^n*ln(f))
```

maxima [A] time = 0.94, size = 15, normalized size = 1.00

$$\frac{f^a \mathrm{Ei}\left(bx^n \log(f)\right)}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)/x,x, algorithm="maxima")
[Out] f^a*Ei(b*x^n*log(f))/n
```

mupad [F] time = 0.00, size = -1, normalized size = -0.07

$$\int \frac{f^{a+b\,x^n}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^n)/x,x)
```

```
[Out] int(f^(a + b*x^n)/x, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+bx^n}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b*x**n)/x,x)
```

```
[Out] Integral(f**(a + b*x**n)/x, x)
```

3.180 $\int \frac{f^{a+bx^n}}{x^2} dx$

Optimal. Leaf size=37

$$-\frac{f^a \left(-b \log(f) x^n\right)^{\frac{1}{n}} \Gamma\left(-\frac{1}{n}, -b x^n \log(f)\right)}{n x}$$

```
[Out] -f^a*GAMMA(-1/n,-b*x^n*ln(f))*(-b*x^n*ln(f))^(1/n)/n/x
```

Rubi [A] time = 0.02, antiderivative size = 37, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2218}

$$-\frac{f^a \left(-b \log(f) x^n\right)^{\frac{1}{n}} \text{Gamma}\left(-\frac{1}{n}, -b \log(f) x^n\right)}{n x}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^n)/x^2,x]
```

```
[Out] -((f^a*Gamma[-n^(-1), -(b*x^n*Log[f])]*(-(b*x^n*Log[f]))^n^(-1))/(n*x))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+bx^n}}{x^2} dx = -\frac{f^a \Gamma\left(-\frac{1}{n}, -b x^n \log(f)\right) \left(-b x^n \log(f)\right)^{\frac{1}{n}}}{n x}$$

Mathematica [A] time = 0.00, size = 37, normalized size = 1.00

$$-\frac{f^a \left(-b \log(f) x^n\right)^{\frac{1}{n}} \Gamma\left(-\frac{1}{n}, -b x^n \log(f)\right)}{n x}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^n)/x^2,x]
[Out] -((f^a*Gamma[-n^(-1), -(b*x^n*Log[f])]*(-(b*x^n*Log[f]))^n^(-1))/(n*x))
```

fricas [F] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{f^{bx^n+a}}{x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)/x^2,x, algorithm="fricas")
[Out] integral(f^(b*x^n + a)/x^2, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{bx^n+a}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)/x^2,x, algorithm="giac")
[Out] integrate(f^(b*x^n + a)/x^2, x)
```

maple [F] time = 0.06, size = 0, normalized size = 0.00

$$\int \frac{f^{b\,x^n+a}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^n+a)/x^2,x)
[Out] int(f^(b*x^n+a)/x^2,x)
```

maxima [A] time = 1.23, size = 37, normalized size = 1.00

$$-\frac{\left(-bx^n\log(f)\right)^{\left(\frac{1}{n}\right)} f^a\Gamma\left(-\frac{1}{n}, -bx^n\log(f)\right)}{nx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)/x^2,x, algorithm="maxima")
```

```
[Out] -(-b*x^n*log(f))^(1/n)*f^a*gamma(-1/n, -b*x^n*log(f))/(n*x)
```

mupad [B] time = 3.53, size = 52, normalized size = 1.41

$$-\frac{f^a\,\mathrm{e}^{\frac{b\,x^n\,\ln(f)}{2}}\,\mathrm{M}_{\frac{1}{2\,n}+\frac{1}{2},-\frac{1}{2\,n}}\left(b\,x^n\,\ln(f)\right)\,\left(b\,x^n\,\ln(f)\right)^{\frac{1}{2\,n}-\frac{1}{2}}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^n)/x^2,x)
```

```
[Out] -(f^a*exp((b*x^n*log(f))/2)*whittakerM(1/(2*n) + 1/2, -1/(2*n), b*x^n*log(f
))*(b*x^n*log(f))^(1/(2*n) - 1/2))/x
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\begin{cases} \frac{bf^a f^{bx^n} nx^n \log(f)}{nx-x} - \frac{f^a f^{bx^n} n}{nx-x} + \frac{f^a f^{bx^n}}{nx-x} & \text{for}\ n \neq 1 \\ \int \frac{f^{a+bx}}{x^2}\, dx & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b*x**n)/x**2,x)
```

```
[Out] Piecewise((b*f**a*f**(b*x**n)*n*x**n*log(f)/(n*x - x) - f**a*f**(b*x**n)*n/
(n*x - x) + f**a*f**(b*x**n)/(n*x - x), Ne(n, 1)), (Integral(f**(a + b*x)/x
**2, x), True))
```

3.181 $\int \frac{f^{a+bx^n}}{x^3} dx$

Optimal. Leaf size=39

$$-\frac{f^a \left(-b \log(f) x^n\right)^{2/n} \Gamma\left(-\frac{2}{n}, -b x^n \log(f)\right)}{n x^2}$$

```
[Out] -f^a*GAMMA(-2/n,-b*x^n*ln(f))*(-b*x^n*ln(f))^(2/n)/n/x^2
```

Rubi [A] time = 0.02, antiderivative size = 39, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {2218}

$$-\frac{f^a \left(-b \log(f) x^n\right)^{2/n} \text{Gamma}\left(-\frac{2}{n}, -b \log(f) x^n\right)}{n x^2}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^n)/x^3,x]
```

```
[Out] -((f^a*Gamma[-2/n, -(b*x^n*Log[f])]*(-(b*x^n*Log[f]))^(2/n))/(n*x^2))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+bx^n}}{x^3} dx = -\frac{f^a \Gamma\left(-\frac{2}{n}, -b x^n \log(f)\right) \left(-b x^n \log(f)\right)^{2/n}}{n x^2}$$

Mathematica [A] time = 0.00, size = 39, normalized size = 1.00

$$-\frac{f^a \left(-b \log(f) x^n\right)^{2/n} \Gamma\left(-\frac{2}{n}, -b x^n \log(f)\right)}{n x^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^n)/x^3,x]
[Out] -((f^a*Gamma[-2/n, -(b*x^n*Log[f])]*(-(b*x^n*Log[f]))^(2/n))/(n*x^2))
```

fricas [F] time = 0.40, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{f^{bx^n+a}}{x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)/x^3,x, algorithm="fricas")
[Out] integral(f^(b*x^n + a)/x^3, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{bx^n+a}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)/x^3,x, algorithm="giac")
[Out] integrate(f^(b*x^n + a)/x^3, x)
```

maple [F] time = 0.04, size = 0, normalized size = 0.00

$$\int \frac{f^{b\,x^n+a}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^n+a)/x^3,x)
[Out] int(f^(b*x^n+a)/x^3,x)
```

maxima [A] time = 1.16, size = 39, normalized size = 1.00

$$-\frac{\left(-bx^n\log(f)\right)^{\frac{2}{n}} f^a\Gamma\left(-\frac{2}{n}, -bx^n\log(f)\right)}{nx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)/x^3,x, algorithm="maxima")
[Out] -(-b*x^n*log(f))^(2/n)*f^a*gamma(-2/n, -b*x^n*log(f))/(n*x^2)
```

mupad [B] time = 3.52, size = 48, normalized size = 1.23

$$-\frac{f^a\,\mathrm{e}^{\frac{b\,x^n\,\ln(f)}{2}}\,\mathrm{M}_{\frac{1}{n}+\frac{1}{2},-\frac{1}{n}}\left(b\,x^n\,\ln(f)\right)\,\left(b\,x^n\,\ln(f)\right)^{\frac{1}{n}-\frac{1}{2}}}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^n)/x^3,x)
```

```
[Out] -(f^a*exp((b*x^n*log(f))/2)*whittakerM(1/n + 1/2, -1/n, b*x^n*log(f))*(b*x^
n*log(f))^(1/n - 1/2))/(2*x^2)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\begin{cases} \frac{bf^af^{bx^n}nx^n\log(f)}{2nx^2-4x^2} - \frac{f^af^{bx^n}n}{2nx^2-4x^2} + \frac{2f^af^{bx^n}}{2nx^2-4x^2} & \text{for } n \neq 2 \\ \int \frac{f^{a+bx^2}}{x^3}\,dx & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b*x**n)/x**3,x)
```

```
[Out] Piecewise((b*f**a*f**(b*x**n)*n*x**n*log(f)/(2*n*x**2 - 4*x**2) - f**a*f**(
b*x**n)*n/(2*n*x**2 - 4*x**2) + 2*f**a*f**(b*x**n)/(2*n*x**2 - 4*x**2), Ne(
n, 2)), (Integral(f**(a + b*x**2)/x**3, x), True))
```

3.182 $\int \frac{f^{a+bx^n}}{x^4}\,dx$

Optimal. Leaf size=39

$$-\frac{f^a\left(-b\log(f)x^n\right)^{3/n}\Gamma\left(-\frac{3}{n},-bx^n\log(f)\right)}{nx^3}$$

```
[Out] -f^a*GAMMA(-3/n,-b*x^n*ln(f))*(-b*x^n*ln(f))^(3/n)/n/x^3
```

Rubi [A] time = 0.02, antiderivative size = 39, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2218}

$$-\frac{f^a\left(-b\log(f)x^n\right)^{3/n}\text{Gamma}\left(-\frac{3}{n},-b\log(f)x^n\right)}{nx^3}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^n)/x^4,x]
```

```
[Out] -((f^a*Gamma[-3/n, -(b*x^n*Log[f])]*(-(b*x^n*Log[f]))^(3/n))/(n*x^3))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+bx^n}}{x^4}\,dx = -\frac{f^a\Gamma\left(-\frac{3}{n},-bx^n\log(f)\right)\left(-bx^n\log(f)\right)^{3/n}}{nx^3}$$

Mathematica [A] time = 0.00, size = 39, normalized size = 1.00

$$-\frac{f^a\left(-b\log(f)x^n\right)^{3/n}\Gamma\left(-\frac{3}{n},-bx^n\log(f)\right)}{nx^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^n)/x^4,x]
[Out] -((f^a*Gamma[-3/n, -(b*x^n*Log[f])]*(-(b*x^n*Log[f]))^(3/n))/(n*x^3))
```

fricas [F] time = 0.40, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{f^{bx^n+a}}{x^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)/x^4,x, algorithm="fricas")
[Out] integral(f^(b*x^n + a)/x^4, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{bx^n+a}}{x^4}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)/x^4,x, algorithm="giac")
[Out] integrate(f^(b*x^n + a)/x^4, x)
```

maple [F] time = 0.04, size = 0, normalized size = 0.00

$$\int \frac{f^{b\,x^n+a}}{x^4}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^n+a)/x^4,x)
[Out] int(f^(b*x^n+a)/x^4,x)
```

maxima [A] time = 1.14, size = 39, normalized size = 1.00

$$-\frac{\left(-bx^n \log(f)\right)^{\frac{3}{n}} f^a \Gamma\left(-\frac{3}{n}, -bx^n \log(f)\right)}{nx^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)/x^4,x, algorithm="maxima")
[Out] -(-b*x^n*log(f))^(3/n)*f^a*gamma(-3/n, -b*x^n*log(f))/(n*x^3)
```

mupad [B] time = 3.48, size = 52, normalized size = 1.33

$$-\frac{f^a\,\mathrm{e}^{\frac{b\,x^n\,\ln(f)}{2}}\,\mathrm{M}_{\frac{3}{2\,n}+\frac{1}{2},-\frac{3}{2\,n}}\left(b\,x^n\,\ln(f)\right)\,\left(b\,x^n\,\ln(f)\right)^{\frac{3}{2\,n}-\frac{1}{2}}}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^n)/x^4,x)
```

```
[Out] -(f^a*exp((b*x^n*log(f))/2)*whittakerM(3/(2*n) + 1/2, -3/(2*n), b*x^n*log(f
))*(b*x^n*log(f))^(3/(2*n) - 1/2))/(3*x^3)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\begin{cases} \frac{bf^a f^{bx^n} nx^n \log{(f)}}{3nx^3-9x^3} - \frac{f^a f^{bx^n} n}{3nx^3-9x^3} + \frac{3f^a f^{bx^n}}{3nx^3-9x^3} & \text{for}\: n \neq 3 \\ \int \frac{f^{a+bx^3}}{x^4}\, dx & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b*x**n)/x**4,x)
```

```
[Out] Piecewise((b*f**a*f**(b*x**n)*n*x**n*log(f)/(3*n*x**3 - 9*x**3) - f**a*f**(
b*x**n)*n/(3*n*x**3 - 9*x**3) + 3*f**a*f**(b*x**n)/(3*n*x**3 - 9*x**3), Ne(
n, 3)), (Integral(f**(a + b*x**3)/x**4, x), True))
```

3.183 $\int f^{a+bx^n} x^{-1+3n}\,dx$

Optimal. Leaf size=71

$$\frac{2f^{a+bx^n}}{b^3n\log^3(f)}-\frac{2x^nf^{a+bx^n}}{b^2n\log^2(f)}+\frac{x^{2n}f^{a+bx^n}}{bn\log(f)}$$

```
[Out] 2*f^(a+b*x^n)/b^3/n/ln(f)^3-2*f^(a+b*x^n)*x^n/b^2/n/ln(f)^2+f^(a+b*x^n)*x^(
2*n)/b/n/ln(f)
```

Rubi [A] time = 0.08, antiderivative size = 71, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118, Rules used = {2213, 2209}

$$-\frac{2x^nf^{a+bx^n}}{b^2n\log^2(f)}+\frac{2f^{a+bx^n}}{b^3n\log^3(f)}+\frac{x^{2n}f^{a+bx^n}}{bn\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^n)*x^(-1 + 3*n),x]
```

```
[Out] (2*f^(a + b*x^n))/(b^3*n*Log[f]^3) - (2*f^(a + b*x^n)*x^n)/(b^2*n*Log[f]^2)
 + (f^(a + b*x^n)*x^(2*n))/(b*n*Log[f])
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2213

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^Simplify[m - n]*
F^(a + b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && Integer
Q[2*Simplify[(m + 1)/n]] && LtQ[0, Simplify[(m + 1)/n], 5] &&  !RationalQ[m
] && SumSimplerQ[m, -n]
```

Rubi steps

$$\int f^{a+bx^n}x^{-1+3n}\,dx=\frac{f^{a+bx^n}x^{2n}}{bn\log(f)}-\frac{2\int f^{a+bx^n}x^{-1+2n}\,dx}{b\log(f)}$$
$$=-\frac{2f^{a+bx^n}x^n}{b^2n\log^2(f)}+\frac{f^{a+bx^n}x^{2n}}{bn\log(f)}+\frac{2\int f^{a+bx^n}x^{-1+n}\,dx}{b^2\log^2(f)}$$
$$=\frac{2f^{a+bx^n}}{b^3n\log^3(f)}-\frac{2f^{a+bx^n}x^n}{b^2n\log^2(f)}+\frac{f^{a+bx^n}x^{2n}}{bn\log(f)}$$

Mathematica [C] time = 0.00, size = 24, normalized size = 0.34

$$\frac{f^a\Gamma\left(3,-bx^n\log(f)\right)}{b^3n\log^3(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^n)*x^(-1 + 3*n),x]
[Out] (f^a*Gamma[3, -(b*x^n*Log[f])])/(b^3*n*Log[f]^3)
```

fricas [A] time = 0.41, size = 47, normalized size = 0.66

$$\frac{\left(b^2x^{2\,n}\log(f)^2-2\,bx^n\log(f)+2\right)e^{\left(bx^n\log(f)+a\log(f)\right)}}{b^3n\log(f)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1+3*n),x, algorithm="fricas")
[Out] (b^2*x^(2*n)*log(f)^2 - 2*b*x^n*log(f) + 2)*e^(b*x^n*log(f) + a*log(f))/(b^
3*n*log(f)^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{bx^n+a}x^{3\,n-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1+3*n),x, algorithm="giac")
[Out] integrate(f^(b*x^n + a)*x^(3*n - 1), x)
```

maple [A] time = 0.02, size = 44, normalized size = 0.62

$$\frac{\left(b^{2}x^{2n}\ln(f)^{2}-2b\,x^{n}\ln(f)+2\right)f^{b\,x^{n}+a}}{b^{3}n\ln(f)^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^n+a)*x^(-1+3*n),x)
```

```
[Out] ((x^n)^2*b^2*ln(f)^2-2*b*x^n*ln(f)+2)/b^3/ln(f)^3/n*f^(b*x^n+a)
```

maxima [A] time = 0.69, size = 51, normalized size = 0.72

$$\frac{\left(b^{2}f^{a}x^{2\,n}\log(f)^{2}-2\,bf^{a}x^{n}\log(f)+2\,f^{a}\right)f^{bx^{n}}}{b^{3}n\log(f)^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1+3*n),x, algorithm="maxima")
```

```
[Out] (b^2*f^a*x^(2*n)*log(f)^2 - 2*b*f^a*x^n*log(f) + 2*f^a)*f^(b*x^n)/(b^3*n*lo
g(f)^3)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int f^{a+b\,x^{n}}\,x^{3\,n-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^n)*x^(3*n - 1),x)
```

```
[Out] int(f^(a + b*x^n)*x^(3*n - 1), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b*x**n)*x**(-1+3*n),x)
```

```
[Out] Timed out
```

3.184 $\int f^{a+bx^n} x^{-1+2n}\,dx$

Optimal. Leaf size=45

$$\frac{x^n f^{a+bx^n}}{bn\log(f)}-\frac{f^{a+bx^n}}{b^2n\log^2(f)}$$

[Out] -f^(a+b*x^n)/b^2/n/ln(f)^2+f^(a+b*x^n)*x^n/b/n/ln(f)

Rubi [A] time = 0.05, antiderivative size = 45, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118, Rules used = {2213, 2209}

$$\frac{x^n f^{a+bx^n}}{bn\log(f)}-\frac{f^{a+bx^n}}{b^2n\log^2(f)}$$

Antiderivative was successfully verified.

[In] Int[f^(a + b*x^n)*x^(-1 + 2*n),x]

[Out] -(f^(a + b*x^n)/(b^2*n*Log[f]^2)) + (f^(a + b*x^n)*x^n)/(b*n*Log[f])

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2213

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^Simplify[m - n]*
F^(a + b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && Integer
Q[2*Simplify[(m + 1)/n]] && LtQ[0, Simplify[(m + 1)/n], 5] &&  !RationalQ[m
] && SumSimplerQ[m, -n]
```

Rubi steps

$$\begin{aligned}\int f^{a+bx^n} x^{-1+2n}\,dx &= \frac{f^{a+bx^n}x^n}{bn\log(f)}-\frac{\int f^{a+bx^n}x^{-1+n}\,dx}{b\log(f)}\\ &= -\frac{f^{a+bx^n}}{b^2n\log^2(f)}+\frac{f^{a+bx^n}x^n}{bn\log(f)}\end{aligned}$$

Mathematica [C] time = 0.01, size = 25, normalized size = 0.56

$$-\frac{f^a\Gamma\left(2,-bx^n\log(f)\right)}{b^2n\log^2(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^n)*x^(-1 + 2*n),x]
[Out] -((f^a*Gamma[2, -(b*x^n*Log[f])])/(b^2*n*Log[f]^2))
```

fricas [A] time = 0.42, size = 33, normalized size = 0.73

$$\frac{\left(bx^n\log(f)-1\right)e^{\left(bx^n\log(f)+a\log(f)\right)}}{b^2n\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1+2*n),x, algorithm="fricas")
[Out] (b*x^n*log(f) - 1)*e^(b*x^n*log(f) + a*log(f))/(b^2*n*log(f)^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{bx^n+a}x^{2n-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1+2*n),x, algorithm="giac")
[Out] integrate(f^(b*x^n + a)*x^(2*n - 1), x)
```

maple [A] time = 0.05, size = 56, normalized size = 1.24

$$\frac{e^{n\ln(x)}e^{\left(b\,e^{n\ln(x)}+a\right)\ln(f)}}{bn\ln(f)}-\frac{e^{\left(b\,e^{n\ln(x)}+a\right)\ln(f)}}{b^2n\ln(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^n+a)*x^(-1+2*n),x)
[Out] 1/ln(f)/b/n*exp(n*ln(x))*exp((a+b*exp(n*ln(x)))*ln(f))-1/ln(f)^2/b^2/n*exp(
(a+b*exp(n*ln(x)))*ln(f))
```

maxima [A] time = 0.78, size = 34, normalized size = 0.76

$$\frac{\left(bf^ax^n\log(f)-f^a\right)f^{bx^n}}{b^2n\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1+2*n),x, algorithm="maxima")
```

```
[Out] (b*f^a*x^n*log(f) - f^a)*f^(b*x^n)/(b^2*n*log(f)^2)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int f^{a+b\,x^n}\,x^{2\,n-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^n)*x^(2*n - 1),x)
```

```
[Out] int(f^(a + b*x^n)*x^(2*n - 1), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b*x**n)*x**(-1+2*n),x)
```

```
[Out] Timed out
```

3.185 $\int f^{a+bx^n}x^{-1+n}\,dx$

Optimal. Leaf size=20

$$\frac{f^{a+bx^n}}{bn\log(f)}$$

[Out] f^(a+b*x^n)/b/n/ln(f)

Rubi [A] time = 0.02, antiderivative size = 20, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067, Rules used = {2209}

$$\frac{f^{a+bx^n}}{bn\log(f)}$$

Antiderivative was successfully verified.

[In] Int[f^(a + b*x^n)*x^(-1 + n),x]

[Out] f^(a + b*x^n)/(b*n*Log[f])

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rubi steps

$$\int f^{a+bx^n}x^{-1+n}\,dx=\frac{f^{a+bx^n}}{bn\log(f)}$$

Mathematica [A] time = 0.00, size = 20, normalized size = 1.00

$$\frac{f^{a+bx^n}}{bn\log(f)}$$

Antiderivative was successfully verified.

[In] Integrate[f^(a + b*x^n)*x^(-1 + n),x]

[Out] f^(a + b*x^n)/(b*n*Log[f])

fricas [A] time = 0.42, size = 24, normalized size = 1.20

$$\frac{e^{\left(bx^n \log(f) + a \log(f)\right)}}{bn \log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1+n),x, algorithm="fricas")
[Out] e^(b*x^n*log(f) + a*log(f))/(b*n*log(f))
```

giac [A] time = 0.22, size = 20, normalized size = 1.00

$$\frac{f^{bx^n+a}}{bn \log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1+n),x, algorithm="giac")
[Out] f^(b*x^n + a)/(b*n*log(f))
```

maple [A] time = 0.04, size = 25, normalized size = 1.25

$$\frac{\mathrm{e}^{\left(b\,\mathrm{e}^{n \ln(x)}+a\right) \ln(f)}}{bn \ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^n+a)*x^(n-1),x)
[Out] 1/ln(f)/b/n*exp((b*exp(n*ln(x))+a)*ln(f))
```

maxima [A] time = 0.66, size = 20, normalized size = 1.00

$$\frac{f^{bx^n+a}}{bn \log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1+n),x, algorithm="maxima")
[Out] f^(b*x^n + a)/(b*n*log(f))
```

mupad [B] time = 3.50, size = 20, normalized size = 1.00

$$\frac{f^{a+b\,x^n}}{b\,n\,\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^n)*x^(n - 1),x)
```

```
[Out] f^(a + b*x^n)/(b*n*log(f))
```

sympy [A] time = 67.28, size = 39, normalized size = 1.95

$$\begin{cases} \log(x) & \text{for } b = 0 \wedge f = 1 \wedge n = 0 \\ f^{a+b}\log(x) & \text{for } n = 0 \\ \frac{f^a x^n}{n} & \text{for } b = 0 \\ \frac{x^n}{n} & \text{for } f = 1 \\ \frac{f^a f^{bx^n}}{bn\log(f)} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b*x**n)*x**(-1+n),x)
```

```
[Out] Piecewise((log(x), Eq(b, 0) & Eq(f, 1) & Eq(n, 0)), (f**(a + b)*log(x), Eq(
n, 0)), (f**a*x**n/n, Eq(b, 0)), (x**n/n, Eq(f, 1)), (f**a*f**(b*x**n)/(b*n
*log(f)), True))
```

3.186 $\int \frac{f^{a+bx^n}}{x}\,dx$

Optimal. Leaf size=15

$$\frac{f^a \text{Ei}\left(bx^n \log(f)\right)}{n}$$

```
[Out] f^a*Ei(b*x^n*ln(f))/n
```

Rubi [A] time = 0.02, antiderivative size = 15, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2210}

$$\frac{f^a \text{Ei}\left(bx^n \log(f)\right)}{n}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^n)/x,x]
```

```
[Out] (f^a*ExpIntegralEi[b*x^n*Log[f]])/n
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{f^{a+bx^n}}{x}\,dx = \frac{f^a \text{Ei}\left(bx^n \log(f)\right)}{n}$$

Mathematica [A] time = 0.00, size = 15, normalized size = 1.00

$$\frac{f^a \text{Ei}\left(bx^n \log(f)\right)}{n}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^n)/x,x]
```

```
[Out] (f^a*ExpIntegralEi[b*x^n*Log[f]])/n
```

fricas [A]   time = 0.41, size = 15, normalized size = 1.00

$$\frac{f^a \mathrm{Ei}\left(bx^n \log(f)\right)}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)/x,x, algorithm="fricas")
[Out] f^a*Ei(b*x^n*log(f))/n
```

giac [F]   time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{bx^n+a}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)/x,x, algorithm="giac")
[Out] integrate(f^(b*x^n + a)/x, x)
```

maple [A]   time = 0.03, size = 19, normalized size = 1.27

$$-\frac{f^a \,\mathrm{Ei}\left(1, -b\,x^n \ln(f)\right)}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^n+a)/x,x)
[Out] -1/n*f^a*Ei(1,-b*x^n*ln(f))
```

maxima [A]   time = 0.90, size = 15, normalized size = 1.00

$$\frac{f^a \mathrm{Ei}\left(bx^n \log(f)\right)}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)/x,x, algorithm="maxima")
[Out] f^a*Ei(b*x^n*log(f))/n
```

mupad [F]   time = 0.00, size = -1, normalized size = -0.07

$$\int \frac{f^{a+b\,x^n}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^n)/x,x)
```

```
[Out] int(f^(a + b*x^n)/x, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+bx^n}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b*x**n)/x,x)
```

```
[Out] Integral(f**(a + b*x**n)/x, x)
```

3.187 $\int f^{a+bx^n} x^{-1-n}\,dx$

Optimal. Leaf size=38

$$\frac{bf^a\log(f)\text{Ei}\left(bx^n\log(f)\right)}{n}-\frac{x^{-n}f^{a+bx^n}}{n}$$

[Out] -f^(a+b*x^n)/n/(x^n)+b*f^a*Ei(b*x^n*ln(f))*ln(f)/n

Rubi [A] time = 0.05, antiderivative size = 38, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118, Rules used = {2215, 2210}

$$\frac{bf^a\log(f)\text{Ei}\left(bx^n\log(f)\right)}{n}-\frac{x^{-n}f^{a+bx^n}}{n}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^n)*x^(-1 - n),x]
```

```
[Out] -(f^(a + b*x^n)/(n*x^n)) + (b*f^a*ExpIntegralEi[b*x^n*Log[f]]*Log[f])/n
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2215

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^Simplify[m + n]*F^(a + b*(c
 + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && IntegerQ[2*Simplif
y[(m + 1)/n]] && LtQ[-4, Simplify[(m + 1)/n], 5] &&  !RationalQ[m] && SumSi
mplerQ[m, n]
```

Rubi steps

$$\begin{aligned}\int f^{a+bx^n}x^{-1-n}\,dx&=-\frac{f^{a+bx^n}x^{-n}}{n}+(b\log(f))\int\frac{f^{a+bx^n}}{x}\,dx\\&=-\frac{f^{a+bx^n}x^{-n}}{n}+\frac{bf^a\text{Ei}\left(bx^n\log(f)\right)\log(f)}{n}\end{aligned}$$

Mathematica [A] time = 0.00, size = 20, normalized size = 0.53

$$\frac{bf^a\log(f)\Gamma\left(-1,-bx^n\log(f)\right)}{n}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^n)*x^(-1 - n),x]
[Out] (b*f^a*Gamma[-1, -(b*x^n*Log[f])]*Log[f])/n
```

fricas [A] time = 0.41, size = 43, normalized size = 1.13

$$\frac{bf^ax^n\text{Ei}\left(bx^n\log(f)\right)\log(f)-e^{\left(bx^n\log(f)+a\log(f)\right)}}{nx^n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1-n),x, algorithm="fricas")
[Out] (b*f^a*x^n*Ei(b*x^n*log(f))*log(f) - e^(b*x^n*log(f) + a*log(f)))/(n*x^n)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{bx^n+a}x^{-n-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1-n),x, algorithm="giac")
[Out] integrate(f^(b*x^n + a)*x^(-n - 1), x)
```

maple [A] time = 0.12, size = 43, normalized size = 1.13

$$-\frac{b\,f^a\,\text{Ei}\left(1,-b\,x^n\ln(f)\right)\ln(f)}{n}-\frac{f^af^{b\,x^n}x^{-n}}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^n+a)*x^(-1-n),x)
[Out] -1/n*f^(b*x^n)*f^a/(x^n)-1/n*ln(f)*b*f^a*Ei(1,-b*x^n*ln(f))
```

maxima [A] time = 1.03, size = 20, normalized size = 0.53

$$\frac{bf^a\Gamma\left(-1,-bx^n\log(f)\right)\log(f)}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1-n),x, algorithm="maxima")
```

```
[Out] b*f^a*gamma(-1, -b*x^n*log(f))*log(f)/n
```

mupad [F] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{f^{a+b\,x^n}}{x^{n+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^n)/x^(n + 1),x)
```

```
[Out] int(f^(a + b*x^n)/x^(n + 1), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b*x**n)*x**(-1-n),x)
```

```
[Out] Timed out
```

3.188 $\int f^{a+bx^n} x^{-1-2n}\, dx$

Optimal. Leaf size=71

$$\frac{b^2 f^a \log^2(f)\text{Ei}\left(bx^n \log(f)\right)}{2n} - \frac{x^{-2n} f^{a+bx^n}}{2n} - \frac{b\log(f)x^{-n} f^{a+bx^n}}{2n}$$

```
[Out] -1/2*f^(a+b*x^n)/n/(x^(2*n))-1/2*b*f^(a+b*x^n)*ln(f)/n/(x^n)+1/2*b^2*f^a*Ei
(b*x^n*ln(f))*ln(f)^2/n
```

Rubi [A] time = 0.08, antiderivative size = 71, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118, Rules used = {2215, 2210}

$$\frac{b^2 f^a \log^2(f)\text{Ei}\left(bx^n \log(f)\right)}{2n} - \frac{x^{-2n} f^{a+bx^n}}{2n} - \frac{b\log(f)x^{-n} f^{a+bx^n}}{2n}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^n)*x^(-1 - 2*n),x]
```

```
[Out] -f^(a + b*x^n)/(2*n*x^(2*n)) - (b*f^(a + b*x^n)*Log[f])/(2*n*x^n) + (b^2*f^
a*ExpIntegralEi[b*x^n*Log[f]]*Log[f]^2)/(2*n)
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2215

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^Simplify[m + n]*F^(a + b*(c
 + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && IntegerQ[2*Simplif
y[(m + 1)/n]] && LtQ[-4, Simplify[(m + 1)/n], 5] &&  !RationalQ[m] && SumSi
mplerQ[m, n]
```

Rubi steps

$$\int f^{a+bx^n}x^{-1-2n}\,dx = -\frac{f^{a+bx^n}x^{-2n}}{2n} + \frac{1}{2}(b\log(f))\int f^{a+bx^n}x^{-1-n}\,dx$$
$$= -\frac{f^{a+bx^n}x^{-2n}}{2n} - \frac{bf^{a+bx^n}x^{-n}\log(f)}{2n} + \frac{1}{2}\left(b^2\log^2(f)\right)\int \frac{f^{a+bx^n}}{x}\,dx$$
$$= -\frac{f^{a+bx^n}x^{-2n}}{2n} - \frac{bf^{a+bx^n}x^{-n}\log(f)}{2n} + \frac{b^2f^a\mathrm{Ei}\left(bx^n\log(f)\right)\log^2(f)}{2n}$$

Mathematica [A] time = 0.00, size = 25, normalized size = 0.35

$$-\frac{b^2f^a\log^2(f)\Gamma\left(-2,-bx^n\log(f)\right)}{n}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^n)*x^(-1 - 2*n),x]
```

```
[Out] -((b^2*f^a*Gamma[-2, -(b*x^n*Log[f])]*Log[f]^2)/n)
```

fricas [A] time = 0.41, size = 61, normalized size = 0.86

$$\frac{b^2f^ax^{2\,n}\mathrm{Ei}\left(bx^n\log(f)\right)\log(f)^2-\left(bx^n\log(f)+1\right)e^{\left(bx^n\log(f)+a\log(f)\right)}}{2\,nx^{2\,n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1-2*n),x, algorithm="fricas")
```

```
[Out] 1/2*(b^2*f^a*x^(2*n)*Ei(b*x^n*log(f))*log(f)^2 - (b*x^n*log(f) + 1)*e^(b*x^
n*log(f) + a*log(f)))/(n*x^(2*n))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{bx^n+a}x^{-2\,n-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1-2*n),x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^n + a)*x^(-2*n - 1), x)
```

maple [A] time = 0.13, size = 70, normalized size = 0.99

$$-\frac{b^2f^a\,\mathrm{Ei}\left(1,-b\,x^n\ln(f)\right)\ln(f)^2}{2n}-\frac{b\,f^af^{b\,x^n}x^{-n}\ln(f)}{2n}-\frac{f^af^{b\,x^n}x^{-2n}}{2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^n+a)*x^(-1-2*n),x)
```

```
[Out] -1/2/n*f^(b*x^n)*f^a/(x^n)^2-1/2/n*ln(f)*b*f^(b*x^n)*f^a/(x^n)-1/2/n*ln(f)^
2*b^2*f^a*Ei(1,-b*x^n*ln(f))
```

maxima [A] time = 1.01, size = 25, normalized size = 0.35

$$-\frac{b^2 f^a \Gamma\left(-2, -bx^n \log(f)\right) \log(f)^2}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1-2*n),x, algorithm="maxima")
```

```
[Out] -b^2*f^a*gamma(-2, -b*x^n*log(f))*log(f)^2/n
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{f^{a+b\,x^n}}{x^{2\,n+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^n)/x^(2*n + 1),x)
```

```
[Out] int(f^(a + b*x^n)/x^(2*n + 1), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b*x**n)*x**(-1-2*n),x)
```

```
[Out] Timed out
```

3.189 $\int f^{a+bx^n} x^{-1+\frac{5n}{2}} \, dx$

Optimal. Leaf size=104

$$\frac{3\sqrt{\pi}\, f^a \text{erfi}\left(\sqrt{b}\,\sqrt{\log(f)}\, x^{n/2}\right)}{4b^{5/2} n \log^{\frac{5}{2}}(f)} - \frac{3x^{n/2} f^{a+bx^n}}{2b^2 n \log^2(f)} + \frac{x^{3n/2} f^{a+bx^n}}{bn \log(f)}$$

```
[Out] -3/2*f^(a+b*x^n)*x^(1/2*n)/b^2/n/ln(f)^2+f^(a+b*x^n)*x^(3/2*n)/b/n/ln(f)+3/
4*f^a*erfi(x^(1/2*n)*b^(1/2)*ln(f)^(1/2))*Pi^(1/2)/b^(5/2)/n/ln(f)^(5/2)
```

Rubi [A] time = 0.11, antiderivative size = 104, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {2213, 2211, 2204}

$$\frac{3\sqrt{\pi}\, f^a \text{Erfi}\left(\sqrt{b}\,\sqrt{\log(f)}\, x^{n/2}\right)}{4b^{5/2} n \log^{\frac{5}{2}}(f)} - \frac{3x^{n/2} f^{a+bx^n}}{2b^2 n \log^2(f)} + \frac{x^{3n/2} f^{a+bx^n}}{bn \log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^n)*x^(-1 + (5*n)/2),x]
```

```
[Out] (3*f^a*Sqrt[Pi]*Erfi[Sqrt[b]*x^(n/2)*Sqrt[Log[f]]])/(4*b^(5/2)*n*Log[f]^(5/
2)) - (3*f^(a + b*x^n)*x^(n/2))/(2*b^2*n*Log[f]^2) + (f^(a + b*x^n)*x^((3*n
)/2))/(b*n*Log[f])
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2211

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2213

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^Simplify[m - n]*
F^(a + b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && Integer
Q[2*Simplify[(m + 1)/n]] && LtQ[0, Simplify[(m + 1)/n], 5] &&  !RationalQ[m
```

```
] && SumSimplerQ[m, -n]
```

Rubi steps

$$\begin{aligned}
\int f^{a+bx^n} x^{-1+\frac{5n}{2}}\,dx &= \frac{f^{a+bx^n} x^{3n/2}}{bn\log(f)} - \frac{3\int f^{a+bx^n} x^{-1+\frac{3n}{2}}\,dx}{2b\log(f)}\\
&= -\frac{3f^{a+bx^n} x^{n/2}}{2b^2 n\log^2(f)} + \frac{f^{a+bx^n} x^{3n/2}}{bn\log(f)} + \frac{3\int f^{a+bx^n} x^{\frac{1}{2}(-2+n)}\,dx}{4b^2\log^2(f)}\\
&= -\frac{3f^{a+bx^n} x^{n/2}}{2b^2 n\log^2(f)} + \frac{f^{a+bx^n} x^{3n/2}}{bn\log(f)} + \frac{3\,\text{Subst}\left(\int f^{a+bx^2}\,dx, x, x^{1+\frac{1}{2}(-2+n)}\right)}{2b^2 n\log^2(f)}\\
&= \frac{3f^a\sqrt{\pi}\,\text{erfi}\left(\sqrt{b}\,x^{n/2}\sqrt{\log(f)}\right)}{4b^{5/2} n\log^{\frac{5}{2}}(f)} - \frac{3f^{a+bx^n} x^{n/2}}{2b^2 n\log^2(f)} + \frac{f^{a+bx^n} x^{3n/2}}{bn\log(f)}
\end{aligned}$$

Mathematica [A] time = 0.01, size = 39, normalized size = 0.38

$$-\frac{f^a x^{5n/2}\Gamma\left(\frac{5}{2}, -bx^n\log(f)\right)}{n\left(-b\log(f)x^n\right)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^n)*x^(-1 + (5*n)/2),x]
[Out] -((f^a*x^((5*n)/2)*Gamma[5/2, -(b*x^n*Log[f])])/(n*(-(b*x^n*Log[f]))^(5/2))
)
```

fricas [A] time = 0.44, size = 82, normalized size = 0.79

$$-\frac{3\sqrt{\pi}\sqrt{-b\log(f)}\,f^a\,\text{erf}\left(\sqrt{-b\log(f)}\,x^{\frac{1}{2}n}\right) - 2\left(2\,b^2 x^{\frac{3}{2}n}\log(f)^2 - 3\,bx^{\frac{1}{2}n}\log(f)\right)e^{\left(bx^n\log(f)+a\log(f)\right)}}{4\,b^3 n\log(f)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1+5/2*n),x, algorithm="fricas")
[Out] -1/4*(3*sqrt(pi)*sqrt(-b*log(f))*f^a*erf(sqrt(-b*log(f))*x^(1/2*n)) - 2*(2*
b^2*x^(3/2*n)*log(f)^2 - 3*b*x^(1/2*n)*log(f))*e^(b*x^n*log(f) + a*log(f)))
/(b^3*n*log(f)^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{bx^n+a} x^{\frac{5}{2}n-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1+5/2*n),x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^n + a)*x^(5/2*n - 1), x)
```

maple [A] time = 0.11, size = 96, normalized size = 0.92

$$\frac{f^a f^{b\,x^n} x^{\frac{3n}{2}}}{bn\ln(f)} - \frac{3f^a f^{b\,x^n} x^{\frac{n}{2}}}{2b^2 n\ln(f)^2} + \frac{3\sqrt{\pi}\;f^a\operatorname{erf}\left(\sqrt{-b\ln(f)}\;x^{\frac{n}{2}}\right)}{4\sqrt{-b\ln(f)}\;b^2 n\ln(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^n+a)*x^(-1+5/2*n),x)
```

```
[Out] f^a/n*f^(b*x^n)*(x^(1/2*n))^3/b/ln(f)-3/2*f^a/n/ln(f)^2/b^2*x^(1/2*n)*f^(b*
x^n)+3/4*f^a/n/ln(f)^2/b^2*Pi^(1/2)/(-b*ln(f))^(1/2)*erf((-b*ln(f))^(1/2)*x
^(1/2*n))
```

maxima [A] time = 1.21, size = 33, normalized size = 0.32

$$-\frac{f^a x^{\frac{5}{2}n}\Gamma\left(\frac{5}{2}, -bx^n\log(f)\right)}{\left(-bx^n\log(f)\right)^{\frac{5}{2}} n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1+5/2*n),x, algorithm="maxima")
```

```
[Out] -f^a*x^(5/2*n)*gamma(5/2, -b*x^n*log(f))/((-b*x^n*log(f))^(5/2)*n)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int f^{a+b\,x^n}\,x^{\frac{5\,n}{2}-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^n)*x^((5*n)/2 - 1),x)
```

```
[Out] int(f^(a + b*x^n)*x^((5*n)/2 - 1), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b*x**n)*x**(-1+5/2*n),x)
[Out] Timed out
```

3.190 $\int f^{a+bx^n}x^{-1+\frac{3n}{2}}\,dx$

Optimal. Leaf size=74

$$\frac{x^{n/2}f^{a+bx^n}}{bn\log(f)}-\frac{\sqrt{\pi}\,f^a\text{erfi}\left(\sqrt{b}\,\sqrt{\log(f)}\,x^{n/2}\right)}{2b^{3/2}n\log^{\frac{3}{2}}(f)}$$

```
[Out] f^(a+b*x^n)*x^(1/2*n)/b/n/ln(f)-1/2*f^a*erfi(x^(1/2*n)*b^(1/2)*ln(f)^(1/2))
*Pi^(1/2)/b^(3/2)/n/ln(f)^(3/2)
```

Rubi [A] time = 0.07, antiderivative size = 74, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {2213, 2211, 2204}

$$\frac{x^{n/2}f^{a+bx^n}}{bn\log(f)}-\frac{\sqrt{\pi}\,f^a\text{Erfi}\left(\sqrt{b}\,\sqrt{\log(f)}\,x^{n/2}\right)}{2b^{3/2}n\log^{\frac{3}{2}}(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^n)*x^(-1 + (3*n)/2),x]
```

```
[Out] -(f^a*Sqrt[Pi]*Erfi[Sqrt[b]*x^(n/2)*Sqrt[Log[f]]])/(2*b^(3/2)*n*Log[f]^(3/2
)) + (f^(a + b*x^n)*x^(n/2))/(b*n*Log[f])
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2211

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2213

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^Simplify[m - n]*
F^(a + b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && Integer
Q[2*Simplify[(m + 1)/n]] && LtQ[0, Simplify[(m + 1)/n], 5] &&  !RationalQ[m
```

```
] && SumSimplerQ[m, -n]
```

Rubi steps

$$\int f^{a+bx^n}x^{-1+\frac{3n}{2}}\,dx = \frac{f^{a+bx^n}x^{n/2}}{bn\log(f)} - \frac{\int f^{a+bx^n}x^{\frac{1}{2}(-2+n)}\,dx}{2b\log(f)}$$
$$= \frac{f^{a+bx^n}x^{n/2}}{bn\log(f)} - \frac{\text{Subst}\left(\int f^{a+bx^2}\,dx, x, x^{1+\frac{1}{2}(-2+n)}\right)}{bn\log(f)}$$
$$= -\frac{f^a\sqrt{\pi}\,\text{erfi}\left(\sqrt{b}\,x^{n/2}\sqrt{\log(f)}\right)}{2b^{3/2}n\log^{\frac{3}{2}}(f)} + \frac{f^{a+bx^n}x^{n/2}}{bn\log(f)}$$

Mathematica [A] time = 0.01, size = 39, normalized size = 0.53

$$-\frac{f^a x^{3n/2}\Gamma\left(\frac{3}{2}, -bx^n\log(f)\right)}{n\left(-b\log(f)x^n\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^n)*x^(-1 + (3*n)/2),x]
```

```
[Out] -((f^a*x^((3*n)/2)*Gamma[3/2, -(b*x^n*Log[f])])/(n*(-(b*x^n*Log[f]))^(3/2))
)
```

fricas [A] time = 0.43, size = 64, normalized size = 0.86

$$\frac{2\,bx^{\frac{1}{2}\,n}e^{\left(bx^n\log(f)+a\log(f)\right)}\log(f) + \sqrt{\pi}\,\sqrt{-b\log(f)}\,f^a\,\text{erf}\left(\sqrt{-b\log(f)}\,x^{\frac{1}{2}\,n}\right)}{2\,b^2n\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1+3/2*n),x, algorithm="fricas")
```

```
[Out] 1/2*(2*b*x^(1/2*n)*e^(b*x^n*log(f) + a*log(f))*log(f) + sqrt(pi)*sqrt(-b*lo
g(f))*f^a*erf(sqrt(-b*log(f))*x^(1/2*n)))/(b^2*n*log(f)^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{bx^n+a}x^{\frac{3}{2}\,n-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1+3/2*n),x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^n + a)*x^(3/2*n - 1), x)
```

maple [A] time = 0.09, size = 67, normalized size = 0.91

$$\frac{f^{a} f^{b x^{n}} x^{\frac{n}{2}}}{b n \ln(f)}-\frac{\sqrt{\pi}\, f^{a} \operatorname{erf}\left(\sqrt{-b \ln(f)}\, x^{\frac{n}{2}}\right)}{2 \sqrt{-b \ln(f)}\, b n \ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^n+a)*x^(-1+3/2*n),x)
```

```
[Out] 1/n*f^a/ln(f)/b*x^(1/2*n)*f^(b*x^n)-1/2/n*f^a/ln(f)/b*Pi^(1/2)/(-b*ln(f))^(
1/2)*erf((-b*ln(f))^(1/2)*x^(1/2*n))
```

maxima [A] time = 1.07, size = 33, normalized size = 0.45

$$-\frac{f^{a} x^{\frac{3}{2}n} \Gamma\left(\frac{3}{2}, -b x^{n} \log(f)\right)}{\left(-b x^{n} \log(f)\right)^{\frac{3}{2}} n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1+3/2*n),x, algorithm="maxima")
```

```
[Out] -f^a*x^(3/2*n)*gamma(3/2, -b*x^n*log(f))/((-b*x^n*log(f))^(3/2)*n)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int f^{a+b x^{n}}\, x^{\frac{3n}{2}-1}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^n)*x^((3*n)/2 - 1),x)
```

```
[Out] int(f^(a + b*x^n)*x^((3*n)/2 - 1), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b*x**n)*x**(-1+3/2*n),x)
```

```
[Out] Timed out
```

3.191 $\int f^{a+bx^n} x^{-1+\frac{n}{2}} \, dx$

Optimal. Leaf size=43

$$\frac{\sqrt{\pi} f^a \text{erfi}\left(\sqrt{b} \sqrt{\log(f)} x^{n/2}\right)}{\sqrt{b} n \sqrt{\log(f)}}$$

```
[Out] f^a*erfi(x^(1/2*n)*b^(1/2)*ln(f)^(1/2))*Pi^(1/2)/n/b^(1/2)/ln(f)^(1/2)
```

Rubi [A] time = 0.04, antiderivative size = 43, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105, Rules used = {2211, 2204}

$$\frac{\sqrt{\pi} f^a \text{Erfi}\left(\sqrt{b} \sqrt{\log(f)} x^{n/2}\right)}{\sqrt{b} n \sqrt{\log(f)}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^n)*x^(-1 + n/2),x]
```

```
[Out] (f^a*Sqrt[Pi]*Erfi[Sqrt[b]*x^(n/2)*Sqrt[Log[f]]])/(Sqrt[b]*n*Sqrt[Log[f]])
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2211

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rubi steps

$$\begin{aligned} \int f^{a+bx^n} x^{-1+\frac{n}{2}} \, dx &= \frac{2 \operatorname{Subst}\left(\int f^{a+bx^2} \, dx, x, x^{n/2}\right)}{n} \\ &= \frac{f^a \sqrt{\pi} \operatorname{erfi}\left(\sqrt{b} x^{n/2} \sqrt{\log(f)}\right)}{\sqrt{b} n \sqrt{\log(f)}} \end{aligned}$$

Mathematica [A] time = 0.01, size = 43, normalized size = 1.00

$$\frac{\sqrt{\pi}\, f^a \text{erfi}\left(\sqrt{b}\,\sqrt{\log(f)}\, x^{n/2}\right)}{\sqrt{b}\, n \sqrt{\log(f)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^n)*x^(-1 + n/2),x]
```

```
[Out] (f^a*Sqrt[Pi]*Erfi[Sqrt[b]*x^(n/2)*Sqrt[Log[f]]])/(Sqrt[b]*n*Sqrt[Log[f]])
```

fricas [A] time = 0.42, size = 42, normalized size = 0.98

$$-\frac{\sqrt{\pi}\,\sqrt{-b\log(f)}\, f^a \operatorname{erf}\left(\sqrt{-b\log(f)}\, x x^{\frac{1}{2}n-1}\right)}{bn\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1+1/2*n),x, algorithm="fricas")
```

```
[Out] -sqrt(pi)*sqrt(-b*log(f))*f^a*erf(sqrt(-b*log(f))*x*x^(1/2*n - 1))/(b*n*log
(f))
```

giac [A] time = 0.28, size = 33, normalized size = 0.77

$$-\frac{\sqrt{\pi}\, f^a \operatorname{erf}\left(-\sqrt{-b\log(f)}\,\sqrt{x^n}\right)}{\sqrt{-b\log(f)}\, n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1+1/2*n),x, algorithm="giac")
```

```
[Out] -sqrt(pi)*f^a*erf(-sqrt(-b*log(f))*sqrt(x^n))/(sqrt(-b*log(f))*n)
```

maple [A] time = 0.10, size = 32, normalized size = 0.74

$$\frac{\sqrt{\pi}\, f^a \operatorname{erf}\left(\sqrt{-b\ln(f)}\, x^{\frac{n}{2}}\right)}{\sqrt{-b\ln(f)}\, n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^n+a)*x^(-1+1/2*n),x)
```

```
[Out] 1/n*f^a*Pi^(1/2)/(-b*ln(f))^(1/2)*erf((-b*ln(f))^(1/2)*x^(1/2*n))
```

maxima [A] time = 0.94, size = 38, normalized size = 0.88

$$\frac{\sqrt{\pi} f^{a} x^{\frac{1}{2} n} \left(\operatorname{erf}\left(\sqrt{-b x^{n} \log(f)}\right) - 1\right)}{\sqrt{-b x^{n} \log(f)}\, n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1+1/2*n),x, algorithm="maxima")
```

```
[Out] sqrt(pi)*f^a*x^(1/2*n)*(erf(sqrt(-b*x^n*log(f))) - 1)/(sqrt(-b*x^n*log(f))*
n)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int f^{a+b\,x^n}\,x^{\frac{n}{2}-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^n)*x^(n/2 - 1),x)
```

```
[Out] int(f^(a + b*x^n)*x^(n/2 - 1), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b*x**n)*x**(-1+1/2*n),x)
```

```
[Out] Timed out
```

3.192 $\int f^{a+bx^n} x^{-1-\frac{n}{2}}\,dx$

Optimal. Leaf size=66

$$\frac{2\sqrt{\pi}\,\sqrt{b}\,f^a\sqrt{\log(f)}\,\text{erfi}\left(\sqrt{b}\,\sqrt{\log(f)}\,x^{n/2}\right)}{n}-\frac{2x^{-n/2}f^{a+bx^n}}{n}$$

```
[Out] -2*f^(a+b*x^n)/n/(x^(1/2*n))+2*f^a*erfi(x^(1/2*n)*b^(1/2)*ln(f)^(1/2))*b^(1
/2)*Pi^(1/2)*ln(f)^(1/2)/n
```

Rubi [A] time = 0.07, antiderivative size = 66, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {2215, 2211, 2204}

$$\frac{2\sqrt{\pi}\,\sqrt{b}\,f^a\sqrt{\log(f)}\,\text{Erfi}\left(\sqrt{b}\,\sqrt{\log(f)}\,x^{n/2}\right)}{n}-\frac{2x^{-n/2}f^{a+bx^n}}{n}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^n)*x^(-1 - n/2),x]
```

```
[Out] (-2*f^(a + b*x^n))/(n*x^(n/2)) + (2*Sqrt[b]*f^a*Sqrt[Pi]*Erfi[Sqrt[b]*x^(n/
2)*Sqrt[Log[f]]]*Sqrt[Log[f]])/n
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2211

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2215

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^Simplify[m + n]*F^(a + b*(c
 + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && IntegerQ[2*Simplif
y[(m + 1)/n]] && LtQ[-4, Simplify[(m + 1)/n], 5] &&  !RationalQ[m] && SumSi
mplerQ[m, n]
```

Rubi steps

$$\int f^{a+bx^n}x^{-1-\frac{n}{2}}\,dx = -\frac{2f^{a+bx^n}x^{-n/2}}{n} + (2b\log(f))\int f^{a+bx^n}x^{\frac{1}{2}(-2+n)}\,dx$$
$$= -\frac{2f^{a+bx^n}x^{-n/2}}{n} + \frac{(4b\log(f))\,\mathrm{Subst}\left(\int f^{a+bx^2}\,dx, x, x^{1+\frac{1}{2}(-2+n)}\right)}{n}$$
$$= -\frac{2f^{a+bx^n}x^{-n/2}}{n} + \frac{2\sqrt{b}\,f^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,x^{n/2}\sqrt{\log(f)}\right)\sqrt{\log(f)}}{n}$$

Mathematica [A] time = 0.01, size = 39, normalized size = 0.59

$$-\frac{f^a x^{-n/2}\sqrt{-b\log(f)x^n}\,\Gamma\left(-\frac{1}{2}, -bx^n\log(f)\right)}{n}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^n)*x^(-1 - n/2),x]
```

```
[Out] -((f^a*Gamma[-1/2, -(b*x^n*Log[f])]*Sqrt[-(b*x^n*Log[f])])/(n*x^(n/2)))
```

fricas [A] time = 0.42, size = 83, normalized size = 1.26

$$-\frac{2\left(\sqrt{\pi}\,\sqrt{-b\log(f)}\,f^a\,\mathrm{erf}\left(\frac{\sqrt{-b\log(f)}}{xx^{-\frac{1}{2}n-1}}\right) + xx^{-\frac{1}{2}n-1}e^{\left(\frac{ax^2x^{-n-2}\log(f)+b\log(f)}{x^2x^{-n-2}}\right)}\right)}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1-1/2*n),x, algorithm="fricas")
```

```
[Out] -2*(sqrt(pi)*sqrt(-b*log(f))*f^a*erf(sqrt(-b*log(f))/(x*x^(-1/2*n - 1))) +
x*x^(-1/2*n - 1)*e^((a*x^2*x^(-n - 2)*log(f) + b*log(f))/(x^2*x^(-n - 2))))
/n
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{bx^n+a}x^{-\frac{1}{2}n-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1-1/2*n),x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^n + a)*x^(-1/2*n - 1), x)
```

maple [A] time = 0.12, size = 59, normalized size = 0.89

$$\frac{2\sqrt{\pi}\, b\, f^{a}\, \mathrm{erf}\left(\sqrt{-b\ln(f)}\, x^{\frac{n}{2}}\right)\ln(f)}{\sqrt{-b\ln(f)}\, n}-\frac{2 f^{a} f^{b\,x^{n}} x^{-\frac{n}{2}}}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^n+a)*x^(-1-1/2*n),x)
[Out] -2/n*f^a/(x^(1/2*n))*f^(b*x^n)+2/n*f^a*ln(f)*b*Pi^(1/2)/(-b*ln(f))^(1/2)*er
f((-b*ln(f))^(1/2)*x^(1/2*n))
```

maxima [A] time = 0.98, size = 35, normalized size = 0.53

$$-\frac{\sqrt{-bx^{n}\log(f)}\, f^{a}\Gamma\left(-\frac{1}{2}, -bx^{n}\log(f)\right)}{nx^{\frac{1}{2}\,n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1-1/2*n),x, algorithm="maxima")
[Out] -sqrt(-b*x^n*log(f))*f^a*gamma(-1/2, -b*x^n*log(f))/(n*x^(1/2*n))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{f^{a+b\,x^n}}{x^{\frac{n}{2}+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^n)/x^(n/2 + 1),x)
[Out] int(f^(a + b*x^n)/x^(n/2 + 1), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b*x**n)*x**(-1-1/2*n),x)
[Out] Timed out
```

3.193 $\int f^{a+bx^n} x^{-1-\frac{3n}{2}} \, dx$

Optimal. Leaf size=96

$$\frac{4\sqrt{\pi}\, b^{3/2} f^a \log^{\frac{3}{2}}(f)\text{erfi}\left(\sqrt{b}\,\sqrt{\log(f)}\, x^{n/2}\right)}{3n} - \frac{2x^{-3n/2} f^{a+bx^n}}{3n} - \frac{4b\log(f)x^{-n/2} f^{a+bx^n}}{3n}$$

```
[Out] -2/3*f^(a+b*x^n)/n/(x^(3/2*n))-4/3*b*f^(a+b*x^n)*ln(f)/n/(x^(1/2*n))+4/3*b^
(3/2)*f^a*erfi(x^(1/2*n)*b^(1/2)*ln(f)^(1/2))*ln(f)^(3/2)*Pi^(1/2)/n
```

Rubi [A] time = 0.10, antiderivative size = 96, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {2215, 2211, 2204}

$$\frac{4\sqrt{\pi}\, b^{3/2} f^a \log^{\frac{3}{2}}(f)\text{Erfi}\left(\sqrt{b}\,\sqrt{\log(f)}\, x^{n/2}\right)}{3n} - \frac{2x^{-3n/2} f^{a+bx^n}}{3n} - \frac{4b\log(f)x^{-n/2} f^{a+bx^n}}{3n}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^n)*x^(-1 - (3*n)/2),x]
```

```
[Out] (-2*f^(a + b*x^n))/(3*n*x^((3*n)/2)) - (4*b*f^(a + b*x^n)*Log[f])/(3*n*x^(n
/2)) + (4*b^(3/2)*f^a*Sqrt[Pi]*Erfi[Sqrt[b]*x^(n/2)*Sqrt[Log[f]]]*Log[f]^(3
/2))/(3*n)
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2211

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2215

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^Simplify[m + n]*F^(a + b*(c
 + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && IntegerQ[2*Simplif
y[(m + 1)/n]] && LtQ[-4, Simplify[(m + 1)/n], 5] &&  !RationalQ[m] && SumSi
```

```
mplerQ[m, n]
```

Rubi steps

$$
\begin{aligned}
\int f^{a+bx^n} x^{-1-\frac{3n}{2}}\,dx &= -\frac{2f^{a+bx^n}x^{-3n/2}}{3n}+\frac{1}{3}(2b\log(f))\int f^{a+bx^n}x^{-1-\frac{n}{2}}\,dx\\
&= -\frac{2f^{a+bx^n}x^{-3n/2}}{3n}-\frac{4bf^{a+bx^n}x^{-n/2}\log(f)}{3n}+\frac{1}{3}\left(4b^2\log^2(f)\right)\int f^{a+bx^n}x^{\frac{1}{2}(-2+n)}\,dx\\
&= -\frac{2f^{a+bx^n}x^{-3n/2}}{3n}-\frac{4bf^{a+bx^n}x^{-n/2}\log(f)}{3n}+\frac{\left(8b^2\log^2(f)\right)\operatorname{Subst}\left(\int f^{a+bx^2}\,dx,x,x^{1+\frac{1}{2}(-2+n)}\right)}{3n}\\
&= -\frac{2f^{a+bx^n}x^{-3n/2}}{3n}-\frac{4bf^{a+bx^n}x^{-n/2}\log(f)}{3n}+\frac{4b^{3/2}f^a\sqrt{\pi}\operatorname{erfi}\left(\sqrt{b}\,x^{n/2}\sqrt{\log(f)}\right)\log^{\frac{3}{2}}(f)}{3n}
\end{aligned}
$$

Mathematica [A] time = 0.01, size = 39, normalized size = 0.41

$$
-\frac{f^a x^{-3n/2}\left(-b\log(f)x^n\right)^{3/2}\Gamma\left(-\frac{3}{2},-bx^n\log(f)\right)}{n}
$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^n)*x^(-1 - (3*n)/2),x]
```

```
[Out] -((f^a*Gamma[-3/2, -(b*x^n*Log[f])]*(-(b*x^n*Log[f]))^(3/2))/(n*x^((3*n)/2)
))
```

fricas [F] time = 0.45, size = 0, normalized size = 0.00

$$
\operatorname{integral}\left(f^{bx^n+a}x^{-\frac{3}{2}n-1},x\right)
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1-3/2*n),x, algorithm="fricas")
```

```
[Out] integral(f^(b*x^n + a)*x^(-3/2*n - 1), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$
\int f^{bx^n+a}x^{-\frac{3}{2}n-1}\,dx
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1-3/2*n),x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^n + a)*x^(-3/2*n - 1), x)
```

maple [A] time = 0.10, size = 88, normalized size = 0.92

$$\frac{4\sqrt{\pi}\, b^{2} f^{a} \operatorname{erf}\left(\sqrt{-b\ln(f)}\, x^{\frac{n}{2}}\right)\ln(f)^{2}}{3\sqrt{-b\ln(f)}\, n}-\frac{4b\, f^{a} f^{b\,x^{n}} x^{-\frac{n}{2}} \ln(f)}{3n}-\frac{2 f^{a} f^{b\,x^{n}} x^{-\frac{3n}{2}}}{3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^n+a)*x^(-1-3/2*n),x)
```

```
[Out] -2/3*f^a/n/(x^(1/2*n))^3*f^(b*x^n)-4/3*f^a/n*ln(f)*b/(x^(1/2*n))*f^(b*x^n)+
4/3*f^a/n*ln(f)^2*b^2*Pi^(1/2)/(-b*ln(f))^(1/2)*erf((-b*ln(f))^(1/2)*x^(1/2
*n))
```

maxima [A] time = 1.04, size = 35, normalized size = 0.36

$$-\frac{\left(-bx^{n}\log(f)\right)^{\frac{3}{2}} f^{a}\Gamma\left(-\frac{3}{2}, -bx^{n}\log(f)\right)}{nx^{\frac{3}{2}n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*x^(-1-3/2*n),x, algorithm="maxima")
```

```
[Out] -(-b*x^n*log(f))^(3/2)*f^a*gamma(-3/2, -b*x^n*log(f))/(n*x^(3/2*n))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{f^{a+b\,x^{n}}}{x^{\frac{3\,n}{2}+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^n)/x^((3*n)/2 + 1),x)
```

```
[Out] int(f^(a + b*x^n)/x^((3*n)/2 + 1), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b*x**n)*x**(-1-3/2*n),x)
```

```
[Out] Timed out
```

3.194 $\int e^{-0.1x}x\,dx$

Optimal. Leaf size=16

$$-10.e^{-0.1x}x-100.e^{-0.1x}$$

```
[Out] -100.*exp(-.1*x)-10.*exp(-.1*x)*x
```

Rubi [A] time = 0.01, antiderivative size = 16, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {2176, 2194}

$$-10.e^{-0.1x}x-100.e^{-0.1x}$$

Antiderivative was successfully verified.

```
[In] Int[x/E^(0.1*x),x]
```

```
[Out] -100./E^(0.1*x) - (10.*x)/E^(0.1*x)
```

Rule 2176

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_.), x_Symbol] :> Simp[((c + d*x)^m*(b*F^(g*(e + f*x)))^n)/(f*g*n*Log[F]),
x] - Dist[(d*m)/(f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*(b*F^(g*(e + f*x)))^n
, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && GtQ[m, 0] && IntegerQ[2*m
] &&  !$UseGamma === True
```

Rule 2194

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rubi steps

$$\begin{aligned}\int e^{-0.1x}x\,dx &= -10.e^{-0.1x}x+10.\int e^{-0.1x}\,dx\\ &= -100.e^{-0.1x}-10.e^{-0.1x}x\end{aligned}$$

Mathematica [A] time = 0.01, size = 11, normalized size = 0.69

$$e^{-0.1x}(-10.x-100.)$$

Antiderivative was successfully verified.

```
[In] Integrate[x/E^(0.1*x),x]
```

```
[Out] (-99.99999999999999 - 10.*x)/E^(0.1*x)
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-.1*x)*x,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >> An error occurred when FriCAS evaluated 'int
egrate(sage0,sage1)':   There are 12 exposed and 10 unexposed library opera
tions named       integrate having 2 argument(s) but none was determined to
 be       applicable. Use HyperDoc Browse, or issue
     )display op integrate      to learn more about the available operation
s. Perhaps       package-calling the operation or using coercions on the ar
guments       will allow you to apply the operation.    Cannot find a defin
ition or applicable library operation named       integrate with argument t
ype(s)                                Expression(Float)
              Variable(x)            Perhaps you should use @ to indicate t
he required return type, or       $ to specify which version of the functio
n you need.
```

giac [A] time = 0.21, size = 10, normalized size = 0.62

$$(-10.0000000000000\,x - 100.000000000000)e^{(-0.100000000000000\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-.1*x)*x,x, algorithm="giac")
```

```
[Out] (-10.0000000000000*x - 100.000000000000)*e^(-0.100000000000000*x)
```

maple [A] time = 0.00, size = 10, normalized size = 0.62

$$-10.0\,(x + 10.0)\,\mathrm{e}^{-0.1000000000x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(-.1*x)*x,x)
```

```
[Out] -10.*(x+10.)*exp(-.1000000000*x)
```

maxima [A] time = 0.52, size = 9, normalized size = 0.56

$$-10\,(x + 10)e^{\left(-\frac{1}{10}\,x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-.1*x)*x,x, algorithm="maxima")
[Out] -10*(x + 10)*e^(-1/10*x)
```

mupad [B] time = 0.03, size = 9, normalized size = 0.56

$$-10\,\mathrm{e}^{-0.1\,x}\,\left(x+10.0\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*exp(-0.1*x),x)
[Out] -10*exp(-0.1*x)*(x + 10.0)
```

sympy [A] time = 0.09, size = 10, normalized size = 0.62

$$1.0\left(-10.0x-100.0\right)e^{-0.1x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-.1*x)*x,x)
[Out] 1.0*(-10.0*x - 100.0)*exp(-0.1*x)
```

3.195 $\int f^{c(a+bx)^2} x^3 \, dx$

Optimal. Leaf size=203

$$-\frac{\sqrt{\pi}\, a^3 \mathrm{erfi}\left(\sqrt{c}\,\sqrt{\log(f)}\,(a+bx)\right)}{2b^4\sqrt{c}\,\sqrt{\log(f)}}+\frac{3a^2 f^{c(a+bx)^2}}{2b^4 c\log(f)}+\frac{3\sqrt{\pi}\, a\mathrm{erfi}\left(\sqrt{c}\,\sqrt{\log(f)}\,(a+bx)\right)}{4b^4c^{3/2}\log^{\frac{3}{2}}(f)}-\frac{f^{c(a+bx)^2}}{2b^4c^2\log^2(f)}+\frac{(a+bx)^2 f^{c(}}{2b^4 c\log(}$$

```
[Out] -1/2*f^(c*(b*x+a)^2)/b^4/c^2/ln(f)^2+3/2*a^2*f^(c*(b*x+a)^2)/b^4/c/ln(f)-3/
2*a*f^(c*(b*x+a)^2)*(b*x+a)/b^4/c/ln(f)+1/2*f^(c*(b*x+a)^2)*(b*x+a)^2/b^4/c
/ln(f)+3/4*a*erfi((b*x+a)*c^(1/2)*ln(f)^(1/2))*Pi^(1/2)/b^4/c^(3/2)/ln(f)^(
3/2)-1/2*a^3*erfi((b*x+a)*c^(1/2)*ln(f)^(1/2))*Pi^(1/2)/b^4/c^(1/2)/ln(f)^(
1/2)
```

Rubi [A] time = 0.23, antiderivative size = 203, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267, Rules used = {2226, 2204, 2209, 2212}

$$-\frac{\sqrt{\pi}\, a^3 \mathrm{Erfi}\left(\sqrt{c}\,\sqrt{\log(f)}\,(a+bx)\right)}{2b^4\sqrt{c}\,\sqrt{\log(f)}}+\frac{3a^2 f^{c(a+bx)^2}}{2b^4 c\log(f)}+\frac{3\sqrt{\pi}\, a\mathrm{Erfi}\left(\sqrt{c}\,\sqrt{\log(f)}\,(a+bx)\right)}{4b^4c^{3/2}\log^{\frac{3}{2}}(f)}-\frac{f^{c(a+bx)^2}}{2b^4c^2\log^2(f)}+\frac{(a+bx)^2 f^{c(}}{2b^4 c\log(}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c*(a + b*x)^2)*x^3,x]
```

```
[Out] -f^(c*(a + b*x)^2)/(2*b^4*c^2*Log[f]^2) + (3*a*Sqrt[Pi]*Erfi[Sqrt[c]*(a + b
*x)*Sqrt[Log[f]]])/(4*b^4*c^(3/2)*Log[f]^(3/2)) + (3*a^2*f^(c*(a + b*x)^2))
/(2*b^4*c*Log[f]) - (3*a*f^(c*(a + b*x)^2)*(a + b*x))/(2*b^4*c*Log[f]) + (f
^(c*(a + b*x)^2)*(a + b*x)^2)/(2*b^4*c*Log[f]) - (a^3*Sqrt[Pi]*Erfi[Sqrt[c]
*(a + b*x)*Sqrt[Log[f]]])/(2*b^4*Sqrt[c]*Sqrt[Log[f]])
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rule 2226

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int f^{c(a+bx)^2}x^3\,dx = \int\left(-\frac{a^3f^{c(a+bx)^2}}{b^3}+\frac{3a^2f^{c(a+bx)^2}(a+bx)}{b^3}-\frac{3af^{c(a+bx)^2}(a+bx)^2}{b^3}+\frac{f^{c(a+bx)^2}(a+bx)^3}{b^3}\right)dx$$
$$=\frac{\int f^{c(a+bx)^2}(a+bx)^3\,dx}{b^3}-\frac{(3a)\int f^{c(a+bx)^2}(a+bx)^2\,dx}{b^3}+\frac{\left(3a^2\right)\int f^{c(a+bx)^2}(a+bx)\,dx}{b^3}-\frac{a^3\int f$$
$$=\frac{3a^2f^{c(a+bx)^2}}{2b^4c\log(f)}-\frac{3af^{c(a+bx)^2}(a+bx)}{2b^4c\log(f)}+\frac{f^{c(a+bx)^2}(a+bx)^2}{2b^4c\log(f)}-\frac{a^3\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{c}\,(a+bx)\sqrt{\log(f)}\right)}{2b^4\sqrt{c}\,\sqrt{\log(f)}}-$$
$$=-\frac{f^{c(a+bx)^2}}{2b^4c^2\log^2(f)}+\frac{3a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{c}\,(a+bx)\sqrt{\log(f)}\right)}{4b^4c^{3/2}\log^{\frac{3}{2}}(f)}+\frac{3a^2f^{c(a+bx)^2}}{2b^4c\log(f)}-\frac{3af^{c(a+bx)^2}(a+bx)}{2b^4c\log(f)}+\frac{f$$

Mathematica [A] time = 0.11, size = 96, normalized size = 0.47

$$\frac{2f^{c(a+bx)^2}\left(c\log(f)\left(a^2-abx+b^2x^2\right)-1\right)+\sqrt{\pi}\,a\sqrt{c}\,\sqrt{\log(f)}\,\left(3-2a^2c\log(f)\right)\mathrm{erfi}\left(\sqrt{c}\,\sqrt{\log(f)}\,(a+bx)\right)}{4b^4c^2\log^2(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c*(a + b*x)^2)*x^3,x]
```

```
[Out] (a*Sqrt[c]*Sqrt[Pi]*Erfi[Sqrt[c]*(a + b*x)*Sqrt[Log[f]]]*Sqrt[Log[f]]*(3 -
2*a^2*c*Log[f]) + 2*f^(c*(a + b*x)^2)*(-1 + c*(a^2 - a*b*x + b^2*x^2)*Log[f
]))/(4*b^4*c^2*Log[f]^2)
```

fricas [A] time = 0.42, size = 113, normalized size = 0.56

$$\frac{\sqrt{\pi}\left(2\,a^{3}c\log(f)-3\,a\right)\sqrt{-b^{2}c\log(f)}\,\operatorname{erf}\left(\frac{\sqrt{-b^{2}c\log(f)}\,(bx+a)}{b}\right)+2\left(\left(b^{3}cx^{2}-ab^{2}cx+a^{2}bc\right)\log(f)-b\right)f^{b^{2}cx^{2}+2\,abcx+a}}{4\,b^{5}c^{2}\log(f)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^2)*x^3,x, algorithm="fricas")
```

```
[Out] 1/4*(sqrt(pi)*(2*a^3*c*log(f) - 3*a)*sqrt(-b^2*c*log(f))*erf(sqrt(-b^2*c*lo
g(f))*(b*x + a)/b) + 2*((b^3*c*x^2 - a*b^2*c*x + a^2*b*c)*log(f) - b)*f^(b^
2*c*x^2 + 2*a*b*c*x + a^2*c))/(b^5*c^2*log(f)^2)
```

giac [A] time = 0.26, size = 136, normalized size = 0.67

$$\frac{\frac{\sqrt{\pi}\left(2\,a^{3}c\log(f)-3\,a\right)\operatorname{erf}\left(-\sqrt{-c\log(f)}\,b\left(x+\frac{a}{b}\right)\right)}{\sqrt{-c\log(f)}\,bc\log(f)}+\frac{2\left(b^{2}c\left(x+\frac{a}{b}\right)^{2}\log(f)-3\,abc\left(x+\frac{a}{b}\right)\log(f)+3\,a^{2}c\log(f)-1\right)e^{\left(b^{2}cx^{2}\log(f)+2\,abcx\log(f)+a^{2}c\log(f)\right)}}{bc^{2}\log(f)^{2}}}{4\,b^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^2)*x^3,x, algorithm="giac")
```

```
[Out] 1/4*(sqrt(pi)*(2*a^3*c*log(f) - 3*a)*erf(-sqrt(-c*log(f))*b*(x + a/b))/(sqr
t(-c*log(f))*b*c*log(f)) + 2*(b^2*c*(x + a/b)^2*log(f) - 3*a*b*c*(x + a/b)*
log(f) + 3*a^2*c*log(f) - 1)*e^(b^2*c*x^2*log(f) + 2*a*b*c*x*log(f) + a^2*c
*log(f))/(b*c^2*log(f)^2))/b^3
```

maple [A] time = 0.09, size = 249, normalized size = 1.23

$$\frac{x^{2}f^{a^{2}c}f^{b^{2}c\,x^{2}}f^{2abcx}}{2b^{2}c\ln(f)}+\frac{\sqrt{\pi}\;a^{3}\operatorname{erf}\left(\frac{ac\ln(f)}{\sqrt{-c\ln(f)}}-\sqrt{-c\ln(f)}\;bx\right)}{2\sqrt{-c\ln(f)}\;b^{4}}-\frac{ax\,f^{a^{2}c}f^{b^{2}c\,x^{2}}f^{2abcx}}{2b^{3}c\ln(f)}+\frac{a^{2}f^{a^{2}c}f^{b^{2}c\,x^{2}}f^{2abcx}}{2b^{4}c\ln(f)}-\frac{3\sqrt{\pi}\;a\operatorname{erf}\left(-\right.}{4\sqrt{-}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(b*x+a)^2)*x^3,x)
```

```
[Out] 1/2/b^2/c/ln(f)*x^2*f^(c*x^2*b^2)*f^(2*a*b*c*x)*f^(a^2*c)-1/2*a/b^3/c/ln(f)
*x*f^(c*x^2*b^2)*f^(2*a*b*c*x)*f^(a^2*c)+1/2*a^2/b^4/c/ln(f)*f^(c*x^2*b^2)*
f^(2*a*b*c*x)*f^(a^2*c)+1/2*a^3/b^4*Pi^(1/2)/(-c*ln(f))^(1/2)*erf(-b*(-c*ln
(f))^(1/2)*x+a*c*ln(f)/(-c*ln(f))^(1/2))-3/4*a/b^4/c/ln(f)*Pi^(1/2)/(-c*ln(
f))^(1/2)*erf(-b*(-c*ln(f))^(1/2)*x+a*c*ln(f)/(-c*ln(f))^(1/2))-1/2/b^4/c^2
/ln(f)^2*f^(c*x^2*b^2)*f^(2*a*b*c*x)*f^(a^2*c)
```

maxima [A] time = 1.70, size = 264, normalized size = 1.30

$$-\frac{\frac{\sqrt{\pi}\left(b^2cx+abc\right)a^3c^3\left(\operatorname{erf}\left(\sqrt{-\frac{\left(b^2cx+abc\right)^2\log(f)}{b^2c}}\right)-1\right)\log(f)^4}{\left(c\log(f)\right)^{\frac{7}{2}}b^4\sqrt{-\frac{\left(b^2cx+abc\right)^2\log(f)}{b^2c}}}-\frac{3a^2c^3f^{\frac{\left(b^2cx+abc\right)^2}{b^2c}}\log(f)^3}{\left(c\log(f)\right)^{\frac{7}{2}}b^3}-\frac{3\left(b^2cx+abc\right)^3ac\Gamma\left(\frac{3}{2},-\frac{\left(b^2cx+abc\right)^2\log(f)}{b^2c}\right)\log(f)^4}{\left(c\log(f)\right)^{\frac{7}{2}}b^6\left(-\frac{\left(b^2cx+abc\right)^2\log(f)}{b^2c}\right)^{\frac{3}{2}}}+\cdots}{2\sqrt{c\log(f)}\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^2)*x^3,x, algorithm="maxima")
```

```
[Out] -1/2*(sqrt(pi)*(b^2*c*x + a*b*c)*a^3*c^3*(erf(sqrt(-(b^2*c*x + a*b*c)^2*log
(f)/(b^2*c))) - 1)*log(f)^4/((c*log(f))^(7/2)*b^4*sqrt(-(b^2*c*x + a*b*c)^2
*log(f)/(b^2*c))) - 3*a^2*c^3*f^((b^2*c*x + a*b*c)^2/(b^2*c))*log(f)^3/((c*
log(f))^(7/2)*b^3) - 3*(b^2*c*x + a*b*c)^3*a*c*gamma(3/2, -(b^2*c*x + a*b*c
)^2*log(f)/(b^2*c))*log(f)^4/((c*log(f))^(7/2)*b^6*(-(b^2*c*x + a*b*c)^2*lo
g(f)/(b^2*c))^(3/2)) + c^2*gamma(2, -(b^2*c*x + a*b*c)^2*log(f)/(b^2*c))*lo
g(f)^2/((c*log(f))^(7/2)*b^3))/(sqrt(c*log(f))*b)
```

mupad [B] time = 3.56, size = 171, normalized size = 0.84

$$\frac{f^{b^2cx^2}f^{a^2c}f^{2abcx}x^2}{2b^2c\ln(f)}-\frac{\sqrt{\pi}\operatorname{erfi}\left(\sqrt{c\ln(f)}\,(a+bx)\right)\left(\frac{a^3}{b^4}-\frac{3a}{2b^4c\ln(f)}\right)}{2\sqrt{c\ln(f)}}+\frac{f^{b^2cx^2}f^{a^2c}f^{2abcx}\left(\frac{a^2c\ln(f)}{2}-\frac{1}{2}\right)}{b^4c^2\ln(f)^2}-\frac{af^{b^2\cdots}}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(a + b*x)^2)*x^3,x)
```

```
[Out] (f^(b^2*c*x^2)*f^(a^2*c)*f^(2*a*b*c*x)*x^2)/(2*b^2*c*log(f)) - (pi^(1/2)*er
fi((c*log(f))^(1/2)*(a + b*x))*(a^3/b^4 - (3*a)/(2*b^4*c*log(f))))/(2*(c*lo
g(f))^(1/2)) + (f^(b^2*c*x^2)*f^(a^2*c)*f^(2*a*b*c*x)*((a^2*c*log(f))/2 - 1
/2))/(b^4*c^2*log(f)^2) - (a*f^(b^2*c*x^2)*f^(a^2*c)*f^(2*a*b*c*x)*x)/(2*b^
3*c*log(f))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{c(a+bx)^2}x^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*(b*x+a)**2)*x**3,x)
```

```
[Out] Integral(f**(c*(a + b*x)**2)*x**3, x)
```

3.196 $\int f^{c(a+bx)^2} x^2\,dx$

Optimal. Leaf size=140

$$\frac{\sqrt{\pi}\,a^2\text{erfi}\left(\sqrt{c}\,\sqrt{\log(f)}\,(a+bx)\right)}{2b^3\sqrt{c}\,\sqrt{\log(f)}}-\frac{\sqrt{\pi}\,\text{erfi}\left(\sqrt{c}\,\sqrt{\log(f)}\,(a+bx)\right)}{4b^3c^{3/2}\log^{\frac{3}{2}}(f)}+\frac{(a+bx)f^{c(a+bx)^2}}{2b^3c\log(f)}-\frac{af^{c(a+bx)^2}}{b^3c\log(f)}$$

```
[Out] -a*f^(c*(b*x+a)^2)/b^3/c/ln(f)+1/2*f^(c*(b*x+a)^2)*(b*x+a)/b^3/c/ln(f)-1/4*
erfi((b*x+a)*c^(1/2)*ln(f)^(1/2))*Pi^(1/2)/b^3/c^(3/2)/ln(f)^(3/2)+1/2*a^2*
erfi((b*x+a)*c^(1/2)*ln(f)^(1/2))*Pi^(1/2)/b^3/c^(1/2)/ln(f)^(1/2)
```

Rubi [A] time = 0.13, antiderivative size = 140, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267, Rules used = {2226, 2204, 2209, 2212}

$$\frac{\sqrt{\pi}\,a^2\text{Erfi}\left(\sqrt{c}\,\sqrt{\log(f)}\,(a+bx)\right)}{2b^3\sqrt{c}\,\sqrt{\log(f)}}-\frac{\sqrt{\pi}\,\text{Erfi}\left(\sqrt{c}\,\sqrt{\log(f)}\,(a+bx)\right)}{4b^3c^{3/2}\log^{\frac{3}{2}}(f)}+\frac{(a+bx)f^{c(a+bx)^2}}{2b^3c\log(f)}-\frac{af^{c(a+bx)^2}}{b^3c\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c*(a + b*x)^2)*x^2,x]
```

```
[Out] -(Sqrt[Pi]*Erfi[Sqrt[c]*(a + b*x)*Sqrt[Log[f]]])/(4*b^3*c^(3/2)*Log[f]^(3/2
)) - (a*f^(c*(a + b*x)^2))/(b^3*c*Log[f]) + (f^(c*(a + b*x)^2)*(a + b*x))/(
2*b^3*c*Log[f]) + (a^2*Sqrt[Pi]*Erfi[Sqrt[c]*(a + b*x)*Sqrt[Log[f]]])/(2*b^
3*Sqrt[c]*Sqrt[Log[f]])
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
```

```
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rule 2226

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\begin{aligned}\int f^{c(a+bx)^2}x^2\,dx &= \int\left(\frac{a^2f^{c(a+bx)^2}}{b^2}-\frac{2af^{c(a+bx)^2}(a+bx)}{b^2}+\frac{f^{c(a+bx)^2}(a+bx)^2}{b^2}\right)dx\\
&= \frac{\int f^{c(a+bx)^2}(a+bx)^2\,dx}{b^2}-\frac{(2a)\int f^{c(a+bx)^2}(a+bx)\,dx}{b^2}+\frac{a^2\int f^{c(a+bx)^2}\,dx}{b^2}\\
&= -\frac{af^{c(a+bx)^2}}{b^3c\log(f)}+\frac{f^{c(a+bx)^2}(a+bx)}{2b^3c\log(f)}+\frac{a^2\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{c}\,(a+bx)\sqrt{\log(f)}\right)}{2b^3\sqrt{c}\,\sqrt{\log(f)}}-\frac{\int f^{c(a+bx)^2}\,dx}{2b^2c\log(f)}\\
&= -\frac{\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{c}\,(a+bx)\sqrt{\log(f)}\right)}{4b^3c^{3/2}\log^{\frac{3}{2}}(f)}-\frac{af^{c(a+bx)^2}}{b^3c\log(f)}+\frac{f^{c(a+bx)^2}(a+bx)}{2b^3c\log(f)}+\frac{a^2\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{c}\,(a+bx)\sqrt{\log(f)}\right)}{2b^3\sqrt{c}\,\sqrt{\log(f)}}\end{aligned}$$

Mathematica [A] time = 0.07, size = 83, normalized size = 0.59

$$\frac{\sqrt{\pi}\,\left(2a^2c\log(f)-1\right)\mathrm{erfi}\left(\sqrt{c}\,\sqrt{\log(f)}\,(a+bx)\right)-2\sqrt{c}\,\sqrt{\log(f)}\,(a-bx)f^{c(a+bx)^2}}{4b^3c^{3/2}\log^{\frac{3}{2}}(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c*(a + b*x)^2)*x^2,x]
```

```
[Out] (-2*Sqrt[c]*f^(c*(a + b*x)^2)*(a - b*x)*Sqrt[Log[f]] + Sqrt[Pi]*Erfi[Sqrt[c
]*(a + b*x)*Sqrt[Log[f]]]*(-1 + 2*a^2*c*Log[f]))/(4*b^3*c^(3/2)*Log[f]^(3/2
))
```

fricas [A] time = 0.42, size = 95, normalized size = 0.68

$$-\frac{\sqrt{\pi}\left(2\,a^2c\log(f)-1\right)\sqrt{-b^2c\log(f)}\ \mathrm{erf}\left(\frac{\sqrt{-b^2c\log(f)}\,(bx+a)}{b}\right)-2\left(b^2cx-abc\right)f^{b^2cx^2+2\,abcx+a^2c}\log(f)}{4\,b^4c^2\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^2)*x^2,x, algorithm="fricas")
```

```
[Out] -1/4*(sqrt(pi)*(2*a^2*c*log(f) - 1)*sqrt(-b^2*c*log(f))*erf(sqrt(-b^2*c*log
(f))*(b*x + a)/b) - 2*(b^2*c*x - a*b*c)*f^(b^2*c*x^2 + 2*a*b*c*x + a^2*c)*l
og(f))/(b^4*c^2*log(f)^2)
```

giac [A] time = 0.25, size = 107, normalized size = 0.76

$$-\frac{\frac{\sqrt{\pi}\left(2\,a^2c\log(f)-1\right)\operatorname{erf}\left(-\sqrt{-c\log(f)}\,b\left(x+\frac{a}{b}\right)\right)}{\sqrt{-c\log(f)}\,bc\log(f)}-\frac{2\left(b\left(x+\frac{a}{b}\right)-2\,a\right)e^{\left(b^2cx^2\log(f)+2\,abcx\log(f)+a^2c\log(f)\right)}}{bc\log(f)}}{4\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^2)*x^2,x, algorithm="giac")
```

```
[Out] -1/4*(sqrt(pi)*(2*a^2*c*log(f) - 1)*erf(-sqrt(-c*log(f))*b*(x + a/b))/(sqrt
(-c*log(f))*b*c*log(f)) - 2*(b*(x + a/b) - 2*a)*e^(b^2*c*x^2*log(f) + 2*a*b
*c*x*log(f) + a^2*c*log(f))/(b*c*log(f)))/b^2
```

maple [A] time = 0.06, size = 168, normalized size = 1.20

$$-\frac{\sqrt{\pi}\;a^2\operatorname{erf}\left(\frac{ac\ln(f)}{\sqrt{-c\ln(f)}}-\sqrt{-c\ln(f)}\;bx\right)}{2\sqrt{-c\ln(f)}\;b^3}+\frac{x\,f^{a^2c}f^{b^2c\,x^2}f^{2abcx}}{2b^2c\ln(f)}-\frac{a\,f^{a^2c}f^{b^2c\,x^2}f^{2abcx}}{2b^3c\ln(f)}+\frac{\sqrt{\pi}\;\operatorname{erf}\left(\frac{ac\ln(f)}{\sqrt{-c\ln(f)}}-\sqrt{-c\ln(f)}\;bx\right)}{4\sqrt{-c\ln(f)}\;b^3c\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(b*x+a)^2)*x^2,x)
```

```
[Out] 1/2/b^2/c/ln(f)*x*f^(b^2*c*x^2)*f^(2*a*b*c*x)*f^(a^2*c)-1/2*a/b^3/c/ln(f)*f
^(b^2*c*x^2)*f^(2*a*b*c*x)*f^(a^2*c)-1/2*a^2/b^3*Pi^(1/2)/(-c*ln(f))^(1/2)*
erf(1/(-c*ln(f))^(1/2)*a*c*ln(f)-(-c*ln(f))^(1/2)*b*x)+1/4/b^3/c/ln(f)*Pi^(
1/2)/(-c*ln(f))^(1/2)*erf(1/(-c*ln(f))^(1/2)*a*c*ln(f)-(-c*ln(f))^(1/2)*b*x
)
```

maxima [A] time = 1.32, size = 218, normalized size = 1.56

$$\frac{\frac{\sqrt{\pi}\left(b^2cx+abc\right)a^2c^2\left(\operatorname{erf}\left(\sqrt{-\frac{\left(b^2cx+abc\right)^2\log(f)}{b^2c}}\right)-1\right)\log(f)^3}{\left(c\log(f)\right)^{\frac{5}{2}}b^3\sqrt{-\frac{\left(b^2cx+abc\right)^2\log(f)}{b^2c}}}-\frac{2\,ac^2f^{\frac{\left(b^2cx+abc\right)^2}{b^2c}}\log(f)^2}{\left(c\log(f)\right)^{\frac{5}{2}}b^2}-\frac{\left(b^2cx+abc\right)^3\Gamma\left(\frac{3}{2},-\frac{\left(b^2cx+abc\right)^2\log(f)}{b^2c}\right)\log(f)^3}{\left(c\log(f)\right)^{\frac{5}{2}}b^5\left(-\frac{\left(b^2cx+abc\right)^2\log(f)}{b^2c}\right)^{\frac{3}{2}}}}{2\sqrt{c\log(f)}\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^2)*x^2,x, algorithm="maxima")
```

```
[Out] 1/2*(sqrt(pi)*(b^2*c*x + a*b*c)*a^2*c^2*(erf(sqrt(-(b^2*c*x + a*b*c)^2*log(
f)/(b^2*c))) - 1)*log(f)^3/((c*log(f))^(5/2)*b^3*sqrt(-(b^2*c*x + a*b*c)^2*
log(f)/(b^2*c))) - 2*a*c^2*f^((b^2*c*x + a*b*c)^2/(b^2*c))*log(f)^2/((c*log
(f))^(5/2)*b^2) - (b^2*c*x + a*b*c)^3*gamma(3/2, -(b^2*c*x + a*b*c)^2*log(f
)/(b^2*c))*log(f)^3/((c*log(f))^(5/2)*b^5*(-(b^2*c*x + a*b*c)^2*log(f)/(b^2
*c))^(3/2)))/(sqrt(c*log(f))*b)
```

mupad [B] time = 3.61, size = 121, normalized size = 0.86

$$\frac{\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{c\,\ln(f)}\,\left(a+b\,x\right)\right)\left(\frac{a^2}{b^3}-\frac{1}{2\,b^3\,c\,\ln(f)}\right)}{2\,\sqrt{c\,\ln(f)}}-\frac{a\,f^{b^2\,c\,x^2}\,f^{a^2\,c}\,f^{2\,a\,b\,c\,x}}{2\,b^3\,c\,\ln(f)}+\frac{f^{b^2\,c\,x^2}\,f^{a^2\,c}\,f^{2\,a\,b\,c\,x}\,x}{2\,b^2\,c\,\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(a + b*x)^2)*x^2,x)
```

```
[Out] (pi^(1/2)*erfi((c*log(f))^(1/2)*(a + b*x))*(a^2/b^3 - 1/(2*b^3*c*log(f))))/
(2*(c*log(f))^(1/2)) - (a*f^(b^2*c*x^2)*f^(a^2*c)*f^(2*a*b*c*x))/(2*b^3*c*l
og(f)) + (f^(b^2*c*x^2)*f^(a^2*c)*f^(2*a*b*c*x)*x)/(2*b^2*c*log(f))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{c(a+bx)^2}x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*(b*x+a)**2)*x**2,x)
```

```
[Out] Integral(f**(c*(a + b*x)**2)*x**2, x)
```

3.197 $\int f^{c(a+bx)^2}x\,dx$

Optimal. Leaf size=68

$$\frac{f^{c(a+bx)^2}}{2b^2c\log(f)}-\frac{\sqrt{\pi}\,a\,\mathrm{erfi}\left(\sqrt{c}\,\sqrt{\log(f)}\,(a+bx)\right)}{2b^2\sqrt{c}\,\sqrt{\log(f)}}$$

```
[Out] 1/2*f^(c*(b*x+a)^2)/b^2/c/ln(f)-1/2*a*erfi((b*x+a)*c^(1/2)*ln(f)^(1/2))*Pi^
(1/2)/b^2/c^(1/2)/ln(f)^(1/2)
```

Rubi [A] time = 0.06, antiderivative size = 68, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231, Rules used = {2226, 2204, 2209}

$$\frac{f^{c(a+bx)^2}}{2b^2c\log(f)}-\frac{\sqrt{\pi}\,a\,\mathrm{Erfi}\left(\sqrt{c}\,\sqrt{\log(f)}\,(a+bx)\right)}{2b^2\sqrt{c}\,\sqrt{\log(f)}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c*(a + b*x)^2)*x,x]
```

```
[Out] f^(c*(a + b*x)^2)/(2*b^2*c*Log[f]) - (a*Sqrt[Pi]*Erfi[Sqrt[c]*(a + b*x)*Sqr
t[Log[f]]])/(2*b^2*Sqrt[c]*Sqrt[Log[f]])
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2226

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int f^{c(a+bx)^2}x\,dx = \int \left(-\frac{af^{c(a+bx)^2}}{b} + \frac{f^{c(a+bx)^2}(a+bx)}{b}\right)dx$$
$$= \frac{\int f^{c(a+bx)^2}(a+bx)\,dx}{b} - \frac{a\int f^{c(a+bx)^2}\,dx}{b}$$
$$= \frac{f^{c(a+bx)^2}}{2b^2c\log(f)} - \frac{a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{c}\,(a+bx)\sqrt{\log(f)}\right)}{2b^2\sqrt{c}\,\sqrt{\log(f)}}$$

Mathematica [A] time = 0.03, size = 63, normalized size = 0.93

$$\frac{f^{c(a+bx)^2} - \sqrt{\pi}\,a\sqrt{c}\,\sqrt{\log(f)}\,\mathrm{erfi}\left(\sqrt{c}\,\sqrt{\log(f)}\,(a+bx)\right)}{2b^2c\log(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c*(a + b*x)^2)*x,x]
```

```
[Out] (f^(c*(a + b*x)^2) - a*Sqrt[c]*Sqrt[Pi]*Erfi[Sqrt[c]*(a + b*x)*Sqrt[Log[f]]
]*Sqrt[Log[f]])/(2*b^2*c*Log[f])
```

fricas [A] time = 0.45, size = 72, normalized size = 1.06

$$\frac{\sqrt{\pi}\,\sqrt{-b^2c\log(f)}\,a\,\mathrm{erf}\left(\frac{\sqrt{-b^2c\log(f)}\,(bx+a)}{b}\right) + bf^{b^2cx^2+2\,abcx+a^2c}}{2\,b^3c\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^2)*x,x, algorithm="fricas")
```

```
[Out] 1/2*(sqrt(pi)*sqrt(-b^2*c*log(f))*a*erf(sqrt(-b^2*c*log(f))*(b*x + a)/b) +
b*f^(b^2*c*x^2 + 2*a*b*c*x + a^2*c))/(b^3*c*log(f))
```

giac [A] time = 0.25, size = 77, normalized size = 1.13

$$\frac{\frac{\sqrt{\pi}\,a\,\mathrm{erf}\left(-\sqrt{-c\log(f)}\,b\left(x+\frac{a}{b}\right)\right)}{\sqrt{-c\log(f)}\,b} + \frac{e^{\left(b^2cx^2\log(f)+2\,abcx\log(f)+a^2c\log(f)\right)}}{bc\log(f)}}{2\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^2)*x,x, algorithm="giac")
```

```
[Out] 1/2*(sqrt(pi)*a*erf(-sqrt(-c*log(f))*b*(x + a/b))/(sqrt(-c*log(f))*b) + e^(
b^2*c*x^2*log(f) + 2*a*b*c*x*log(f) + a^2*c*log(f))/(b*c*log(f)))/b
```

maple [A] time = 0.05, size = 80, normalized size = 1.18

$$\frac{\sqrt{\pi}\, a \operatorname{erf}\left(\frac{ac\ln(f)}{\sqrt{-c\ln(f)}} - \sqrt{-c\ln(f)}\, bx\right)}{2\sqrt{-c\ln(f)}\, b^2} + \frac{f^{a^2c} f^{b^2cx^2} f^{2abcx}}{2b^2c\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(b*x+a)^2)*x,x)
```

```
[Out] 1/2/b^2/c/ln(f)*f^(b^2*c*x^2)*f^(2*a*b*c*x)*f^(a^2*c)+1/2*a/b^2*Pi^(1/2)/(-
c*ln(f))^(1/2)*erf(1/(-c*ln(f))^(1/2)*a*c*ln(f)-(-c*ln(f))^(1/2)*b*x)
```

maxima [B] time = 1.27, size = 131, normalized size = 1.93

$$-\frac{\frac{\sqrt{\pi}\left(b^2cx+abc\right)ac\left(\operatorname{erf}\left(\sqrt{-\frac{\left(b^2cx+abc\right)^2\log(f)}{b^2c}}\right)-1\right)\log(f)^2}{\left(c\log(f)\right)^{\frac{3}{2}}b^2\sqrt{-\frac{\left(b^2cx+abc\right)^2\log(f)}{b^2c}}} - \frac{cf^{\frac{\left(b^2cx+abc\right)^2}{b^2c}}\log(f)}{\left(c\log(f)\right)^{\frac{3}{2}}b}}{2\sqrt{c\log(f)}\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^2)*x,x, algorithm="maxima")
```

```
[Out] -1/2*(sqrt(pi)*(b^2*c*x + a*b*c)*a*c*(erf(sqrt(-(b^2*c*x + a*b*c)^2*log(f)/
(b^2*c))) - 1)*log(f)^2/((c*log(f))^(3/2)*b^2*sqrt(-(b^2*c*x + a*b*c)^2*log
(f)/(b^2*c))) - c*f^((b^2*c*x + a*b*c)^2/(b^2*c))*log(f)/((c*log(f))^(3/2)*
b))/(sqrt(c*log(f))*b)
```

mupad [B] time = 3.48, size = 66, normalized size = 0.97

$$\frac{f^{b^2\,c\,x^2}\,f^{a^2\,c}\,f^{2\,a\,b\,c\,x}}{2\,b^2\,c\,\ln(f)} - \frac{a\,\sqrt{\pi}\,\operatorname{erfi}\left(\sqrt{c\,\ln(f)}\,\,(a+b\,x)\right)}{2\,b^2\,\sqrt{c\,\ln(f)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(a + b*x)^2)*x,x)
```

```
[Out] (f^(b^2*c*x^2)*f^(a^2*c)*f^(2*a*b*c*x))/(2*b^2*c*log(f)) - (a*pi^(1/2)*erfi
((c*log(f))^(1/2)*(a + b*x)))/(2*b^2*(c*log(f))^(1/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{c(a+bx)^2}x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*(b*x+a)**2)*x,x)
```

```
[Out] Integral(f**(c*(a + b*x)**2)*x, x)
```

3.198 $\int f^{c(a+bx)^2}\,dx$

Optimal. Leaf size=41

$$\frac{\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{c}\,\sqrt{\log(f)}\,(a+bx)\right)}{2b\sqrt{c}\,\sqrt{\log(f)}}$$

```
[Out] 1/2*erfi((b*x+a)*c^(1/2)*ln(f)^(1/2))*Pi^(1/2)/b/c^(1/2)/ln(f)^(1/2)
```

Rubi [A] time = 0.01, antiderivative size = 41, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {2204}

$$\frac{\sqrt{\pi}\,\mathrm{Erfi}\left(\sqrt{c}\,\sqrt{\log(f)}\,(a+bx)\right)}{2b\sqrt{c}\,\sqrt{\log(f)}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c*(a + b*x)^2),x]
```

```
[Out] (Sqrt[Pi]*Erfi[Sqrt[c]*(a + b*x)*Sqrt[Log[f]]])/(2*b*Sqrt[c]*Sqrt[Log[f]])
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rubi steps

$$\int f^{c(a+bx)^2}\,dx=\frac{\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{c}\,(a+bx)\sqrt{\log(f)}\right)}{2b\sqrt{c}\,\sqrt{\log(f)}}$$

Mathematica [A] time = 0.00, size = 41, normalized size = 1.00

$$\frac{\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{c}\,\sqrt{\log(f)}\,(a+bx)\right)}{2b\sqrt{c}\,\sqrt{\log(f)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c*(a + b*x)^2),x]
```

```
[Out] (Sqrt[Pi]*Erfi[Sqrt[c]*(a + b*x)*Sqrt[Log[f]]])/(2*b*Sqrt[c]*Sqrt[Log[f]])
```

fricas [A] time = 0.42, size = 45, normalized size = 1.10

$$-\frac{\sqrt{\pi}\,\sqrt{-b^2c\log(f)}\,\operatorname{erf}\left(\frac{\sqrt{-b^2c\log(f)}\,(bx+a)}{b}\right)}{2\,b^2c\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^2),x, algorithm="fricas")
```

```
[Out] -1/2*sqrt(pi)*sqrt(-b^2*c*log(f))*erf(sqrt(-b^2*c*log(f))*(b*x + a)/b)/(b^2
*c*log(f))
```

giac [A] time = 0.20, size = 33, normalized size = 0.80

$$-\frac{\sqrt{\pi}\,\operatorname{erf}\left(-\sqrt{-c\log(f)}\,b\left(x+\frac{a}{b}\right)\right)}{2\,\sqrt{-c\log(f)}\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^2),x, algorithm="giac")
```

```
[Out] -1/2*sqrt(pi)*erf(-sqrt(-c*log(f))*b*(x + a/b))/(sqrt(-c*log(f))*b)
```

maple [A] time = 0.05, size = 41, normalized size = 1.00

$$-\frac{\sqrt{\pi}\;\operatorname{erf}\left(\frac{ac\ln(f)}{\sqrt{-c\ln(f)}}-\sqrt{-c\ln(f)}\;bx\right)}{2\sqrt{-c\ln(f)}\;b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(b*x+a)^2),x)
```

```
[Out] -1/2*Pi^(1/2)/b/(-c*ln(f))^(1/2)*erf(1/(-c*ln(f))^(1/2)*a*c*ln(f)-(-c*ln(f)
)^(1/2)*b*x)
```

maxima [A] time = 0.59, size = 40, normalized size = 0.98

$$\frac{\sqrt{\pi}\,\operatorname{erf}\left(\sqrt{-c\log(f)}\,bx-\frac{ac\log(f)}{\sqrt{-c\log(f)}}\right)}{2\,\sqrt{-c\log(f)}\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^2),x, algorithm="maxima")
```

```
[Out] 1/2*sqrt(pi)*erf(sqrt(-c*log(f))*b*x - a*c*log(f)/sqrt(-c*log(f)))/(sqrt(-c
*log(f))*b)
```

mupad [B] time = 0.04, size = 45, normalized size = 1.10

$$-\frac{\sqrt{\pi}\,\mathrm{erf}\left(\frac{1\mathrm{i}\,c\,x\,\ln(f)\,b^2+1\mathrm{i}\,a\,c\,\ln(f)\,b}{\sqrt{b^2\,c\,\ln(f)}}\right)\,1\mathrm{i}}{2\,\sqrt{b^2\,c\,\ln(f)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(a + b*x)^2),x)
```

```
[Out] -(pi^(1/2)*erf((a*b*c*log(f)*1i + b^2*c*x*log(f)*1i)/(b^2*c*log(f))^(1/2))*
1i)/(2*(b^2*c*log(f))^(1/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{c(a+bx)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*(b*x+a)**2),x)
```

```
[Out] Integral(f**(c*(a + b*x)**2), x)
```

3.199 $\int \frac{f^{c(a+bx)^2}}{x} dx$

Optimal. Leaf size=18

$$\text{Int}\left(\frac{f^{c(a+bx)^2}}{x},x\right)$$

```
[Out] Unintegrable(f^(c*(b*x+a)^2)/x,x)
```

Rubi [A] time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{f^{c(a+bx)^2}}{x} dx$$

Verification is Not applicable to the result.

```
[In] Int[f^(c*(a + b*x)^2)/x,x]
```

```
[Out] Defer[Int][f^(c*(a + b*x)^2)/x, x]
```

Rubi steps

$$\int \frac{f^{c(a+bx)^2}}{x} dx = \int \frac{f^{c(a+bx)^2}}{x} dx$$

Mathematica [A] time = 0.12, size = 0, normalized size = 0.00

$$\int \frac{f^{c(a+bx)^2}}{x} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[f^(c*(a + b*x)^2)/x,x]
```

```
[Out] Integrate[f^(c*(a + b*x)^2)/x, x]
```

fricas [A] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{f^{b^2cx^2+2\,abcx+a^2c}}{x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^2)/x,x, algorithm="fricas")
[Out] integral(f^(b^2*c*x^2 + 2*a*b*c*x + a^2*c)/x, x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{(bx+a)^2c}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^2)/x,x, algorithm="giac")
[Out] integrate(f^((b*x + a)^2*c)/x, x)
```

maple [A] time = 0.04, size = 0, normalized size = 0.00

$$\int \frac{f^{(bx+a)^2c}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(b*x+a)^2)/x,x)
[Out] int(f^(c*(b*x+a)^2)/x,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{(bx+a)^2c}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^2)/x,x, algorithm="maxima")
[Out] integrate(f^((b*x + a)^2*c)/x, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.06

$$\int \frac{f^{c\,(a+b\,x)^2}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(a + b*x)^2)/x,x)
[Out] int(f^(c*(a + b*x)^2)/x, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{c(a+bx)^2}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*(b*x+a)**2)/x,x)
```

```
[Out] Integral(f**(c*(a + b*x)**2)/x, x)
```

3.200 $\int \frac{f^{c(a+bx)^2}}{x^2} \, dx$

Optimal. Leaf size=78

$$2abc\log(f)\text{Int}\left(\frac{f^{c(a+bx)^2}}{x},x\right)+\sqrt{\pi}\,b\sqrt{c}\,\sqrt{\log(f)}\,\text{erfi}\left(\sqrt{c}\,\sqrt{\log(f)}\,(a+bx)\right)-\frac{f^{c(a+bx)^2}}{x}$$

```
[Out] -f^(c*(b*x+a)^2)/x+b*erfi((b*x+a)*c^(1/2)*ln(f)^(1/2))*c^(1/2)*Pi^(1/2)*ln(
f)^(1/2)+2*a*b*c*ln(f)*Unintegrable(f^(c*(b*x+a)^2)/x,x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{f^{c(a+bx)^2}}{x^2} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[f^(c*(a + b*x)^2)/x^2,x]
```

```
[Out] -(f^(c*(a + b*x)^2)/x) + b*Sqrt[c]*Sqrt[Pi]*Erfi[Sqrt[c]*(a + b*x)*Sqrt[Log
[f]]]*Sqrt[Log[f]] + 2*a*b*c*Log[f]*Defer[Int][f^(c*(a + b*x)^2)/x, x]
```

Rubi steps

$$\begin{aligned}\int \frac{f^{c(a+bx)^2}}{x^2} \, dx &= -\frac{f^{c(a+bx)^2}}{x}+(2abc\log(f))\int \frac{f^{c(a+bx)^2}}{x} \, dx+\left(2b^2c\log(f)\right)\int f^{c(a+bx)^2} \, dx\\ &= -\frac{f^{c(a+bx)^2}}{x}+b\sqrt{c}\,\sqrt{\pi}\,\text{erfi}\left(\sqrt{c}\,(a+bx)\sqrt{\log(f)}\right)\sqrt{\log(f)}+(2abc\log(f))\int \frac{f^{c(a+bx)^2}}{x} \, dx\end{aligned}$$

Mathematica [A] time = 0.32, size = 0, normalized size = 0.00

$$\int \frac{f^{c(a+bx)^2}}{x^2} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[f^(c*(a + b*x)^2)/x^2,x]
```

```
[Out] Integrate[f^(c*(a + b*x)^2)/x^2, x]
```

fricas [A] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{f^{b^2cx^2+2\,abcx+a^2c}}{x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^2)/x^2,x, algorithm="fricas")
[Out] integral(f^(b^2*c*x^2 + 2*a*b*c*x + a^2*c)/x^2, x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{(bx+a)^2c}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^2)/x^2,x, algorithm="giac")
[Out] integrate(f^((b*x + a)^2*c)/x^2, x)
```

maple [A] time = 0.04, size = 0, normalized size = 0.00

$$\int \frac{f^{(bx+a)^2c}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^((b*x+a)^2*c)/x^2,x)
[Out] int(f^((b*x+a)^2*c)/x^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{(bx+a)^2c}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^2)/x^2,x, algorithm="maxima")
[Out] integrate(f^((b*x + a)^2*c)/x^2, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{f^{c\,(a+b\,x)^2}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(a + b*x)^2)/x^2,x)
```

```
[Out] int(f^(c*(a + b*x)^2)/x^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{c(a+bx)^2}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*(b*x+a)**2)/x**2,x)
```

```
[Out] Integral(f**(c*(a + b*x)**2)/x**2, x)
```

3.201 $\int \frac{f^{c(a+bx)^2}}{x^3} \, dx$

Optimal. Leaf size=137

$$2a^2b^2c^2 \log^2(f)\text{Int}\left(\frac{f^{c(a+bx)^2}}{x},x\right)+b^2c\log(f)\text{Int}\left(\frac{f^{c(a+bx)^2}}{x},x\right)+\sqrt{\pi}\,ab^2c^{3/2}\log^{\frac{3}{2}}(f)\text{erfi}\left(\sqrt{c}\sqrt{\log(f)}\,(a+bx)\right)-\frac{f^{c}}{}$$

```
[Out] -1/2*f^(c*(b*x+a)^2)/x^2-a*b*c*f^(c*(b*x+a)^2)*ln(f)/x+a*b^2*c^(3/2)*erfi((
b*x+a)*c^(1/2)*ln(f)^(1/2))*ln(f)^(3/2)*Pi^(1/2)+b^2*c*ln(f)*Unintegrable(f
^(c*(b*x+a)^2)/x,x)+2*a^2*b^2*c^2*ln(f)^2*Unintegrable(f^(c*(b*x+a)^2)/x,x)
```

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{f^{c(a+bx)^2}}{x^3} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[f^(c*(a + b*x)^2)/x^3,x]
```

```
[Out] -f^(c*(a + b*x)^2)/(2*x^2) - (a*b*c*f^(c*(a + b*x)^2)*Log[f])/x + a*b^2*c^(
3/2)*Sqrt[Pi]*Erfi[Sqrt[c]*(a + b*x)*Sqrt[Log[f]]]*Log[f]^(3/2) + b^2*c*Log
[f]*Defer[Int][f^(c*(a + b*x)^2)/x, x] + 2*a^2*b^2*c^2*Log[f]^2*Defer[Int][
f^(c*(a + b*x)^2)/x, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{f^{c(a+bx)^2}}{x^3} \, dx &= -\frac{f^{c(a+bx)^2}}{2x^2} + (abc\log(f)) \int \frac{f^{c(a+bx)^2}}{x^2} \, dx + \left(b^2c\log(f)\right) \int \frac{f^{c(a+bx)^2}}{x} \, dx \\
&= -\frac{f^{c(a+bx)^2}}{2x^2} - \frac{abcf^{c(a+bx)^2}\log(f)}{x} + \left(b^2c\log(f)\right) \int \frac{f^{c(a+bx)^2}}{x} \, dx + \left(2a^2b^2c^2\log^2(f)\right) \int \frac{f^{c(a+bx)^2}}{x} \\
&= -\frac{f^{c(a+bx)^2}}{2x^2} - \frac{abcf^{c(a+bx)^2}\log(f)}{x} + ab^2c^{3/2}\sqrt{\pi}\,\text{erfi}\left(\sqrt{c}\,(a+bx)\sqrt{\log(f)}\right)\log^{\frac{3}{2}}(f) + \left(b^2c\log(f\right.
\end{aligned}$$

Mathematica [A] time = 0.43, size = 0, normalized size = 0.00

$$\int \frac{f^{c(a+bx)^2}}{x^3} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[f^(c*(a + b*x)^2)/x^3,x]
[Out] Integrate[f^(c*(a + b*x)^2)/x^3, x]
```

fricas [A] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{f^{b^2cx^2+2\,abcx+a^2c}}{x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^2)/x^3,x, algorithm="fricas")
[Out] integral(f^(b^2*c*x^2 + 2*a*b*c*x + a^2*c)/x^3, x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{(bx+a)^2c}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^2)/x^3,x, algorithm="giac")
[Out] integrate(f^((b*x + a)^2*c)/x^3, x)
```

maple [A] time = 0.05, size = 0, normalized size = 0.00

$$\int \frac{f^{(bx+a)^2c}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^((b*x+a)^2*c)/x^3,x)
[Out] int(f^((b*x+a)^2*c)/x^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{(bx+a)^2c}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^2)/x^3,x, algorithm="maxima")
[Out] integrate(f^((b*x + a)^2*c)/x^3, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{f^{c\,(a+b\,x)^2}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(a + b*x)^2)/x^3,x)
```

```
[Out] int(f^(c*(a + b*x)^2)/x^3, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{c(a+bx)^2}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*(b*x+a)**2)/x**3,x)
```

```
[Out] Integral(f**(c*(a + b*x)**2)/x**3, x)
```

3.202 $\int f^{c(a+bx)^3} x^2\,dx$

Optimal. Leaf size=120

$$-\frac{a^2(a+bx)\Gamma\left(\frac{1}{3},-c(a+bx)^3\log(f)\right)}{3b^3\sqrt[3]{-c\log(f)(a+bx)^3}}+\frac{f^{c(a+bx)^3}}{3b^3c\log(f)}+\frac{2a(a+bx)^2\Gamma\left(\frac{2}{3},-c(a+bx)^3\log(f)\right)}{3b^3\left(-c\log(f)(a+bx)^3\right)^{2/3}}$$

```
[Out] 1/3*f^(c*(b*x+a)^3)/b^3/c/ln(f)+2/3*a*(b*x+a)^2*GAMMA(2/3,-c*(b*x+a)^3*ln(f
))/b^3/(-c*(b*x+a)^3*ln(f))^(2/3)-1/3*a^2*(b*x+a)*GAMMA(1/3,-c*(b*x+a)^3*ln
(f))/b^3/(-c*(b*x+a)^3*ln(f))^(1/3)
```

Rubi [A] time = 0.09, antiderivative size = 120, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267, Rules used = {2226, 2208, 2218, 2209}

$$-\frac{a^2(a+bx)\text{Gamma}\left(\frac{1}{3},-c\log(f)(a+bx)^3\right)}{3b^3\sqrt[3]{-c\log(f)(a+bx)^3}}+\frac{2a(a+bx)^2\text{Gamma}\left(\frac{2}{3},-c\log(f)(a+bx)^3\right)}{3b^3\left(-c\log(f)(a+bx)^3\right)^{2/3}}+\frac{f^{c(a+bx)^3}}{3b^3c\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c*(a + b*x)^3)*x^2,x]
```

```
[Out] f^(c*(a + b*x)^3)/(3*b^3*c*Log[f]) + (2*a*(a + b*x)^2*Gamma[2/3, -(c*(a + b
*x)^3*Log[f])])/(3*b^3*(-(c*(a + b*x)^3*Log[f]))^(2/3)) - (a^2*(a + b*x)*Ga
mma[1/3, -(c*(a + b*x)^3*Log[f])])/(3*b^3*(-(c*(a + b*x)^3*Log[f]))^(1/3))
```

Rule 2208

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> -Simp[(F^a
*(c + d*x)*Gamma[1/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x)^n*Log[F
]))^(1/n)), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
```

```
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2226

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\begin{aligned}\int f^{c(a+bx)^3}x^2\,dx &= \int\left(\frac{a^2f^{c(a+bx)^3}}{b^2}-\frac{2af^{c(a+bx)^3}(a+bx)}{b^2}+\frac{f^{c(a+bx)^3}(a+bx)^2}{b^2}\right)dx\\ &= \frac{\int f^{c(a+bx)^3}(a+bx)^2\,dx}{b^2}-\frac{(2a)\int f^{c(a+bx)^3}(a+bx)\,dx}{b^2}+\frac{a^2\int f^{c(a+bx)^3}\,dx}{b^2}\\ &= \frac{f^{c(a+bx)^3}}{3b^3c\log(f)}+\frac{2a(a+bx)^2\Gamma\left(\frac{2}{3},-c(a+bx)^3\log(f)\right)}{3b^3\left(-c(a+bx)^3\log(f)\right)^{2/3}}-\frac{a^2(a+bx)\Gamma\left(\frac{1}{3},-c(a+bx)^3\log(f)\right)}{3b^3\sqrt[3]{-c(a+bx)^3\log(f)}}\end{aligned}$$

Mathematica [A] time = 0.20, size = 111, normalized size = 0.92

$$\frac{-\frac{a^2(a+bx)\Gamma\left(\frac{1}{3},-c(a+bx)^3\log(f)\right)}{\sqrt[3]{-c\log(f)(a+bx)^3}}+\frac{f^{c(a+bx)^3}}{c\log(f)}+\frac{2a(a+bx)^2\Gamma\left(\frac{2}{3},-c(a+bx)^3\log(f)\right)}{\left(-c\log(f)(a+bx)^3\right)^{2/3}}}{3b^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c*(a + b*x)^3)*x^2,x]
```

```
[Out] (f^(c*(a + b*x)^3)/(c*Log[f]) + (2*a*(a + b*x)^2*Gamma[2/3, -(c*(a + b*x)^3
*Log[f])])/(-(c*(a + b*x)^3*Log[f]))^(2/3) - (a^2*(a + b*x)*Gamma[1/3, -(c*
(a + b*x)^3*Log[f])])/(-(c*(a + b*x)^3*Log[f]))^(1/3))/(3*b^3)
```

fricas [A] time = 0.46, size = 155, normalized size = 1.29

$$\frac{\left(-b^3c\log(f)\right)^{\frac{2}{3}}a^2\Gamma\left(\frac{1}{3},-\left(b^3cx^3+3\,ab^2cx^2+3\,a^2bcx+a^3c\right)\log(f)\right)-2\left(-b^3c\log(f)\right)^{\frac{1}{3}}ab\Gamma\left(\frac{2}{3},-\left(b^3cx^3+3\,ab^2c\right.\right.}{3\,b^5c\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^3)*x^2,x, algorithm="fricas")
```

```
[Out] 1/3*((-b^3*c*log(f))^(2/3)*a^2*gamma(1/3, -(b^3*c*x^3 + 3*a*b^2*c*x^2 + 3*a
^2*b*c*x + a^3*c)*log(f)) - 2*(-b^3*c*log(f))^(1/3)*a*b*gamma(2/3, -(b^3*c*
x^3 + 3*a*b^2*c*x^2 + 3*a^2*b*c*x + a^3*c)*log(f)) + b^2*f^(b^3*c*x^3 + 3*a
*b^2*c*x^2 + 3*a^2*b*c*x + a^3*c))/(b^5*c*log(f))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{(bx+a)^3c}x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^3)*x^2,x, algorithm="giac")
```

```
[Out] integrate(f^((b*x + a)^3*c)*x^2, x)
```

maple [F] time = 0.04, size = 0, normalized size = 0.00

$$\int x^2 f^{(bx+a)^3c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(b*x+a)^3)*x^2,x)
```

```
[Out] int(f^(c*(b*x+a)^3)*x^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{(bx+a)^3c}x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^3)*x^2,x, algorithm="maxima")
```

```
[Out] integrate(f^((b*x + a)^3*c)*x^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int f^{c\,(a+b\,x)^3}\,x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(a + b*x)^3)*x^2,x)
```

```
[Out] int(f^(c*(a + b*x)^3)*x^2, x)
```

<u>**sympy**</u> **[F]** time = 0.00, size = 0, normalized size = 0.00

$$\int f^{c(a+bx)^3}x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*(b*x+a)**3)*x**2,x)
```

```
[Out] Integral(f**(c*(a + b*x)**3)*x**2, x)
```

3.203 $\int f^{c(a+bx)^3} x\,dx$

Optimal. Leaf size=92

$$\frac{a(a+bx)\Gamma\left(\frac{1}{3},-c(a+bx)^3\log(f)\right)}{3b^2\sqrt[3]{-c\log(f)(a+bx)^3}}-\frac{(a+bx)^2\Gamma\left(\frac{2}{3},-c(a+bx)^3\log(f)\right)}{3b^2\left(-c\log(f)(a+bx)^3\right)^{2/3}}$$

```
[Out] -1/3*(b*x+a)^2*GAMMA(2/3,-c*(b*x+a)^3*ln(f))/b^2/(-c*(b*x+a)^3*ln(f))^(2/3)
+1/3*a*(b*x+a)*GAMMA(1/3,-c*(b*x+a)^3*ln(f))/b^2/(-c*(b*x+a)^3*ln(f))^(1/3)
```

Rubi [A] time = 0.05, antiderivative size = 92, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231, Rules used = {2226, 2208, 2218}

$$\frac{a(a+bx)\text{Gamma}\left(\frac{1}{3},-c\log(f)(a+bx)^3\right)}{3b^2\sqrt[3]{-c\log(f)(a+bx)^3}}-\frac{(a+bx)^2\text{Gamma}\left(\frac{2}{3},-c\log(f)(a+bx)^3\right)}{3b^2\left(-c\log(f)(a+bx)^3\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c*(a + b*x)^3)*x,x]
```

```
[Out] -((a + b*x)^2*Gamma[2/3, -(c*(a + b*x)^3*Log[f])])/(3*b^2*(-(c*(a + b*x)^3*
Log[f]))^(2/3)) + (a*(a + b*x)*Gamma[1/3, -(c*(a + b*x)^3*Log[f])])/(3*b^2*
(-(c*(a + b*x)^3*Log[f]))^(1/3))
```

Rule 2208

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> -Simp[(F^a
*(c + d*x)*Gamma[1/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x)^n*Log[F
]))^(1/n)), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2226

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
```

```
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int f^{c(a+bx)^3}x\,dx=\int\left(-\frac{af^{c(a+bx)^3}}{b}+\frac{f^{c(a+bx)^3}(a+bx)}{b}\right)dx$$
$$=\frac{\int f^{c(a+bx)^3}(a+bx)\,dx}{b}-\frac{a\int f^{c(a+bx)^3}\,dx}{b}$$
$$=-\frac{(a+bx)^2\Gamma\left(\frac{2}{3},-c(a+bx)^3\log(f)\right)}{3b^2\left(-c(a+bx)^3\log(f)\right)^{2/3}}+\frac{a(a+bx)\Gamma\left(\frac{1}{3},-c(a+bx)^3\log(f)\right)}{3b^2\sqrt[3]{-c(a+bx)^3\log(f)}}$$

Mathematica [A] time = 0.05, size = 86, normalized size = 0.93

$$-\frac{(a+bx)\left((a+bx)\Gamma\left(\frac{2}{3},-c(a+bx)^3\log(f)\right)-a\sqrt[3]{-c\log(f)(a+bx)^3}\,\Gamma\left(\frac{1}{3},-c(a+bx)^3\log(f)\right)\right)}{3b^2\left(-c\log(f)(a+bx)^3\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c*(a + b*x)^3)*x,x]
```

```
[Out] -1/3*((a + b*x)*((a + b*x)*Gamma[2/3, -(c*(a + b*x)^3*Log[f])] - a*Gamma[1/
3, -(c*(a + b*x)^3*Log[f])]*(-(c*(a + b*x)^3*Log[f]))^(1/3)))/(b^2*(-(c*(a
+ b*x)^3*Log[f]))^(2/3))
```

fricas [A] time = 0.44, size = 114, normalized size = 1.24

$$-\frac{\left(-b^3c\log(f)\right)^{\frac{2}{3}}a\Gamma\left(\frac{1}{3},-\left(b^3cx^3+3\,ab^2cx^2+3\,a^2bcx+a^3c\right)\log(f)\right)-\left(-b^3c\log(f)\right)^{\frac{1}{3}}b\Gamma\left(\frac{2}{3},-\left(b^3cx^3+3\,ab^2cx^2\right.\right.}{3\,b^4c\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^3)*x,x, algorithm="fricas")
```

```
[Out] -1/3*((-b^3*c*log(f))^(2/3)*a*gamma(1/3, -(b^3*c*x^3 + 3*a*b^2*c*x^2 + 3*a^
2*b*c*x + a^3*c)*log(f)) - (-b^3*c*log(f))^(1/3)*b*gamma(2/3, -(b^3*c*x^3 +
 3*a*b^2*c*x^2 + 3*a^2*b*c*x + a^3*c)*log(f)))/(b^4*c*log(f))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{(bx+a)^3c}x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^3)*x,x, algorithm="giac")
[Out] integrate(f^((b*x + a)^3*c)*x, x)
```

maple [F] time = 0.04, size = 0, normalized size = 0.00

$$\int x\, f^{(bx+a)^3 c}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^((b*x+a)^3*c)*x,x)
[Out] int(f^((b*x+a)^3*c)*x,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{(bx+a)^3 c} x\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^3)*x,x, algorithm="maxima")
[Out] integrate(f^((b*x + a)^3*c)*x, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int f^{c\,(a+b\,x)^3}\, x\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(a + b*x)^3)*x,x)
[Out] int(f^(c*(a + b*x)^3)*x, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{c(a+bx)^3} x\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*(b*x+a)**3)*x,x)
[Out] Integral(f**(c*(a + b*x)**3)*x, x)
```

3.204 $\int f^{c(a+bx)^3}\,dx$

Optimal. Leaf size=44

$$-\frac{(a+bx)\Gamma\left(\frac{1}{3},-c(a+bx)^3\log(f)\right)}{3b\sqrt[3]{-c\log(f)(a+bx)^3}}$$

```
[Out] -1/3*(b*x+a)*GAMMA(1/3,-c*(b*x+a)^3*ln(f))/b/(-c*(b*x+a)^3*ln(f))^(1/3)
```

Rubi [A] time = 0.01, antiderivative size = 44, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {2208}

$$-\frac{(a+bx)\text{Gamma}\left(\frac{1}{3},-c\log(f)(a+bx)^3\right)}{3b\sqrt[3]{-c\log(f)(a+bx)^3}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c*(a + b*x)^3),x]
```

```
[Out] -((a + b*x)*Gamma[1/3, -(c*(a + b*x)^3*Log[f])])/(3*b*(-(c*(a + b*x)^3*Log[
f]))^(1/3))
```

Rule 2208

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> -Simp[(F^a
*(c + d*x)*Gamma[1/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x)^n*Log[F
]))^(1/n)), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rubi steps

$$\int f^{c(a+bx)^3}\,dx=-\frac{(a+bx)\Gamma\left(\frac{1}{3},-c(a+bx)^3\log(f)\right)}{3b\sqrt[3]{-c(a+bx)^3\log(f)}}$$

Mathematica [A] time = 0.01, size = 44, normalized size = 1.00

$$-\frac{(a+bx)\Gamma\left(\frac{1}{3},-c(a+bx)^3\log(f)\right)}{3b\sqrt[3]{-c\log(f)(a+bx)^3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c*(a + b*x)^3),x]
```

```
[Out] -1/3*((a + b*x)*Gamma[1/3, -(c*(a + b*x)^3*Log[f])])/(b*(-(c*(a + b*x)^3*Lo
g[f]))^(1/3))
```

fricas [A] time = 0.42, size = 60, normalized size = 1.36

$$\frac{\left(-b^3 c \log(f)\right)^{\frac{2}{3}} \Gamma\left(\frac{1}{3}, -\left(b^3 c x^3 + 3\, a b^2 c x^2 + 3\, a^2 b c x + a^3 c\right) \log(f)\right)}{3\, b^3 c \log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^3),x, algorithm="fricas")
```

```
[Out] 1/3*(-b^3*c*log(f))^(2/3)*gamma(1/3, -(b^3*c*x^3 + 3*a*b^2*c*x^2 + 3*a^2*b*
c*x + a^3*c)*log(f))/(b^3*c*log(f))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{(bx+a)^3 c}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^3),x, algorithm="giac")
```

```
[Out] integrate(f^((b*x + a)^3*c), x)
```

maple [F] time = 0.04, size = 0, normalized size = 0.00

$$\int f^{(bx+a)^3 c}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^((b*x+a)^3*c),x)
```

```
[Out] int(f^((b*x+a)^3*c),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{(bx+a)^3 c}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^3),x, algorithm="maxima")
```

```
[Out] integrate(f^((b*x + a)^3*c), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int f^{c\,(a+b\,x)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(a + b*x)^3),x)
```

```
[Out] int(f^(c*(a + b*x)^3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{c(a+bx)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*(b*x+a)**3),x)
```

```
[Out] Integral(f**(c*(a + b*x)**3), x)
```

3.205 $\int \frac{f^{c(a+bx)^3}}{x} \, dx$

Optimal. Leaf size=18

$$\text{Int}\left(\frac{f^{c(a+bx)^3}}{x},x\right)$$

```
[Out] Unintegrable(f^(c*(b*x+a)^3)/x,x)
```

Rubi [A] time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{f^{c(a+bx)^3}}{x} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[f^(c*(a + b*x)^3)/x,x]
```

```
[Out] Defer[Int][f^(c*(a + b*x)^3)/x, x]
```

Rubi steps

$$\int \frac{f^{c(a+bx)^3}}{x} \, dx = \int \frac{f^{c(a+bx)^3}}{x} \, dx$$

Mathematica [A] time = 0.30, size = 0, normalized size = 0.00

$$\int \frac{f^{c(a+bx)^3}}{x} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[f^(c*(a + b*x)^3)/x,x]
```

```
[Out] Integrate[f^(c*(a + b*x)^3)/x, x]
```

fricas [A] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{f^{b^3cx^3+3\,ab^2cx^2+3\,a^2bcx+a^3c}}{x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^3)/x,x, algorithm="fricas")
[Out] integral(f^(b^3*c*x^3 + 3*a*b^2*c*x^2 + 3*a^2*b*c*x + a^3*c)/x, x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{(bx+a)^3c}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^3)/x,x, algorithm="giac")
[Out] integrate(f^((b*x + a)^3*c)/x, x)
```

maple [A] time = 0.04, size = 0, normalized size = 0.00

$$\int \frac{f^{(bx+a)^3c}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^((b*x+a)^3*c)/x,x)
[Out] int(f^((b*x+a)^3*c)/x,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{(bx+a)^3c}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^3)/x,x, algorithm="maxima")
[Out] integrate(f^((b*x + a)^3*c)/x, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.06

$$\int \frac{f^{c\,(a+b\,x)^3}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(a + b*x)^3)/x,x)
[Out] int(f^(c*(a + b*x)^3)/x, x)
```

sympy [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{c(a+bx)^3}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*(b*x+a)**3)/x,x)
```

```
[Out] Integral(f**(c*(a + b*x)**3)/x, x)
```

3.206 $\int \frac{f^{c(a+bx)^3}}{x^2} dx$

Optimal. Leaf size=133

$$3a^2bc\log(f)\text{Int}\left(\frac{f^{c(a+bx)^3}}{x},x\right)-\frac{f^{c(a+bx)^3}}{x}-\frac{abc\log(f)(a+bx)\Gamma\left(\frac{1}{3},-c(a+bx)^3\log(f)\right)}{\sqrt[3]{-c\log(f)(a+bx)^3}}-\frac{bc\log(f)(a+bx)^2\Gamma\left(\frac{2}{3},-\right.}{\left(-c\log(f)(a+\right.}$$

```
[Out] -f^(c*(b*x+a)^3)/x-b*c*(b*x+a)^2*GAMMA(2/3,-c*(b*x+a)^3*ln(f))*ln(f)/(-c*(b
*x+a)^3*ln(f))^(2/3)-a*b*c*(b*x+a)*GAMMA(1/3,-c*(b*x+a)^3*ln(f))*ln(f)/(-c*
(b*x+a)^3*ln(f))^(1/3)+3*a^2*b*c*ln(f)*Unintegrable(f^(c*(b*x+a)^3)/x,x)
```

Rubi [A] time = 0.30, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{f^{c(a+bx)^3}}{x^2} dx$$

Verification is Not applicable to the result.

```
[In] Int[f^(c*(a + b*x)^3)/x^2,x]
```

```
[Out] -(f^(c*(a + b*x)^3)/x) - (b*c*(a + b*x)^2*Gamma[2/3, -(c*(a + b*x)^3*Log[f]
)]*Log[f])/(-(c*(a + b*x)^3*Log[f]))^(2/3) - (a*b*c*(a + b*x)*Gamma[1/3, -(
c*(a + b*x)^3*Log[f])]*Log[f])/(-(c*(a + b*x)^3*Log[f]))^(1/3) + 3*a^2*b*c*
Log[f]*Defer[Int][f^(c*(a + b*x)^3)/x, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{f^{c(a+bx)^3}}{x^2} dx &= -\frac{f^{c(a+bx)^3}}{x} + (3bc\log(f)) \int \frac{f^{c(a+bx)^3}(a+bx)^2}{x} dx \\
&= -\frac{f^{c(a+bx)^3}}{x} + (3bc\log(f)) \int \left(abf^{c(a+bx)^3} + \frac{a^2 f^{c(a+bx)^3}}{x} + bf^{c(a+bx)^3}(a+bx)\right) dx \\
&= -\frac{f^{c(a+bx)^3}}{x} + \left(3a^2bc\log(f)\right) \int \frac{f^{c(a+bx)^3}}{x} dx + \left(3b^2c\log(f)\right) \int f^{c(a+bx)^3}(a+bx)\, dx + \left(3ab^2c\log\right. \\
&= -\frac{f^{c(a+bx)^3}}{x} - \frac{bc(a+bx)^2\Gamma\left(\frac{2}{3},-c(a+bx)^3\log(f)\right)\log(f)}{\left(-c(a+bx)^3\log(f)\right)^{2/3}} - \frac{abc(a+bx)\Gamma\left(\frac{1}{3},-c(a+bx)^3\log(f\right.}{\sqrt[3]{-c(a+bx)^3\log(f)}}
\end{aligned}$$

Mathematica [A]   time = 1.11, size = 0, normalized size = 0.00

$$\int \frac{f^{c(a+bx)^3}}{x^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[f^(c*(a + b*x)^3)/x^2,x]
[Out] Integrate[f^(c*(a + b*x)^3)/x^2, x]
```

fricas [A]   time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{f^{b^3cx^3+3\,ab^2cx^2+3\,a^2bcx+a^3c}}{x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^3)/x^2,x, algorithm="fricas")
[Out] integral(f^(b^3*c*x^3 + 3*a*b^2*c*x^2 + 3*a^2*b*c*x + a^3*c)/x^2, x)
```

giac [A]   time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{(bx+a)^3c}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^3)/x^2,x, algorithm="giac")
[Out] integrate(f^((b*x + a)^3*c)/x^2, x)
```

maple [A]   time = 0.04, size = 0, normalized size = 0.00

$$\int \frac{f^{(bx+a)^3c}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^((b*x+a)^3*c)/x^2,x)
[Out] int(f^((b*x+a)^3*c)/x^2,x)
```

maxima [A]   time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{(bx+a)^3c}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^3)/x^2,x, algorithm="maxima")
```

```
[Out] integrate(f^((b*x + a)^3*c)/x^2, x)
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{f^{c\,(a+b\,x)^3}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(a + b*x)^3)/x^2,x)
```

```
[Out] int(f^(c*(a + b*x)^3)/x^2, x)
```

sympy [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{c(a+bx)^3}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*(b*x+a)**3)/x**2,x)
```

```
[Out] Integral(f**(c*(a + b*x)**3)/x**2, x)
```

3.207 $\int \frac{f^{c(a+bx)^3}}{x^3} dx$

Optimal. Leaf size=263

$$\frac{9}{2}a^4b^2c^2\log^2(f)\text{Int}\left(\frac{f^{c(a+bx)^3}}{x},x\right)+3ab^2c\log(f)\text{Int}\left(\frac{f^{c(a+bx)^3}}{x},x\right)-\frac{3a^3b^2c^2\log^2(f)(a+bx)\Gamma\left(\frac{1}{3},-c(a+bx)^3\log(f)\right.}{2\sqrt[3]{-c\log(f)(a+bx)^3}}$$

```
[Out] -1/2*f^(c*(b*x+a)^3)/x^2-3/2*a^2*b*c*f^(c*(b*x+a)^3)*ln(f)/x-3/2*a^2*b^2*c^
2*(b*x+a)^2*GAMMA(2/3,-c*(b*x+a)^3*ln(f))*ln(f)^2/(-c*(b*x+a)^3*ln(f))^(2/3
)-1/2*b^2*c*(b*x+a)*GAMMA(1/3,-c*(b*x+a)^3*ln(f))*ln(f)/(-c*(b*x+a)^3*ln(f)
)^(1/3)-3/2*a^3*b^2*c^2*(b*x+a)*GAMMA(1/3,-c*(b*x+a)^3*ln(f))*ln(f)^2/(-c*(
b*x+a)^3*ln(f))^(1/3)+3*a*b^2*c*ln(f)*Unintegrable(f^(c*(b*x+a)^3)/x,x)+9/2
*a^4*b^2*c^2*ln(f)^2*Unintegrable(f^(c*(b*x+a)^3)/x,x)
```

Rubi [A] time = 0.45, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{f^{c(a+bx)^3}}{x^3} dx$$

Verification is Not applicable to the result.

```
[In] Int[f^(c*(a + b*x)^3)/x^3,x]
```

```
[Out] -f^(c*(a + b*x)^3)/(2*x^2) - (3*a^2*b*c*f^(c*(a + b*x)^3)*Log[f])/(2*x) - (
3*a^2*b^2*c^2*(a + b*x)^2*Gamma[2/3, -(c*(a + b*x)^3*Log[f])]*Log[f]^2)/(2*
(-(c*(a + b*x)^3*Log[f]))^(2/3)) - (b^2*c*(a + b*x)*Gamma[1/3, -(c*(a + b*x
)^3*Log[f])]*Log[f])/(2*(-(c*(a + b*x)^3*Log[f]))^(1/3)) - (3*a^3*b^2*c^2*(
a + b*x)*Gamma[1/3, -(c*(a + b*x)^3*Log[f])]*Log[f]^2)/(2*(-(c*(a + b*x)^3*
Log[f]))^(1/3)) + 3*a*b^2*c*Log[f]*Defer[Int][f^(c*(a + b*x)^3)/x, x] + (9*
a^4*b^2*c^2*Log[f]^2*Defer[Int][f^(c*(a + b*x)^3)/x, x])/2
```

Rubi steps

$$\int \frac{f^{c(a+bx)^3}}{x^3}\,dx = -\frac{f^{c(a+bx)^3}}{2x^2} + \frac{1}{2}(3bc\log(f))\int \frac{f^{c(a+bx)^3}(a+bx)^2}{x^2}\,dx$$
$$= -\frac{f^{c(a+bx)^3}}{2x^2} + \frac{1}{2}(3bc\log(f))\int \left(b^2 f^{c(a+bx)^3} + \frac{a^2 f^{c(a+bx)^3}}{x^2} + \frac{2abf^{c(a+bx)^3}}{x}\right)dx$$
$$= -\frac{f^{c(a+bx)^3}}{2x^2} + \frac{1}{2}\left(3a^2bc\log(f)\right)\int \frac{f^{c(a+bx)^3}}{x^2}\,dx + \left(3ab^2c\log(f)\right)\int \frac{f^{c(a+bx)^3}}{x}\,dx + \frac{1}{2}\left(3b^3c\log(f\right.$$
$$= -\frac{f^{c(a+bx)^3}}{2x^2} - \frac{3a^2bcf^{c(a+bx)^3}\log(f)}{2x} - \frac{b^2c(a+bx)\Gamma\left(\frac{1}{3},-c(a+bx)^3\log(f)\right)\log(f)}{2\sqrt[3]{-c(a+bx)^3\log(f)}} + \left(3ab^2c\log\right.$$
$$= -\frac{f^{c(a+bx)^3}}{2x^2} - \frac{3a^2bcf^{c(a+bx)^3}\log(f)}{2x} - \frac{b^2c(a+bx)\Gamma\left(\frac{1}{3},-c(a+bx)^3\log(f)\right)\log(f)}{2\sqrt[3]{-c(a+bx)^3\log(f)}} + \left(3ab^2c\log\right.$$
$$= -\frac{f^{c(a+bx)^3}}{2x^2} - \frac{3a^2bcf^{c(a+bx)^3}\log(f)}{2x} - \frac{b^2c(a+bx)\Gamma\left(\frac{1}{3},-c(a+bx)^3\log(f)\right)\log(f)}{2\sqrt[3]{-c(a+bx)^3\log(f)}} + \left(3ab^2c\log\right.$$
$$= -\frac{f^{c(a+bx)^3}}{2x^2} - \frac{3a^2bcf^{c(a+bx)^3}\log(f)}{2x} - \frac{3a^2b^2c^2(a+bx)^2\Gamma\left(\frac{2}{3},-c(a+bx)^3\log(f)\right)\log^2(f)}{2\left(-c(a+bx)^3\log(f)\right)^{2/3}} - \frac{b^2c(}{}$$

Mathematica [A] time = 1.48, size = 0, normalized size = 0.00

$$\int \frac{f^{c(a+bx)^3}}{x^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[f^(c*(a + b*x)^3)/x^3,x]
```

```
[Out] Integrate[f^(c*(a + b*x)^3)/x^3, x]
```

fricas [A] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{f^{b^3cx^3+3\,ab^2cx^2+3\,a^2bcx+a^3c}}{x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^3)/x^3,x, algorithm="fricas")
```

```
[Out] integral(f^(b^3*c*x^3 + 3*a*b^2*c*x^2 + 3*a^2*b*c*x + a^3*c)/x^3, x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{(bx+a)^3c}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^3)/x^3,x, algorithm="giac")
```

```
[Out] integrate(f^((b*x + a)^3*c)/x^3, x)
```

maple [A] time = 0.05, size = 0, normalized size = 0.00

$$\int \frac{f^{(bx+a)^3c}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^((b*x+a)^3*c)/x^3,x)
```

```
[Out] int(f^((b*x+a)^3*c)/x^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{(bx+a)^3c}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^3)/x^3,x, algorithm="maxima")
```

```
[Out] integrate(f^((b*x + a)^3*c)/x^3, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{f^{c\,(a+b\,x)^3}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(a + b*x)^3)/x^3,x)
```

```
[Out] int(f^(c*(a + b*x)^3)/x^3, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{c(a+bx)^3}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*(b*x+a)**3)/x**3,x)
```

```
[Out] Integral(f**(c*(a + b*x)**3)/x**3, x)
```

3.208 $\int e^{a^3+3a^2bx+3ab^2x^2+b^3x^3}x^4\,dx$

Optimal. Leaf size=183

$$-\frac{a^4(a+bx)\Gamma\left(\frac{1}{3},-(a+bx)^3\right)}{3b^5\sqrt[3]{-(a+bx)^3}}+\frac{4a^3(a+bx)^2\Gamma\left(\frac{2}{3},-(a+bx)^3\right)}{3b^5\left(-(a+bx)^3\right)^{2/3}}+\frac{2a^2e^{(a+bx)^3}}{b^5}-\frac{(a+bx)^5\Gamma\left(\frac{5}{3},-(a+bx)^3\right)}{3b^5\left(-(a+bx)^3\right)^{5/3}}+\frac{4a(a+bx)}{3b^5\,(}$$

```
[Out] 2*a^2*exp((b*x+a)^3)/b^5-1/3*a^4*(b*x+a)*GAMMA(1/3,-(b*x+a)^3)/b^5/(-(b*x+a
)^3)^(1/3)+4/3*a^3*(b*x+a)^2*GAMMA(2/3,-(b*x+a)^3)/b^5/(-(b*x+a)^3)^(2/3)+4
/3*a*(b*x+a)^4*GAMMA(4/3,-(b*x+a)^3)/b^5/(-(b*x+a)^3)^(4/3)-1/3*(b*x+a)^5*G
AMMA(5/3,-(b*x+a)^3)/b^5/(-(b*x+a)^3)^(5/3)
```

Rubi [A] time = 0.18, antiderivative size = 183, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 5, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.152, Rules used = {2227, 2226, 2208, 2218, 2209}

$$\frac{4a^3(a+bx)^2\text{Gamma}\left(\frac{2}{3},-(a+bx)^3\right)}{3b^5\left(-(a+bx)^3\right)^{2/3}}-\frac{a^4(a+bx)\text{Gamma}\left(\frac{1}{3},-(a+bx)^3\right)}{3b^5\sqrt[3]{-(a+bx)^3}}-\frac{(a+bx)^5\text{Gamma}\left(\frac{5}{3},-(a+bx)^3\right)}{3b^5\left(-(a+bx)^3\right)^{5/3}}+\frac{4}{}$$

Antiderivative was successfully verified.

```
[In] Int[E^(a^3 + 3*a^2*b*x + 3*a*b^2*x^2 + b^3*x^3)*x^4,x]
```

```
[Out] (2*a^2*E^(a + b*x)^3)/b^5 - (a^4*(a + b*x)*Gamma[1/3, -(a + b*x)^3])/(3*b^5
*(-(a + b*x)^3)^(1/3)) + (4*a^3*(a + b*x)^2*Gamma[2/3, -(a + b*x)^3])/(3*b^
5*(-(a + b*x)^3)^(2/3)) + (4*a*(a + b*x)^4*Gamma[4/3, -(a + b*x)^3])/(3*b^5
*(-(a + b*x)^3)^(4/3)) - ((a + b*x)^5*Gamma[5/3, -(a + b*x)^3])/(3*b^5*(-(a
 + b*x)^3)^(5/3))
```

Rule 2208

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> -Simp[(F^a
*(c + d*x)*Gamma[1/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x)^n*Log[F
]))^(1/n)), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2226

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rule 2227

```
Int[(u_.)*(F_)^((a_.) + (b_.)*(v_)), x_Symbol] :> Int[u*F^(a + b*NormalizeP
owerOfLinear[v, x]), x] /; FreeQ[{F, a, b}, x] && PolynomialQ[u, x] && Powe
rOfLinearQ[v, x] &&  !PowerOfLinearMatchQ[v, x]
```

Rubi steps

$$\int e^{a^3+3a^2bx+3ab^2x^2+b^3x^3}x^4\,dx = \int e^{(a+bx)^3}x^4\,dx$$
$$= \int \left(\frac{a^4e^{(a+bx)^3}}{b^4} - \frac{4a^3e^{(a+bx)^3}(a+bx)}{b^4} + \frac{6a^2e^{(a+bx)^3}(a+bx)^2}{b^4} - \frac{4ae^{(a+bx)^3}(a+bx)^3}{b^4} +$$
$$= \frac{\int e^{(a+bx)^3}(a+bx)^4\,dx}{b^4} - \frac{(4a)\int e^{(a+bx)^3}(a+bx)^3\,dx}{b^4} + \frac{\left(6a^2\right)\int e^{(a+bx)^3}(a+bx)^2\,dx}{b^4}$$
$$= \frac{2a^2e^{(a+bx)^3}}{b^5} - \frac{a^4(a+bx)\Gamma\left(\frac{1}{3},-(a+bx)^3\right)}{3b^5\sqrt[3]{-(a+bx)^3}} + \frac{4a^3(a+bx)^2\Gamma\left(\frac{2}{3},-(a+bx)^3\right)}{3b^5\left(-(a+bx)^3\right)^{2/3}} + \frac{4a(a}{}$$

Mathematica [A] time = 0.18, size = 164, normalized size = 0.90

$$\frac{-\left(a^4(a+bx)\sqrt[3]{-(a+bx)^3}\,\Gamma\left(\frac{1}{3},-(a+bx)^3\right)\right) + 4a^3(a+bx)^2\Gamma\left(\frac{2}{3},-(a+bx)^3\right) + 6a^2e^{(a+bx)^3}\left(-(a+bx)^3\right)^{2/3} - 4a(a}{3b^5\left(-(a+bx)^3\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a^3 + 3*a^2*b*x + 3*a*b^2*x^2 + b^3*x^3)*x^4,x]
```

```
[Out] (6*a^2*E^(a + b*x)^3*(-(a + b*x)^3)^(2/3) - a^4*(a + b*x)*(-(a + b*x)^3)^(1
/3)*Gamma[1/3, -(a + b*x)^3] + 4*a^3*(a + b*x)^2*Gamma[2/3, -(a + b*x)^3] -
```

```
 4*a*(a + b*x)*(-(a + b*x)^3)^(1/3)*Gamma[4/3, -(a + b*x)^3] + (a + b*x)^2*
Gamma[5/3, -(a + b*x)^3])/(3*b^5*(-(a + b*x)^3)^(2/3))
```

fricas [A] time = 0.47, size = 158, normalized size = 0.86

$$-\frac{2\left(6\,a^{3}+1\right)\left(-b^{3}\right)^{\frac{1}{3}}b\Gamma\left(\frac{2}{3},-b^{3}x^{3}-3\,ab^{2}x^{2}-3\,a^{2}bx-a^{3}\right)-\left(3\,a^{4}+4\,a\right)\left(-b^{3}\right)^{\frac{2}{3}}\Gamma\left(\frac{1}{3},-b^{3}x^{3}-3\,ab^{2}x^{2}-3\,a^{2}bx-\right.}{9\,b^{7}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x^4,x, algorithm="fricas")
```

```
[Out] -1/9*(2*(6*a^3 + 1)*(-b^3)^(1/3)*b*gamma(2/3, -b^3*x^3 - 3*a*b^2*x^2 - 3*a^
2*b*x - a^3) - (3*a^4 + 4*a)*(-b^3)^(2/3)*gamma(1/3, -b^3*x^3 - 3*a*b^2*x^2
 - 3*a^2*b*x - a^3) - 3*(b^4*x^2 - 2*a*b^3*x + 3*a^2*b^2)*e^(b^3*x^3 + 3*a*
b^2*x^2 + 3*a^2*b*x + a^3))/b^7
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x^{4}e^{\left(b^{3}x^{3}+3\,ab^{2}x^{2}+3\,a^{2}bx+a^{3}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x^4,x, algorithm="giac")
```

```
[Out] integrate(x^4*e^(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3), x)
```

maple [F] time = 0.05, size = 0, normalized size = 0.00

$$\int x^{4}{\mathrm e}^{b^{3}x^{3}+3 a\,b^{2}x^{2}+3 a^{2}b x+a^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x^4,x)
```

```
[Out] int(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x^4,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x^{4}e^{\left(b^{3}x^{3}+3\,ab^{2}x^{2}+3\,a^{2}bx+a^{3}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x^4,x, algorithm="maxima")
```

```
[Out] integrate(x^4*e^(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int x^4 \, \mathrm{e}^{a^3+3\,a^2\,b\,x+3\,a\,b^2\,x^2+b^3\,x^3} \,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*exp(a^3 + b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x),x)
[Out] int(x^4*exp(a^3 + b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b**3*x**3+3*a*b**2*x**2+3*a**2*b*x+a**3)*x**4,x)
[Out] Timed out
```

3.209 $\int e^{a^3+3a^2bx+3ab^2x^2+b^3x^3}x^3\,dx$

Optimal. Leaf size=138

$$\frac{a^3(a+bx)\Gamma\left(\frac{1}{3},-(a+bx)^3\right)}{3b^4\sqrt[3]{-(a+bx)^3}}-\frac{a^2(a+bx)^2\Gamma\left(\frac{2}{3},-(a+bx)^3\right)}{b^4\left(-(a+bx)^3\right)^{2/3}}-\frac{ae^{(a+bx)^3}}{b^4}-\frac{(a+bx)^4\Gamma\left(\frac{4}{3},-(a+bx)^3\right)}{3b^4\left(-(a+bx)^3\right)^{4/3}}$$

```
[Out] -a*exp((b*x+a)^3)/b^4+1/3*a^3*(b*x+a)*GAMMA(1/3,-(b*x+a)^3)/b^4/(-(b*x+a)^3
)^(1/3)-a^2*(b*x+a)^2*GAMMA(2/3,-(b*x+a)^3)/b^4/(-(b*x+a)^3)^(2/3)-1/3*(b*x
+a)^4*GAMMA(4/3,-(b*x+a)^3)/b^4/(-(b*x+a)^3)^(4/3)
```

Rubi [A] time = 0.15, antiderivative size = 138, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.152, Rules used = {2227, 2226, 2208, 2218, 2209}

$$-\frac{a^2(a+bx)^2\text{Gamma}\left(\frac{2}{3},-(a+bx)^3\right)}{b^4\left(-(a+bx)^3\right)^{2/3}}+\frac{a^3(a+bx)\text{Gamma}\left(\frac{1}{3},-(a+bx)^3\right)}{3b^4\sqrt[3]{-(a+bx)^3}}-\frac{(a+bx)^4\text{Gamma}\left(\frac{4}{3},-(a+bx)^3\right)}{3b^4\left(-(a+bx)^3\right)^{4/3}}-\frac{a}{}$$

Antiderivative was successfully verified.

```
[In] Int[E^(a^3 + 3*a^2*b*x + 3*a*b^2*x^2 + b^3*x^3)*x^3,x]
```

```
[Out] -((a*E^(a + b*x)^3)/b^4) + (a^3*(a + b*x)*Gamma[1/3, -(a + b*x)^3])/(3*b^4*
(-(a + b*x)^3)^(1/3)) - (a^2*(a + b*x)^2*Gamma[2/3, -(a + b*x)^3])/(b^4*(-(
a + b*x)^3)^(2/3)) - ((a + b*x)^4*Gamma[4/3, -(a + b*x)^3])/(3*b^4*(-(a + b
*x)^3)^(4/3))
```

Rule 2208

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> -Simp[(F^a
*(c + d*x)*Gamma[1/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x)^n*Log[F
]))^(1/n)), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
```

```
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2226

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rule 2227

```
Int[(u_.)*(F_)^((a_.) + (b_.)*(v_)), x_Symbol] :> Int[u*F^(a + b*NormalizeP
owerOfLinear[v, x]), x] /; FreeQ[{F, a, b}, x] && PolynomialQ[u, x] && Powe
rOfLinearQ[v, x] &&  !PowerOfLinearMatchQ[v, x]
```

Rubi steps

$$\int e^{a^3+3a^2bx+3ab^2x^2+b^3x^3}x^3\,dx = \int e^{(a+bx)^3}x^3\,dx$$
$$= \int \left(-\frac{a^3e^{(a+bx)^3}}{b^3} + \frac{3a^2e^{(a+bx)^3}(a+bx)}{b^3} - \frac{3ae^{(a+bx)^3}(a+bx)^2}{b^3} + \frac{e^{(a+bx)^3}(a+bx)^3}{b^3}\right) d$$
$$= \frac{\int e^{(a+bx)^3}(a+bx)^3\,dx}{b^3} - \frac{(3a)\int e^{(a+bx)^3}(a+bx)^2\,dx}{b^3} + \frac{\left(3a^2\right)\int e^{(a+bx)^3}(a+bx)\,dx}{b^3} -$$
$$= -\frac{ae^{(a+bx)^3}}{b^4} + \frac{a^3(a+bx)\Gamma\left(\frac{1}{3}, -(a+bx)^3\right)}{3b^4\sqrt[3]{-(a+bx)^3}} - \frac{a^2(a+bx)^2\Gamma\left(\frac{2}{3}, -(a+bx)^3\right)}{b^4\left(-(a+bx)^3\right)^{2/3}} - \frac{(a+b}{3b}$$

Mathematica [A] time = 0.14, size = 138, normalized size = 1.00

$$\frac{a^3(a+bx)\Gamma\left(\frac{1}{3}, -(a+bx)^3\right)}{3b^4\sqrt[3]{-(a+bx)^3}} - \frac{a^2(a+bx)^2\Gamma\left(\frac{2}{3}, -(a+bx)^3\right)}{b^4\left(-(a+bx)^3\right)^{2/3}} - \frac{ae^{(a+bx)^3}}{b^4} - \frac{(a+bx)^4\Gamma\left(\frac{4}{3}, -(a+bx)^3\right)}{3b^4\left(-(a+bx)^3\right)^{4/3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a^3 + 3*a^2*b*x + 3*a*b^2*x^2 + b^3*x^3)*x^3,x]
```

```
[Out] -((a*E^(a + b*x)^3)/b^4) + (a^3*(a + b*x)*Gamma[1/3, -(a + b*x)^3])/(3*b^4*
(-(a + b*x)^3)^(1/3)) - (a^2*(a + b*x)^2*Gamma[2/3, -(a + b*x)^3])/(b^4*(-(
a + b*x)^3)^(2/3)) - ((a + b*x)^4*Gamma[4/3, -(a + b*x)^3])/(3*b^4*(-(a + b
*x)^3)^(4/3))
```

fricas [A] time = 0.42, size = 141, normalized size = 1.02

$$\frac{9\left(-b^{3}\right)^{\frac{1}{3}}a^{2}b\Gamma\left(\frac{2}{3},-b^{3}x^{3}-3\,ab^{2}x^{2}-3\,a^{2}bx-a^{3}\right)-\left(3\,a^{3}+1\right)\left(-b^{3}\right)^{\frac{2}{3}}\Gamma\left(\frac{1}{3},-b^{3}x^{3}-3\,ab^{2}x^{2}-3\,a^{2}bx-a^{3}\right)+3\left(b^{3}\right.}{9\,b^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x^3,x, algorithm="fricas")
```

```
[Out] 1/9*(9*(-b^3)^(1/3)*a^2*b*gamma(2/3, -b^3*x^3 - 3*a*b^2*x^2 - 3*a^2*b*x - a
^3) - (3*a^3 + 1)*(-b^3)^(2/3)*gamma(1/3, -b^3*x^3 - 3*a*b^2*x^2 - 3*a^2*b*
x - a^3) + 3*(b^3*x - 2*a*b^2)*e^(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3))
/b^6
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x^{3}e^{\left(b^{3}x^{3}+3\,ab^{2}x^{2}+3\,a^{2}bx+a^{3}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x^3,x, algorithm="giac")
```

```
[Out] integrate(x^3*e^(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3), x)
```

maple [F] time = 0.04, size = 0, normalized size = 0.00

$$\int x^{3}\mathrm{e}^{b^{3}x^{3}+3a\,b^{2}x^{2}+3a^{2}bx+a^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x^3,x)
```

```
[Out] int(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x^3,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x^{3}e^{\left(b^{3}x^{3}+3\,ab^{2}x^{2}+3\,a^{2}bx+a^{3}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x^3,x, algorithm="maxima")
```

```
[Out] integrate(x^3*e^(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int x^3\,\mathrm{e}^{a^3+3\,a^2\,b\,x+3\,a\,b^2\,x^2+b^3\,x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*exp(a^3 + b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x),x)
[Out] int(x^3*exp(a^3 + b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b**3*x**3+3*a*b**2*x**2+3*a**2*b*x+a**3)*x**3,x)
[Out] Timed out
```

3.210 $\int e^{a^3+3a^2bx+3ab^2x^2+b^3x^3}x^2\,dx$

Optimal. Leaf size=99

$$-\frac{a^2(a+bx)\Gamma\left(\frac{1}{3},-(a+bx)^3\right)}{3b^3\sqrt[3]{-(a+bx)^3}}+\frac{e^{(a+bx)^3}}{3b^3}+\frac{2a(a+bx)^2\Gamma\left(\frac{2}{3},-(a+bx)^3\right)}{3b^3\left(-(a+bx)^3\right)^{2/3}}$$

```
[Out] 1/3*exp((b*x+a)^3)/b^3-1/3*a^2*(b*x+a)*GAMMA(1/3,-(b*x+a)^3)/b^3/(-(b*x+a)^
3)^(1/3)+2/3*a*(b*x+a)^2*GAMMA(2/3,-(b*x+a)^3)/b^3/(-(b*x+a)^3)^(2/3)
```

Rubi [A] time = 0.12, antiderivative size = 99, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.152, Rules used = {2227, 2226, 2208, 2218, 2209}

$$-\frac{a^2(a+bx)\text{Gamma}\left(\frac{1}{3},-(a+bx)^3\right)}{3b^3\sqrt[3]{-(a+bx)^3}}+\frac{2a(a+bx)^2\text{Gamma}\left(\frac{2}{3},-(a+bx)^3\right)}{3b^3\left(-(a+bx)^3\right)^{2/3}}+\frac{e^{(a+bx)^3}}{3b^3}$$

Antiderivative was successfully verified.

```
[In] Int[E^(a^3 + 3*a^2*b*x + 3*a*b^2*x^2 + b^3*x^3)*x^2,x]
```

```
[Out] E^(a + b*x)^3/(3*b^3) - (a^2*(a + b*x)*Gamma[1/3, -(a + b*x)^3])/(3*b^3*(-(
a + b*x)^3)^(1/3)) + (2*a*(a + b*x)^2*Gamma[2/3, -(a + b*x)^3])/(3*b^3*(-(a
 + b*x)^3)^(2/3))
```

Rule 2208

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> -Simp[(F^a
*(c + d*x)*Gamma[1/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x)^n*Log[F
]))^(1/n)), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
```

```
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2226

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rule 2227

```
Int[(u_.)*(F_)^((a_.) + (b_.)*(v_)), x_Symbol] :> Int[u*F^(a + b*NormalizeP
owerOfLinear[v, x]), x] /; FreeQ[{F, a, b}, x] && PolynomialQ[u, x] && Powe
rOfLinearQ[v, x] &&  !PowerOfLinearMatchQ[v, x]
```

Rubi steps

$$\begin{aligned}\int e^{a^3+3a^2bx+3ab^2x^2+b^3x^3}x^2\,dx &= \int e^{(a+bx)^3}x^2\,dx\\ &= \int\left(\frac{a^2e^{(a+bx)^3}}{b^2}-\frac{2ae^{(a+bx)^3}(a+bx)}{b^2}+\frac{e^{(a+bx)^3}(a+bx)^2}{b^2}\right)dx\\ &= \frac{\int e^{(a+bx)^3}(a+bx)^2\,dx}{b^2}-\frac{(2a)\int e^{(a+bx)^3}(a+bx)\,dx}{b^2}+\frac{a^2\int e^{(a+bx)^3}\,dx}{b^2}\\ &= \frac{e^{(a+bx)^3}}{3b^3}-\frac{a^2(a+bx)\Gamma\left(\frac{1}{3},-(a+bx)^3\right)}{3b^3\sqrt[3]{-(a+bx)^3}}+\frac{2a(a+bx)^2\Gamma\left(\frac{2}{3},-(a+bx)^3\right)}{3b^3\left(-(a+bx)^3\right)^{2/3}}\end{aligned}$$

Mathematica [A] time = 0.08, size = 89, normalized size = 0.90

$$\frac{-\frac{a^2(a+bx)\Gamma\left(\frac{1}{3},-(a+bx)^3\right)}{\sqrt[3]{-(a+bx)^3}}+e^{(a+bx)^3}+\frac{2a(a+bx)^2\Gamma\left(\frac{2}{3},-(a+bx)^3\right)}{\left(-(a+bx)^3\right)^{2/3}}}{3b^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a^3 + 3*a^2*b*x + 3*a*b^2*x^2 + b^3*x^3)*x^2,x]
```

```
[Out] (E^(a + b*x)^3 - (a^2*(a + b*x)*Gamma[1/3, -(a + b*x)^3])/(-(a + b*x)^3)^(1
/3) + (2*a*(a + b*x)^2*Gamma[2/3, -(a + b*x)^3])/(-(a + b*x)^3)^(2/3))/(3*b
^3)
```

fricas [A] time = 0.46, size = 124, normalized size = 1.25

$$\frac{\left(-b^{3}\right)^{\frac{2}{3}} a^{2}\Gamma\left(\frac{1}{3}, -b^{3}x^{3} - 3\,ab^{2}x^{2} - 3\,a^{2}bx - a^{3}\right) - 2\,\left(-b^{3}\right)^{\frac{1}{3}} ab\Gamma\left(\frac{2}{3}, -b^{3}x^{3} - 3\,ab^{2}x^{2} - 3\,a^{2}bx - a^{3}\right) + b^{2}e^{\left(b^{3}x^{3}+3\,ab^{2}x^{2}\right.}}{3\,b^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x^2,x, algorithm="fricas")
```

```
[Out] 1/3*((-b^3)^(2/3)*a^2*gamma(1/3, -b^3*x^3 - 3*a*b^2*x^2 - 3*a^2*b*x - a^3)
- 2*(-b^3)^(1/3)*a*b*gamma(2/3, -b^3*x^3 - 3*a*b^2*x^2 - 3*a^2*b*x - a^3) +
 b^2*e^(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3))/b^5
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x^{2}e^{\left(b^{3}x^{3}+3\,ab^{2}x^{2}+3\,a^{2}bx+a^{3}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x^2,x, algorithm="giac")
```

```
[Out] integrate(x^2*e^(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3), x)
```

maple [F] time = 0.04, size = 0, normalized size = 0.00

$$\int x^{2}\mathrm{e}^{b^{3}x^{3}+3a\,b^{2}x^{2}+3a^{2}bx+a^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x^2,x)
```

```
[Out] int(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x^{2}e^{\left(b^{3}x^{3}+3\,ab^{2}x^{2}+3\,a^{2}bx+a^{3}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x^2,x, algorithm="maxima")
```

```
[Out] integrate(x^2*e^(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int x^{2}\,\mathrm{e}^{a^{3}+3\,a^{2}\,b\,x+3\,a\,b^{2}\,x^{2}+b^{3}\,x^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*exp(a^3 + b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x),x)
```

```
[Out] int(x^2*exp(a^3 + b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$e^{a^3}\int x^2e^{b^3x^3}e^{3ab^2x^2}e^{3a^2bx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b**3*x**3+3*a*b**2*x**2+3*a**2*b*x+a**3)*x**2,x)
```

```
[Out] exp(a**3)*Integral(x**2*exp(b**3*x**3)*exp(3*a*b**2*x**2)*exp(3*a**2*b*x),
x)
```

3.211 $\int e^{a^3+3a^2bx+3ab^2x^2+b^3x^3}x\,dx$

Optimal. Leaf size=80

$$\frac{a(a+bx)\Gamma\left(\frac{1}{3},-(a+bx)^3\right)}{3b^2\sqrt[3]{-(a+bx)^3}}-\frac{(a+bx)^2\Gamma\left(\frac{2}{3},-(a+bx)^3\right)}{3b^2\left(-(a+bx)^3\right)^{2/3}}$$

```
[Out] 1/3*a*(b*x+a)*GAMMA(1/3,-(b*x+a)^3)/b^2/(-(b*x+a)^3)^(1/3)-1/3*(b*x+a)^2*GA
MMA(2/3,-(b*x+a)^3)/b^2/(-(b*x+a)^3)^(2/3)
```

Rubi [A] time = 0.07, antiderivative size = 80, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.129, Rules used = {2227, 2226, 2208, 2218}

$$\frac{a(a+bx)\text{Gamma}\left(\frac{1}{3},-(a+bx)^3\right)}{3b^2\sqrt[3]{-(a+bx)^3}}-\frac{(a+bx)^2\text{Gamma}\left(\frac{2}{3},-(a+bx)^3\right)}{3b^2\left(-(a+bx)^3\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In] Int[E^(a^3 + 3*a^2*b*x + 3*a*b^2*x^2 + b^3*x^3)*x,x]
```

```
[Out] (a*(a + b*x)*Gamma[1/3, -(a + b*x)^3])/(3*b^2*(-(a + b*x)^3)^(1/3)) - ((a +
 b*x)^2*Gamma[2/3, -(a + b*x)^3])/(3*b^2*(-(a + b*x)^3)^(2/3))
```

Rule 2208

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> -Simp[(F^a
*(c + d*x)*Gamma[1/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x)^n*Log[F
]))^(1/n)), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2226

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rule 2227

```
Int[(u_.)*(F_)^((a_.) + (b_.)*(v_)), x_Symbol] :> Int[u*F^(a + b*NormalizeP
owerOfLinear[v, x]), x] /; FreeQ[{F, a, b}, x] && PolynomialQ[u, x] && Powe
rOfLinearQ[v, x] &&  !PowerOfLinearMatchQ[v, x]
```

Rubi steps

$$\begin{aligned}\int e^{a^3+3a^2bx+3ab^2x^2+b^3x^3}x\,dx &= \int e^{(a+bx)^3}x\,dx\\ &= \int\left(-\frac{ae^{(a+bx)^3}}{b}+\frac{e^{(a+bx)^3}(a+bx)}{b}\right)dx\\ &= \frac{\int e^{(a+bx)^3}(a+bx)\,dx}{b}-\frac{a\int e^{(a+bx)^3}\,dx}{b}\\ &= \frac{a(a+bx)\Gamma\left(\frac{1}{3},-(a+bx)^3\right)}{3b^2\sqrt[3]{-(a+bx)^3}}-\frac{(a+bx)^2\Gamma\left(\frac{2}{3},-(a+bx)^3\right)}{3b^2\left(-(a+bx)^3\right)^{2/3}}\end{aligned}$$

Mathematica [A] time = 0.03, size = 74, normalized size = 0.92

$$\frac{(a+bx)\left(a\sqrt[3]{-(a+bx)^3}\,\Gamma\left(\frac{1}{3},-(a+bx)^3\right)-(a+bx)\Gamma\left(\frac{2}{3},-(a+bx)^3\right)\right)}{3b^2\left(-(a+bx)^3\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a^3 + 3*a^2*b*x + 3*a*b^2*x^2 + b^3*x^3)*x,x]
```

```
[Out] ((a + b*x)*(a*(-(a + b*x)^3)^(1/3)*Gamma[1/3, -(a + b*x)^3] - (a + b*x)*Gam
ma[2/3, -(a + b*x)^3]))/(3*b^2*(-(a + b*x)^3)^(2/3))
```

fricas [A] time = 0.43, size = 89, normalized size = 1.11

$$-\frac{\left(-b^3\right)^{\frac{2}{3}}a\Gamma\left(\frac{1}{3},-b^3x^3-3\,ab^2x^2-3\,a^2bx-a^3\right)-\left(-b^3\right)^{\frac{1}{3}}b\Gamma\left(\frac{2}{3},-b^3x^3-3\,ab^2x^2-3\,a^2bx-a^3\right)}{3\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x,x, algorithm="fricas")
```

```
[Out] -1/3*((-b^3)^(2/3)*a*gamma(1/3, -b^3*x^3 - 3*a*b^2*x^2 - 3*a^2*b*x - a^3) -
 (-b^3)^(1/3)*b*gamma(2/3, -b^3*x^3 - 3*a*b^2*x^2 - 3*a^2*b*x - a^3))/b^4
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int xe^{\left(b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x,x, algorithm="giac")
[Out] integrate(x*e^(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3), x)
```

maple [F] time = 0.03, size = 0, normalized size = 0.00

$$\int x\,\mathrm{e}^{b^3x^3+3a\,b^2x^2+3a^2bx+a^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x,x)
[Out] int(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int xe^{\left(b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x,x, algorithm="maxima")
[Out] integrate(x*e^(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int x\,\mathrm{e}^{a^3+3\,a^2\,b\,x+3\,a\,b^2\,x^2+b^3\,x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*exp(a^3 + b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x),x)
[Out] int(x*exp(a^3 + b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$e^{a^3}\int xe^{b^3x^3}e^{3ab^2x^2}e^{3a^2bx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b**3*x**3+3*a*b**2*x**2+3*a**2*b*x+a**3)*x,x)
[Out] exp(a**3)*Integral(x*exp(b**3*x**3)*exp(3*a*b**2*x**2)*exp(3*a**2*b*x), x)
```

3.212 $\int e^{a^3+3a^2bx+3ab^2x^2+b^3x^3}\,dx$

Optimal. Leaf size=38

$$-\frac{(a+bx)\Gamma\left(\frac{1}{3},-(a+bx)^3\right)}{3b\sqrt[3]{-(a+bx)^3}}$$

```
[Out] -1/3*(b*x+a)*GAMMA(1/3,-(b*x+a)^3)/b/(-(b*x+a)^3)^(1/3)
```

Rubi [A] time = 0.01, antiderivative size = 38, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.069, Rules used = {2227, 2208}

$$-\frac{(a+bx)\text{Gamma}\left(\frac{1}{3},-(a+bx)^3\right)}{3b\sqrt[3]{-(a+bx)^3}}$$

Antiderivative was successfully verified.

```
[In] Int[E^(a^3 + 3*a^2*b*x + 3*a*b^2*x^2 + b^3*x^3),x]
```

```
[Out] -((a + b*x)*Gamma[1/3, -(a + b*x)^3])/(3*b*(-(a + b*x)^3)^(1/3))
```

Rule 2208

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> -Simp[(F^a
*(c + d*x)*Gamma[1/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x)^n*Log[F
]))^(1/n)), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rule 2227

```
Int[(u_.)*(F_)^((a_.) + (b_.)*(v_)), x_Symbol] :> Int[u*F^(a + b*NormalizeP
owerOfLinear[v, x]), x] /; FreeQ[{F, a, b}, x] && PolynomialQ[u, x] && Powe
rOfLinearQ[v, x] &&  !PowerOfLinearMatchQ[v, x]
```

Rubi steps

$$\begin{aligned}\int e^{a^3+3a^2bx+3ab^2x^2+b^3x^3}\,dx &= \int e^{(a+bx)^3}\,dx\\ &= -\frac{(a+bx)\Gamma\left(\frac{1}{3},-(a+bx)^3\right)}{3b\sqrt[3]{-(a+bx)^3}}\end{aligned}$$

Mathematica [A] time = 0.01, size = 38, normalized size = 1.00

$$-\frac{(a+bx)\Gamma\left(\frac{1}{3},-(a+bx)^3\right)}{3b\sqrt[3]{-(a+bx)^3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a^3 + 3*a^2*b*x + 3*a*b^2*x^2 + b^3*x^3),x]
[Out] -1/3*((a + b*x)*Gamma[1/3, -(a + b*x)^3])/(b*(-(a + b*x)^3)^(1/3))
```

fricas [A] time = 0.43, size = 44, normalized size = 1.16

$$\frac{\left(-b^3\right)^{\frac{2}{3}}\Gamma\left(\frac{1}{3},-b^3x^3-3\,ab^2x^2-3\,a^2bx-a^3\right)}{3\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3),x, algorithm="fricas")
[Out] 1/3*(-b^3)^(2/3)*gamma(1/3, -b^3*x^3 - 3*a*b^2*x^2 - 3*a^2*b*x - a^3)/b^3
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int e^{\left(b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3),x, algorithm="giac")
[Out] integrate(e^(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3), x)
```

maple [F] time = 0.03, size = 0, normalized size = 0.00

$$\int \mathrm{e}^{b^3x^3+3a\,b^2x^2+3a^2bx+a^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3),x)
[Out] int(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int e^{\left(b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3),x, algorithm="maxima")
[Out] integrate(e^(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.03

$$\int \mathrm{e}^{a^3+3\,a^2\,b\,x+3\,a\,b^2\,x^2+b^3\,x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(a^3 + b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x),x)
[Out] int(exp(a^3 + b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$e^{a^3}\int e^{b^3x^3}e^{3ab^2x^2}e^{3a^2bx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b**3*x**3+3*a*b**2*x**2+3*a**2*b*x+a**3),x)
[Out] exp(a**3)*Integral(exp(b**3*x**3)*exp(3*a*b**2*x**2)*exp(3*a**2*b*x), x)
```

3.213 $\int \frac{e^{a^3+3a^2bx+3ab^2x^2+b^3x^3}}{x}\,dx$

Optimal. Leaf size=36

$$\text{Int}\left(\frac{e^{a^3+3a^2bx+3ab^2x^2+b^3x^3}}{x},x\right)$$

```
[Out] CannotIntegrate(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)/x,x)
```

Rubi [A] time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{e^{a^3+3a^2bx+3ab^2x^2+b^3x^3}}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[E^(a^3 + 3*a^2*b*x + 3*a*b^2*x^2 + b^3*x^3)/x,x]
[Out] Defer[Int][E^(a^3 + 3*a^2*b*x + 3*a*b^2*x^2 + b^3*x^3)/x, x]
```

Rubi steps

$$\int \frac{e^{a^3+3a^2bx+3ab^2x^2+b^3x^3}}{x}\,dx = \int \frac{e^{a^3+3a^2bx+3ab^2x^2+b^3x^3}}{x}\,dx$$

Mathematica [A] time = 0.24, size = 0, normalized size = 0.00

$$\int \frac{e^{a^3+3a^2bx+3ab^2x^2+b^3x^3}}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[E^(a^3 + 3*a^2*b*x + 3*a*b^2*x^2 + b^3*x^3)/x,x]
[Out] Integrate[E^(a^3 + 3*a^2*b*x + 3*a*b^2*x^2 + b^3*x^3)/x, x]
```

fricas [A] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{e^{\left(b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3\right)}}{x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)/x,x, algorithm="fricas")
[Out] integral(e^(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3)/x, x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{\left(b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3\right)}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)/x,x, algorithm="giac")
[Out] integrate(e^(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3)/x, x)
```

maple [A] time = 0.03, size = 0, normalized size = 0.00

$$\int \frac{{\mathrm e}^{b^3x^3+3a\,b^2x^2+3a^2bx+a^3}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)/x,x)
[Out] int(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)/x,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{\left(b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3\right)}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)/x,x, algorithm="maxima")
[Out] integrate(e^(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3)/x, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{{\mathrm{e}}^{a^3+3\,a^2\,b\,x+3\,a\,b^2\,x^2+b^3\,x^3}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(a^3 + b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x)/x,x)
[Out] int(exp(a^3 + b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x)/x, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$e^{a^3}\int \frac{e^{b^3x^3}e^{3ab^2x^2}e^{3a^2bx}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b**3*x**3+3*a*b**2*x**2+3*a**2*b*x+a**3)/x,x)
```

```
[Out] exp(a**3)*Integral(exp(b**3*x**3)*exp(3*a*b**2*x**2)*exp(3*a**2*b*x)/x, x)
```

3.214 $\int e^{a^3+3a^2bx+3ab^2x^2+b^3x^3}x^m\,dx$

Optimal. Leaf size=36

$$\operatorname{Int}\left(x^m e^{a^3+3a^2bx+3ab^2x^2+b^3x^3},x\right)$$

```
[Out] CannotIntegrate(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x^m,x)
```

Rubi [A] time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int e^{a^3+3a^2bx+3ab^2x^2+b^3x^3}x^m\,dx$$

Verification is Not applicable to the result.

```
[In] Int[E^(a^3 + 3*a^2*b*x + 3*a*b^2*x^2 + b^3*x^3)*x^m,x]
[Out] Defer[Int][E^(a^3 + 3*a^2*b*x + 3*a*b^2*x^2 + b^3*x^3)*x^m, x]
```

Rubi steps

$$\int e^{a^3+3a^2bx+3ab^2x^2+b^3x^3}x^m\,dx=\int e^{a^3+3a^2bx+3ab^2x^2+b^3x^3}x^m\,dx$$

Mathematica [A] time = 0.19, size = 0, normalized size = 0.00

$$\int e^{a^3+3a^2bx+3ab^2x^2+b^3x^3}x^m\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[E^(a^3 + 3*a^2*b*x + 3*a*b^2*x^2 + b^3*x^3)*x^m,x]
[Out] Integrate[E^(a^3 + 3*a^2*b*x + 3*a*b^2*x^2 + b^3*x^3)*x^m, x]
```

fricas [A] time = 0.42, size = 0, normalized size = 0.00

$$\operatorname{integral}\left(x^m e^{\left(b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x^m,x, algorithm="fricas")
[Out] integral(x^m*e^(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int x^m e^{\left(b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x^m,x, algorithm="giac")
[Out] integrate(x^m*e^(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3), x)
```

maple [A] time = 0.05, size = 0, normalized size = 0.00

$$\int x^m \mathrm{e}^{b^3x^3+3a\,b^2x^2+3a^2bx+a^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x^m,x)
[Out] int(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x^m,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int x^m e^{\left(b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b^3*x^3+3*a*b^2*x^2+3*a^2*b*x+a^3)*x^m,x, algorithm="maxima")
[Out] integrate(x^m*e^(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int x^m\,\mathrm{e}^{a^3+3\,a^2\,b\,x+3\,a\,b^2\,x^2+b^3\,x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*exp(a^3 + b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x),x)
[Out] int(x^m*exp(a^3 + b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b**3*x**3+3*a*b**2*x**2+3*a**2*b*x+a**3)*x**m,x)
[Out] Timed out
```

3.215 $\int e^{\sqrt{5+3x}}\,dx$

Optimal. Leaf size=40

$$\frac{2}{3}e^{\sqrt{3x+5}}\sqrt{3x+5}-\frac{2}{3}e^{\sqrt{3x+5}}$$

```
[Out] -2/3*exp((5+3*x)^(1/2))+2/3*exp((5+3*x)^(1/2))*(5+3*x)^(1/2)
```

Rubi [A] time = 0.01, antiderivative size = 40, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {2207, 2176, 2194}

$$\frac{2}{3}e^{\sqrt{3x+5}}\sqrt{3x+5}-\frac{2}{3}e^{\sqrt{3x+5}}$$

Antiderivative was successfully verified.

```
[In] Int[E^Sqrt[5 + 3*x],x]
```

```
[Out] (-2*E^Sqrt[5 + 3*x])/3 + (2*E^Sqrt[5 + 3*x]*Sqrt[5 + 3*x])/3
```

Rule 2176

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_.), x_Symbol] :> Simp[((c + d*x)^m*(b*F^(g*(e + f*x)))^n)/(f*g*n*Log[F]),
x] - Dist[(d*m)/(f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*(b*F^(g*(e + f*x)))^n
, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && GtQ[m, 0] && IntegerQ[2*m
] &&  !$UseGamma === True
```

Rule 2194

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 2207

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> With[{k =
Denominator[n]}, Dist[k/d, Subst[Int[x^(k - 1)*F^(a + b*x^(k*n)), x], x, (c
 + d*x)^(1/k)], x]] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] &&  !Inte
gerQ[n]
```

Rubi steps

$$
\begin{aligned}
\int e^{\sqrt{5+3x}}\,dx &= \frac{2}{3}\operatorname{Subst}\left(\int e^x x\,dx, x, \sqrt{5+3x}\right) \\
&= \frac{2}{3}e^{\sqrt{5+3x}}\sqrt{5+3x} - \frac{2}{3}\operatorname{Subst}\left(\int e^x\,dx, x, \sqrt{5+3x}\right) \\
&= -\frac{2}{3}e^{\sqrt{5+3x}} + \frac{2}{3}e^{\sqrt{5+3x}}\sqrt{5+3x}
\end{aligned}
$$

Mathematica [**A**] time = 0.01, size = 26, normalized size = 0.65

$$\frac{2}{3}e^{\sqrt{3x+5}}\left(\sqrt{3x+5}-1\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^Sqrt[5 + 3*x],x]
[Out] (2*E^Sqrt[5 + 3*x]*(-1 + Sqrt[5 + 3*x]))/3
```

fricas [**A**] time = 0.41, size = 19, normalized size = 0.48

$$\frac{2}{3}\left(\sqrt{3x+5}-1\right)e^{\left(\sqrt{3x+5}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((5+3*x)^(1/2)),x, algorithm="fricas")
[Out] 2/3*(sqrt(3*x + 5) - 1)*e^(sqrt(3*x + 5))
```

giac [**A**] time = 0.21, size = 19, normalized size = 0.48

$$\frac{2}{3}\left(\sqrt{3x+5}-1\right)e^{\left(\sqrt{3x+5}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((5+3*x)^(1/2)),x, algorithm="giac")
[Out] 2/3*(sqrt(3*x + 5) - 1)*e^(sqrt(3*x + 5))
```

maple [**A**] time = 0.01, size = 29, normalized size = 0.72

$$-\frac{2\,\mathrm{e}^{\sqrt{3x+5}}}{3}+\frac{2\sqrt{3x+5}\;\mathrm{e}^{\sqrt{3x+5}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp((3*x+5)^(1/2)),x)
```

```
[Out] -2/3*exp((3*x+5)^(1/2))+2/3*exp((3*x+5)^(1/2))*(3*x+5)^(1/2)
```

maxima [A] time = 0.74, size = 19, normalized size = 0.48

$$\frac{2}{3}\left(\sqrt{3\,x+5}\,-1\right)e^{\left(\sqrt{3\,x+5}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((5+3*x)^(1/2)),x, algorithm="maxima")
```

```
[Out] 2/3*(sqrt(3*x + 5) - 1)*e^(sqrt(3*x + 5))
```

mupad [B] time = 0.09, size = 19, normalized size = 0.48

$$\frac{2\,\mathrm{e}^{\sqrt{3\,x+5}}\,\left(\sqrt{3\,x+5}\,-1\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp((3*x + 5)^(1/2)),x)
```

```
[Out] (2*exp((3*x + 5)^(1/2))*((3*x + 5)^(1/2) - 1))/3
```

sympy [A] time = 0.21, size = 34, normalized size = 0.85

$$\frac{2\sqrt{3x+5}\,e^{\sqrt{3x+5}}}{3}-\frac{2e^{\sqrt{3x+5}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((5+3*x)**(1/2)),x)
```

```
[Out] 2*sqrt(3*x + 5)*exp(sqrt(3*x + 5))/3 - 2*exp(sqrt(3*x + 5))/3
```

3.216 $\int f^{\frac{c}{a+bx}} x^4 \, dx$

Optimal. Leaf size=291

$$-\frac{a^4 c \log(f) \text{Ei}\left(\frac{c \log(f)}{a+bx}\right)}{b^5}+\frac{a^4 (a+bx) f^{\frac{c}{a+bx}}}{b^5}+\frac{2 a^3 c^2 \log^2(f) \text{Ei}\left(\frac{c \log(f)}{a+bx}\right)}{b^5}-\frac{2 a^3 (a+bx)^2 f^{\frac{c}{a+bx}}}{b^5}-\frac{2 a^3 c \log(f) (a+bx) f^{\frac{c}{a+b}}}{b^5}$$

```
[Out] a^4*f^(c/(b*x+a))*(b*x+a)/b^5-2*a^3*f^(c/(b*x+a))*(b*x+a)^2/b^5+2*a^2*f^(c/
(b*x+a))*(b*x+a)^3/b^5-2*a^3*c*f^(c/(b*x+a))*(b*x+a)*ln(f)/b^5+a^2*c*f^(c/(
b*x+a))*(b*x+a)^2*ln(f)/b^5-a^4*c*Ei(c*ln(f)/(b*x+a))*ln(f)/b^5+a^2*c^2*f^(
c/(b*x+a))*(b*x+a)*ln(f)^2/b^5+2*a^3*c^2*Ei(c*ln(f)/(b*x+a))*ln(f)^2/b^5-a^
2*c^3*Ei(c*ln(f)/(b*x+a))*ln(f)^3/b^5-4*a*(b*x+a)^4*Ei(5,-c*ln(f)/(b*x+a))/
b^5+(b*x+a)^5*Ei(6,-c*ln(f)/(b*x+a))/b^5
```

Rubi [A] time = 0.29, antiderivative size = 291, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {2226, 2206, 2210, 2214, 2218}

$$-\frac{c^5 \log^5(f) \text{Gamma}\left(-5,-\frac{c \log(f)}{a+bx}\right)}{b^5}-\frac{4 a c^4 \log^4(f) \text{Gamma}\left(-4,-\frac{c \log(f)}{a+bx}\right)}{b^5}-\frac{a^2 c^3 \log^3(f) \text{Ei}\left(\frac{c \log(f)}{a+bx}\right)}{b^5}+\frac{2 a^3 c^2 \log^2(f)}{b^5}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c/(a + b*x))*x^4,x]
```

```
[Out] (a^4*f^(c/(a + b*x))*(a + b*x))/b^5 - (2*a^3*f^(c/(a + b*x))*(a + b*x)^2)/b
^5 + (2*a^2*f^(c/(a + b*x))*(a + b*x)^3)/b^5 - (2*a^3*c*f^(c/(a + b*x))*(a
+ b*x)*Log[f])/b^5 + (a^2*c*f^(c/(a + b*x))*(a + b*x)^2*Log[f])/b^5 - (a^4*
c*ExpIntegralEi[(c*Log[f])/(a + b*x)]*Log[f])/b^5 + (a^2*c^2*f^(c/(a + b*x)
)*(a + b*x)*Log[f]^2)/b^5 + (2*a^3*c^2*ExpIntegralEi[(c*Log[f])/(a + b*x)]*
Log[f]^2)/b^5 - (a^2*c^3*ExpIntegralEi[(c*Log[f])/(a + b*x)]*Log[f]^3)/b^5
- (4*a*c^4*Gamma[-4, -((c*Log[f])/(a + b*x))]*Log[f]^4)/b^5 - (c^5*Gamma[-5
, -((c*Log[f])/(a + b*x))]*Log[f]^5)/b^5
```

Rule 2206

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[((c +
 d*x)*F^(a + b*(c + d*x)^n))/d, x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
```

```
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2226

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int f^{\frac{c}{a+bx}} x^4 \, dx = \int \left(\frac{a^4 f^{\frac{c}{a+bx}}}{b^4} - \frac{4a^3 f^{\frac{c}{a+bx}}(a+bx)}{b^4} + \frac{6a^2 f^{\frac{c}{a+bx}}(a+bx)^2}{b^4} - \frac{4af^{\frac{c}{a+bx}}(a+bx)^3}{b^4} + \frac{f^{\frac{c}{a+bx}}(a+bx)^4}{b^4} \right) dx$$

$$= \frac{\int f^{\frac{c}{a+bx}}(a+bx)^4 \, dx}{b^4} - \frac{(4a)\int f^{\frac{c}{a+bx}}(a+bx)^3 \, dx}{b^4} + \frac{(6a^2)\int f^{\frac{c}{a+bx}}(a+bx)^2 \, dx}{b^4} - \frac{(4a^3)\int f^{\frac{c}{a+bx}}(a+b}{b^4}$$

$$= \frac{a^4 f^{\frac{c}{a+bx}}(a+bx)}{b^5} - \frac{2a^3 f^{\frac{c}{a+bx}}(a+bx)^2}{b^5} + \frac{2a^2 f^{\frac{c}{a+bx}}(a+bx)^3}{b^5} - \frac{4ac^4\Gamma\left(-4, -\frac{c\log(f)}{a+bx}\right)\log^4(f)}{b^5} - \frac{c^5\Gamma\left(\right.}{}$$

$$= \frac{a^4 f^{\frac{c}{a+bx}}(a+bx)}{b^5} - \frac{2a^3 f^{\frac{c}{a+bx}}(a+bx)^2}{b^5} + \frac{2a^2 f^{\frac{c}{a+bx}}(a+bx)^3}{b^5} - \frac{2a^3 cf^{\frac{c}{a+bx}}(a+bx)\log(f)}{b^5} + \frac{a^2cf^{\frac{c}{a+bx}}}{}$$

$$= \frac{a^4 f^{\frac{c}{a+bx}}(a+bx)}{b^5} - \frac{2a^3 f^{\frac{c}{a+bx}}(a+bx)^2}{b^5} + \frac{2a^2 f^{\frac{c}{a+bx}}(a+bx)^3}{b^5} - \frac{2a^3 cf^{\frac{c}{a+bx}}(a+bx)\log(f)}{b^5} + \frac{a^2cf^{\frac{c}{a+bx}}}{}$$

$$= \frac{a^4 f^{\frac{c}{a+bx}}(a+bx)}{b^5} - \frac{2a^3 f^{\frac{c}{a+bx}}(a+bx)^2}{b^5} + \frac{2a^2 f^{\frac{c}{a+bx}}(a+bx)^3}{b^5} - \frac{2a^3 cf^{\frac{c}{a+bx}}(a+bx)\log(f)}{b^5} + \frac{a^2cf^{\frac{c}{a+bx}}}{}$$

Mathematica [A] time = 0.20, size = 241, normalized size = 0.83

$$\frac{a\left(24a^4 - 154a^3c\log(f) + 102a^2c^2\log^2(f) - 19ac^3\log^3(f) + c^4\log^4(f)\right)f^{\frac{c}{a+bx}}}{120b^5} + \frac{bxf^{\frac{c}{a+bx}}\left(2c^2\log^2(f)\left(43a^2 - 7ab\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c/(a + b*x))*x^4,x]
```

```
[Out] (a*f^(c/(a + b*x))*(24*a^4 - 154*a^3*c*Log[f] + 102*a^2*c^2*Log[f]^2 - 19*a
*c^3*Log[f]^3 + c^4*Log[f]^4))/(120*b^5) + (-(c*ExpIntegralEi[(c*Log[f])/(a
 + b*x)]*Log[f]*(120*a^4 - 240*a^3*c*Log[f] + 120*a^2*c^2*Log[f]^2 - 20*a*c
^3*Log[f]^3 + c^4*Log[f]^4)) + b*f^(c/(a + b*x))*x*(24*b^4*x^4 + 2*c*(-48*a
^3 + 18*a^2*b*x - 8*a*b^2*x^2 + 3*b^3*x^3)*Log[f] + 2*c^2*(43*a^2 - 7*a*b*x
 + b^2*x^2)*Log[f]^2 + c^3*(-18*a + b*x)*Log[f]^3 + c^4*Log[f]^4))/(120*b^5
)
```

fricas [B] time = 0.43, size = 243, normalized size = 0.84

$$\frac{\left(24\,b^5x^5 + 24\,a^5 + \left(bc^4x + ac^4\right)\log(f)^4 + \left(b^2c^3x^2 - 18\,abc^3x - 19\,a^2c^3\right)\log(f)^3 + 2\left(b^3c^2x^3 - 7\,ab^2c^2x^2 + 43\,a^2bc\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a))*x^4,x, algorithm="fricas")
```

```
[Out] 1/120*((24*b^5*x^5 + 24*a^5 + (b*c^4*x + a*c^4)*log(f)^4 + (b^2*c^3*x^2 - 1
8*a*b*c^3*x - 19*a^2*c^3)*log(f)^3 + 2*(b^3*c^2*x^3 - 7*a*b^2*c^2*x^2 + 43*
a^2*b*c^2*x + 51*a^3*c^2)*log(f)^2 + 2*(3*b^4*c*x^4 - 8*a*b^3*c*x^3 + 18*a^
2*b^2*c*x^2 - 48*a^3*b*c*x - 77*a^4*c)*log(f))*f^(c/(b*x + a)) - (c^5*log(f
)^5 - 20*a*c^4*log(f)^4 + 120*a^2*c^3*log(f)^3 - 240*a^3*c^2*log(f)^2 + 120
*a^4*c*log(f))*Ei(c*log(f)/(b*x + a)))/b^5
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{bx+a}} x^4 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a))*x^4,x, algorithm="giac")
```

```
[Out] integrate(f^(c/(b*x + a))*x^4, x)
```

maple [A] time = 0.13, size = 517, normalized size = 1.78

$$\frac{c\,x^4 f^{\frac{c}{bx+a}} \ln(f)}{20b}+\frac{c^2x^3 f^{\frac{c}{bx+a}} \ln(f)^2}{60b^2}+\frac{c^3x^2 f^{\frac{c}{bx+a}} \ln(f)^3}{120b^3}+\frac{c^4x\, f^{\frac{c}{bx+a}} \ln(f)^4}{120b^4}+\frac{c^5 \operatorname{Ei}\left(1,-\frac{c\ln(f)}{bx+a}\right)\ln(f)^5}{120b^5}+\frac{x^5 f^{\frac{c}{bx+a}}}{5}-\frac{2ac\,x}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(b*x+a))*x^4,x)
```

```
[Out] 1/20*c*ln(f)/b*f^(c/(b*x+a))*x^4+1/120*c^5*ln(f)^5/b^5*Ei(1,-c*ln(f)/(b*x+a
))-2*c^2*ln(f)^2/b^5*a^3*Ei(1,-c*ln(f)/(b*x+a))-1/6*c^4*ln(f)^4/b^5*a*Ei(1,
-c*ln(f)/(b*x+a))+1/5/b^5*a^5*f^(c/(b*x+a))-7/60*c^2*ln(f)^2/b^3*f^(c/(b*x+
a))*a*x^2+43/60*c^2*ln(f)^2/b^4*f^(c/(b*x+a))*a^2*x-3/20*c^3*ln(f)^3/b^4*f^
(c/(b*x+a))*a*x+c*ln(f)/b^5*a^4*Ei(1,-c*ln(f)/(b*x+a))-77/60*c*ln(f)/b^5*f^
(c/(b*x+a))*a^4+17/20*c^2*ln(f)^2/b^5*f^(c/(b*x+a))*a^3-19/120*c^3*ln(f)^3/
b^5*f^(c/(b*x+a))*a^2+1/120*c^4*ln(f)^4/b^5*f^(c/(b*x+a))*a-2/15*c*ln(f)/b^
2*f^(c/(b*x+a))*a*x^3+3/10*c*ln(f)/b^3*f^(c/(b*x+a))*a^2*x^2-4/5*c*ln(f)/b^
4*f^(c/(b*x+a))*a^3*x+c^3*ln(f)^3/b^5*a^2*Ei(1,-c*ln(f)/(b*x+a))+1/5*f^(c/(
b*x+a))*x^5+1/60*c^2*ln(f)^2/b^2*f^(c/(b*x+a))*x^3+1/120*c^3*ln(f)^3/b^3*f^
(c/(b*x+a))*x^2+1/120*c^4*ln(f)^4/b^4*f^(c/(b*x+a))*x
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\left(24\,b^4x^5 + 6\,b^3cx^4\log(f) + 2\left(b^2c^2\log(f)^2 - 8\,ab^2c\log(f)\right)x^3 + \left(bc^3\log(f)^3 - 14\,abc^2\log(f)^2 + 36\,a^2bc\log(f\right.}{120\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a))*x^4,x, algorithm="maxima")
```

```
[Out] 1/120*(24*b^4*x^5 + 6*b^3*c*x^4*log(f) + 2*(b^2*c^2*log(f)^2 - 8*a*b^2*c*lo
g(f))*x^3 + (b*c^3*log(f)^3 - 14*a*b*c^2*log(f)^2 + 36*a^2*b*c*log(f))*x^2
+ (c^4*log(f)^4 - 18*a*c^3*log(f)^3 + 86*a^2*c^2*log(f)^2 - 96*a^3*c*log(f)
)*x)*f^(c/(b*x + a))/b^4 + integrate(-1/120*(a^2*c^4*log(f)^4 - 18*a^3*c^3*
log(f)^3 + 86*a^4*c^2*log(f)^2 - 96*a^5*c*log(f) - (b*c^5*log(f)^5 - 20*a*b
*c^4*log(f)^4 + 120*a^2*b*c^3*log(f)^3 - 240*a^3*b*c^2*log(f)^2 + 120*a^4*b
*c*log(f))*x)*f^(c/(b*x + a))/(b^6*x^2 + 2*a*b^5*x + a^2*b^4), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int f^{\frac{c}{a+b\,x}}\,x^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x))*x^4,x)
```

```
[Out] int(f^(c/(a + b*x))*x^4, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{a+bx}}x^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a))*x**4,x)
```

```
[Out] Integral(f**(c/(a + b*x))*x**4, x)
```

3.217 $\int f^{\frac{c}{a+bx}} x^3 \, dx$

Optimal. Leaf size=269

$$\frac{a^3 c \log(f)\text{Ei}\left(\frac{c\log(f)}{a+bx}\right)}{b^4}-\frac{a^3(a+bx)f^{\frac{c}{a+bx}}}{b^4}-\frac{3a^2c^2\log^2(f)\text{Ei}\left(\frac{c\log(f)}{a+bx}\right)}{2b^4}+\frac{3a^2(a+bx)^2f^{\frac{c}{a+bx}}}{2b^4}+\frac{3a^2c\log(f)(a+bx)f^{\frac{c}{a+b}}}{2b^4}$$

```
[Out] -a^3*f^(c/(b*x+a))*(b*x+a)/b^4+3/2*a^2*f^(c/(b*x+a))*(b*x+a)^2/b^4-a*f^(c/(
b*x+a))*(b*x+a)^3/b^4+3/2*a^2*c*f^(c/(b*x+a))*(b*x+a)*ln(f)/b^4-1/2*a*c*f^(
c/(b*x+a))*(b*x+a)^2*ln(f)/b^4+a^3*c*Ei(c*ln(f)/(b*x+a))*ln(f)/b^4-1/2*a*c^
2*f^(c/(b*x+a))*(b*x+a)*ln(f)^2/b^4-3/2*a^2*c^2*Ei(c*ln(f)/(b*x+a))*ln(f)^2
/b^4+1/2*a*c^3*Ei(c*ln(f)/(b*x+a))*ln(f)^3/b^4+(b*x+a)^4*Ei(5,-c*ln(f)/(b*x
+a))/b^4
```

Rubi [A] time = 0.25, antiderivative size = 269, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {2226, 2206, 2210, 2214, 2218}

$$\frac{c^4\log^4(f)\text{Gamma}\left(-4,-\frac{c\log(f)}{a+bx}\right)}{b^4}-\frac{3a^2c^2\log^2(f)\text{Ei}\left(\frac{c\log(f)}{a+bx}\right)}{2b^4}+\frac{a^3c\log(f)\text{Ei}\left(\frac{c\log(f)}{a+bx}\right)}{b^4}+\frac{3a^2(a+bx)^2f^{\frac{c}{a+bx}}}{2b^4}-\frac{a^3(a+}{}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c/(a + b*x))*x^3,x]
```

```
[Out] -((a^3*f^(c/(a + b*x))*(a + b*x))/b^4) + (3*a^2*f^(c/(a + b*x))*(a + b*x)^2
)/(2*b^4) - (a*f^(c/(a + b*x))*(a + b*x)^3)/b^4 + (3*a^2*c*f^(c/(a + b*x))*
(a + b*x)*Log[f])/(2*b^4) - (a*c*f^(c/(a + b*x))*(a + b*x)^2*Log[f])/(2*b^4
) + (a^3*c*ExpIntegralEi[(c*Log[f])/(a + b*x)]*Log[f])/b^4 - (a*c^2*f^(c/(a
 + b*x))*(a + b*x)*Log[f]^2)/(2*b^4) - (3*a^2*c^2*ExpIntegralEi[(c*Log[f])/
(a + b*x)]*Log[f]^2)/(2*b^4) + (a*c^3*ExpIntegralEi[(c*Log[f])/(a + b*x)]*L
og[f]^3)/(2*b^4) + (c^4*Gamma[-4, -((c*Log[f])/(a + b*x))]*Log[f]^4)/b^4
```

Rule 2206

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[((c +
 d*x)*F^(a + b*(c + d*x)^n))/d, x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
```

```
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2226

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int f^{\frac{c}{a+bx}}x^3\,dx = \int \left(-\frac{a^3 f^{\frac{c}{a+bx}}}{b^3} + \frac{3a^2 f^{\frac{c}{a+bx}}(a+bx)}{b^3} - \frac{3af^{\frac{c}{a+bx}}(a+bx)^2}{b^3} + \frac{f^{\frac{c}{a+bx}}(a+bx)^3}{b^3}\right)dx$$

$$= \frac{\int f^{\frac{c}{a+bx}}(a+bx)^3\,dx}{b^3} - \frac{(3a)\int f^{\frac{c}{a+bx}}(a+bx)^2\,dx}{b^3} + \frac{(3a^2)\int f^{\frac{c}{a+bx}}(a+bx)\,dx}{b^3} - \frac{a^3\int f^{\frac{c}{a+bx}}\,dx}{b^3}$$

$$= -\frac{a^3 f^{\frac{c}{a+bx}}(a+bx)}{b^4} + \frac{3a^2 f^{\frac{c}{a+bx}}(a+bx)^2}{2b^4} - \frac{af^{\frac{c}{a+bx}}(a+bx)^3}{b^4} + \frac{c^4\Gamma\left(-4,-\frac{c\log(f)}{a+bx}\right)\log^4(f)}{b^4} - \frac{(ac\log}{}$$

$$= -\frac{a^3 f^{\frac{c}{a+bx}}(a+bx)}{b^4} + \frac{3a^2 f^{\frac{c}{a+bx}}(a+bx)^2}{2b^4} - \frac{af^{\frac{c}{a+bx}}(a+bx)^3}{b^4} + \frac{3a^2cf^{\frac{c}{a+bx}}(a+bx)\log(f)}{2b^4} - \frac{acf^{\frac{c}{a+bx}}}{}$$

$$= -\frac{a^3 f^{\frac{c}{a+bx}}(a+bx)}{b^4} + \frac{3a^2 f^{\frac{c}{a+bx}}(a+bx)^2}{2b^4} - \frac{af^{\frac{c}{a+bx}}(a+bx)^3}{b^4} + \frac{3a^2cf^{\frac{c}{a+bx}}(a+bx)\log(f)}{2b^4} - \frac{acf^{\frac{c}{a+bx}}}{}$$

$$= -\frac{a^3 f^{\frac{c}{a+bx}}(a+bx)}{b^4} + \frac{3a^2 f^{\frac{c}{a+bx}}(a+bx)^2}{2b^4} - \frac{af^{\frac{c}{a+bx}}(a+bx)^3}{b^4} + \frac{3a^2cf^{\frac{c}{a+bx}}(a+bx)\log(f)}{2b^4} - \frac{acf^{\frac{c}{a+bx}}}{}$$

Mathematica [A] time = 0.20, size = 179, normalized size = 0.67

$$\frac{bxf^{\frac{c}{a+bx}}\left(2c\log(f)\left(9a^2-3abx+b^2x^2\right)+c^2\log^2(f)(bx-10a)+6b^3x^3+c^3\log^3(f)\right)+c\log(f)\left(24a^3-36a^2c\log\right.}{24b^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c/(a + b*x))*x^3,x]
```

```
[Out] -1/24*(a*f^(c/(a + b*x))*(6*a^3 - 26*a^2*c*Log[f] + 11*a*c^2*Log[f]^2 - c^3
*Log[f]^3))/b^4 + (c*ExpIntegralEi[(c*Log[f])/(a + b*x)]*Log[f]*(24*a^3 - 3
6*a^2*c*Log[f] + 12*a*c^2*Log[f]^2 - c^3*Log[f]^3) + b*f^(c/(a + b*x))*x*(6
*b^3*x^3 + 2*c*(9*a^2 - 3*a*b*x + b^2*x^2)*Log[f] + c^2*(-10*a + b*x)*Log[f
]^2 + c^3*Log[f]^3))/(24*b^4)
```

fricas [B] time = 0.42, size = 171, normalized size = 0.64

$$\frac{\left(6\,b^4x^4-6\,a^4+\left(bc^3x+ac^3\right)\log(f)^3+\left(b^2c^2x^2-10\,abc^2x-11\,a^2c^2\right)\log(f)^2+2\left(b^3cx^3-3\,ab^2cx^2+9\,a^2bcx+\right.\right.}{24\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a))*x^3,x, algorithm="fricas")
```

```
[Out] 1/24*((6*b^4*x^4 - 6*a^4 + (b*c^3*x + a*c^3)*log(f)^3 + (b^2*c^2*x^2 - 10*a
*b*c^2*x - 11*a^2*c^2)*log(f)^2 + 2*(b^3*c*x^3 - 3*a*b^2*c*x^2 + 9*a^2*b*c*
x + 13*a^3*c)*log(f))*f^(c/(b*x + a)) - (c^4*log(f)^4 - 12*a*c^3*log(f)^3 +
 36*a^2*c^2*log(f)^2 - 24*a^3*c*log(f))*Ei(c*log(f)/(b*x + a)))/b^4
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{bx+a}}x^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a))*x^3,x, algorithm="giac")
```

```
[Out] integrate(f^(c/(b*x + a))*x^3, x)
```

maple [A] time = 0.12, size = 359, normalized size = 1.33

$$\frac{c\,x^3 f^{\frac{c}{bx+a}}\ln(f)}{12b}+\frac{c^2x^2 f^{\frac{c}{bx+a}}\ln(f)^2}{24b^2}+\frac{c^3x\,f^{\frac{c}{bx+a}}\ln(f)^3}{24b^3}+\frac{c^4\,\mathrm{Ei}\left(1,-\frac{c\ln(f)}{bx+a}\right)\ln(f)^4}{24b^4}+\frac{x^4 f^{\frac{c}{bx+a}}}{4}-\frac{ac\,x^2 f^{\frac{c}{bx+a}}\ln(f)}{4b^2}-\frac{5a\,c^2x\,f}{1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(1/(b*x+a)*c)*x^3,x)
```

```
[Out] 1/24*c^3*ln(f)^3/b^4*f^(1/(b*x+a)*c)*a-11/24*c^2*ln(f)^2/b^4*f^(1/(b*x+a)*c
)*a^2-1/4/b^4*f^(1/(b*x+a)*c)*a^4-1/4*c*ln(f)/b^2*f^(1/(b*x+a)*c)*a*x^2+3/4
*c*ln(f)/b^3*f^(1/(b*x+a)*c)*a^2*x+3/2*c^2*ln(f)^2/b^4*a^2*Ei(1,-1/(b*x+a)*
c*ln(f))+1/12*c*ln(f)/b*f^(1/(b*x+a)*c)*x^3+1/24*c^4*ln(f)^4/b^4*Ei(1,-1/(b
*x+a)*c*ln(f))+13/12*c*ln(f)/b^4*f^(1/(b*x+a)*c)*a^3-c*ln(f)/b^4*a^3*Ei(1,-
1/(b*x+a)*c*ln(f))-1/2*c^3*ln(f)^3/b^4*a*Ei(1,-1/(b*x+a)*c*ln(f))-5/12*c^2*
ln(f)^2/b^3*f^(1/(b*x+a)*c)*a*x+1/4*f^(1/(b*x+a)*c)*x^4+1/24*c^2*ln(f)^2/b^
2*f^(1/(b*x+a)*c)*x^2+1/24*c^3*ln(f)^3/b^3*f^(1/(b*x+a)*c)*x
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\left(6\,b^3x^4+2\,b^2cx^3\log(f)+\left(bc^2\log(f)^2-6\,abc\log(f)\right)x^2+\left(c^3\log(f)^3-10\,ac^2\log(f)^2+18\,a^2c\log(f)\right)x\right)f^{\frac{c}{bx+a}}}{24\,b^3}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a))*x^3,x, algorithm="maxima")
```

```
[Out] 1/24*(6*b^3*x^4 + 2*b^2*c*x^3*log(f) + (b*c^2*log(f)^2 - 6*a*b*c*log(f))*x^
2 + (c^3*log(f)^3 - 10*a*c^2*log(f)^2 + 18*a^2*c*log(f))*x)*f^(c/(b*x + a))
/b^3 - integrate(1/24*(a^2*c^3*log(f)^3 - 10*a^3*c^2*log(f)^2 + 18*a^4*c*lo
```

```
g(f) - (b*c^4*log(f)^4 - 12*a*b*c^3*log(f)^3 + 36*a^2*b*c^2*log(f)^2 - 24*a
^3*b*c*log(f))*x)*f^(c/(b*x + a))/(b^5*x^2 + 2*a*b^4*x + a^2*b^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int f^{\frac{c}{a+bx}} x^3 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x))*x^3,x)
[Out] int(f^(c/(a + b*x))*x^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{a+bx}} x^3 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a))*x**3,x)
[Out] Integral(f**(c/(a + b*x))*x**3, x)
```

3.218 $\int f^{\frac{c}{a+bx}} x^2 \, dx$

Optimal. Leaf size=229

$$-\frac{a^2 c \log(f) \text{Ei}\left(\frac{c\log(f)}{a+bx}\right)}{b^3}+\frac{a^2(a+bx)f^{\frac{c}{a+bx}}}{b^3}-\frac{c^3\log^3(f)\text{Ei}\left(\frac{c\log(f)}{a+bx}\right)}{6b^3}+\frac{ac^2\log^2(f)\text{Ei}\left(\frac{c\log(f)}{a+bx}\right)}{b^3}+\frac{c^2\log^2(f)(a+bx)f^{\frac{c}{a+bx}}}{6b^3}$$

```
[Out] a^2*f^(c/(b*x+a))*(b*x+a)/b^3-a*f^(c/(b*x+a))*(b*x+a)^2/b^3+1/3*f^(c/(b*x+a
))*(b*x+a)^3/b^3-a*c*f^(c/(b*x+a))*(b*x+a)*ln(f)/b^3+1/6*c*f^(c/(b*x+a))*(b
*x+a)^2*ln(f)/b^3-a^2*c*Ei(c*ln(f)/(b*x+a))*ln(f)/b^3+1/6*c^2*f^(c/(b*x+a))
*(b*x+a)*ln(f)^2/b^3+a*c^2*Ei(c*ln(f)/(b*x+a))*ln(f)^2/b^3-1/6*c^3*Ei(c*ln(
f)/(b*x+a))*ln(f)^3/b^3
```

Rubi [A] time = 0.22, antiderivative size = 229, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.267$, Rules used = {2226, 2206, 2210, 2214}

$$-\frac{a^2 c \log(f) \text{Ei}\left(\frac{c\log(f)}{a+bx}\right)}{b^3}+\frac{a^2(a+bx)f^{\frac{c}{a+bx}}}{b^3}-\frac{c^3\log^3(f)\text{Ei}\left(\frac{c\log(f)}{a+bx}\right)}{6b^3}+\frac{ac^2\log^2(f)\text{Ei}\left(\frac{c\log(f)}{a+bx}\right)}{b^3}+\frac{c^2\log^2(f)(a+bx)f^{\frac{c}{a+bx}}}{6b^3}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c/(a + b*x))*x^2,x]
```

```
[Out] (a^2*f^(c/(a + b*x))*(a + b*x))/b^3 - (a*f^(c/(a + b*x))*(a + b*x)^2)/b^3 +
 (f^(c/(a + b*x))*(a + b*x)^3)/(3*b^3) - (a*c*f^(c/(a + b*x))*(a + b*x)*Log
[f])/b^3 + (c*f^(c/(a + b*x))*(a + b*x)^2*Log[f])/(6*b^3) - (a^2*c*ExpInteg
ralEi[(c*Log[f])/(a + b*x)]*Log[f])/b^3 + (c^2*f^(c/(a + b*x))*(a + b*x)*Lo
g[f]^2)/(6*b^3) + (a*c^2*ExpIntegralEi[(c*Log[f])/(a + b*x)]*Log[f]^2)/b^3
- (c^3*ExpIntegralEi[(c*Log[f])/(a + b*x)]*Log[f]^3)/(6*b^3)
```

Rule 2206

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[((c +
 d*x)*F^(a + b*(c + d*x)^n))/d, x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rule 2226

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int f^{\frac{c}{a+bx}}x^2\,dx=\int\left(\frac{a^2f^{\frac{c}{a+bx}}}{b^2}-\frac{2af^{\frac{c}{a+bx}}(a+bx)}{b^2}+\frac{f^{\frac{c}{a+bx}}(a+bx)^2}{b^2}\right)dx$$

$$=\frac{\int f^{\frac{c}{a+bx}}(a+bx)^2\,dx}{b^2}-\frac{(2a)\int f^{\frac{c}{a+bx}}(a+bx)\,dx}{b^2}+\frac{a^2\int f^{\frac{c}{a+bx}}\,dx}{b^2}$$

$$=\frac{a^2f^{\frac{c}{a+bx}}(a+bx)}{b^3}-\frac{af^{\frac{c}{a+bx}}(a+bx)^2}{b^3}+\frac{f^{\frac{c}{a+bx}}(a+bx)^3}{3b^3}+\frac{(c\log(f))\int f^{\frac{c}{a+bx}}(a+bx)\,dx}{3b^2}-\frac{(ac\log(f$$

$$=\frac{a^2f^{\frac{c}{a+bx}}(a+bx)}{b^3}-\frac{af^{\frac{c}{a+bx}}(a+bx)^2}{b^3}+\frac{f^{\frac{c}{a+bx}}(a+bx)^3}{3b^3}-\frac{acf^{\frac{c}{a+bx}}(a+bx)\log(f)}{b^3}+\frac{cf^{\frac{c}{a+bx}}(a+bx)^2}{6b^3}$$

$$=\frac{a^2f^{\frac{c}{a+bx}}(a+bx)}{b^3}-\frac{af^{\frac{c}{a+bx}}(a+bx)^2}{b^3}+\frac{f^{\frac{c}{a+bx}}(a+bx)^3}{3b^3}-\frac{acf^{\frac{c}{a+bx}}(a+bx)\log(f)}{b^3}+\frac{cf^{\frac{c}{a+bx}}(a+bx)^2}{6b^3}$$

$$=\frac{a^2f^{\frac{c}{a+bx}}(a+bx)}{b^3}-\frac{af^{\frac{c}{a+bx}}(a+bx)^2}{b^3}+\frac{f^{\frac{c}{a+bx}}(a+bx)^3}{3b^3}-\frac{acf^{\frac{c}{a+bx}}(a+bx)\log(f)}{b^3}+\frac{cf^{\frac{c}{a+bx}}(a+bx)^2}{6b^3}$$

Mathematica [A] time = 0.13, size = 128, normalized size = 0.56

$$\frac{a\left(2a^2-5ac\log(f)+c^2\log^2(f)\right)f^{\frac{c}{a+bx}}}{6b^3}+\frac{bxf^{\frac{c}{a+bx}}\left(\log(f)(bcx-4ac)+2b^2x^2+c^2\log^2(f)\right)-c\log(f)\left(6a^2-6ac\right.}{6b^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c/(a + b*x))*x^2,x]
```

```
[Out] (a*f^(c/(a + b*x))*(2*a^2 - 5*a*c*Log[f] + c^2*Log[f]^2))/(6*b^3) + (-(c*Ex
pIntegralEi[(c*Log[f])/(a + b*x)]*Log[f]*(6*a^2 - 6*a*c*Log[f] + c^2*Log[f]
^2)) + b*f^(c/(a + b*x))*x*(2*b^2*x^2 + (-4*a*c + b*c*x)*Log[f] + c^2*Log[f
]^2))/(6*b^3)
```

fricas [A] time = 0.45, size = 114, normalized size = 0.50

$$\frac{\left(2\,b^{3}x^{3}+2\,a^{3}+\left(bc^{2}x+ac^{2}\right)\log(f)^{2}+\left(b^{2}cx^{2}-4\,abcx-5\,a^{2}c\right)\log(f)\right)f^{\frac{c}{bx+a}}-\left(c^{3}\log(f)^{3}-6\,ac^{2}\log(f)^{2}+6\,a^{2}\right.}{6\,b^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a))*x^2,x, algorithm="fricas")
```

```
[Out] 1/6*((2*b^3*x^3 + 2*a^3 + (b*c^2*x + a*c^2)*log(f)^2 + (b^2*c*x^2 - 4*a*b*c
*x - 5*a^2*c)*log(f))*f^(c/(b*x + a)) - (c^3*log(f)^3 - 6*a*c^2*log(f)^2 +
6*a^2*c*log(f))*Ei(c*log(f)/(b*x + a)))/b^3
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{bx+a}}x^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a))*x^2,x, algorithm="giac")
```

```
[Out] integrate(f^(c/(b*x + a))*x^2, x)
```

maple [A] time = 0.12, size = 227, normalized size = 0.99

$$\frac{c\,x^{2}f^{\frac{c}{bx+a}}\ln(f)}{6b}+\frac{c^{2}x\,f^{\frac{c}{bx+a}}\ln(f)^{2}}{6b^{2}}+\frac{c^{3}\,\mathrm{Ei}\left(1,-\frac{c\ln(f)}{bx+a}\right)\ln(f)^{3}}{6b^{3}}+\frac{x^{3}f^{\frac{c}{bx+a}}}{3}-\frac{2acx\,f^{\frac{c}{bx+a}}\ln(f)}{3b^{2}}+\frac{a\,c^{2}f^{\frac{c}{bx+a}}\ln(f)^{2}}{6b^{3}}-\frac{a\,c^{2}\,\mathrm{Ei}\left(\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(1/(b*x+a)*c)*x^2,x)
```

```
[Out] 1/3/b^3*a^3*f^(1/(b*x+a)*c)+c*ln(f)/b^3*a^2*Ei(1,-1/(b*x+a)*c*ln(f))+1/3*f^
(1/(b*x+a)*c)*x^3+1/6*c*ln(f)/b*f^(1/(b*x+a)*c)*x^2-2/3*c*ln(f)/b^2*f^(1/(b
*x+a)*c)*a*x-5/6*c*ln(f)/b^3*f^(1/(b*x+a)*c)*a^2+1/6*c^2*ln(f)^2/b^2*f^(1/(
b*x+a)*c)*x+1/6*c^2*ln(f)^2/b^3*f^(1/(b*x+a)*c)*a+1/6*c^3*ln(f)^3/b^3*Ei(1,
-1/(b*x+a)*c*ln(f))-c^2*ln(f)^2/b^3*a*Ei(1,-1/(b*x+a)*c*ln(f))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\left(2\,b^2x^3+bcx^2\log(f)+\left(c^2\log(f)^2-4\,ac\log(f)\right)x\right)f^{\frac{c}{bx+a}}}{6\,b^2}+\int-\frac{\left(a^2c^2\log(f)^2-4\,a^3c\log(f)-\left(bc^3\log(f)^3-6\,a\right.\right.}{6\left(b^4x^2+2\,ab^3x+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a))*x^2,x, algorithm="maxima")
```

```
[Out] 1/6*(2*b^2*x^3 + b*c*x^2*log(f) + (c^2*log(f)^2 - 4*a*c*log(f))*x)*f^(c/(b*
x + a))/b^2 + integrate(-1/6*(a^2*c^2*log(f)^2 - 4*a^3*c*log(f) - (b*c^3*lo
g(f)^3 - 6*a*b*c^2*log(f)^2 + 6*a^2*b*c*log(f))*x)*f^(c/(b*x + a))/(b^4*x^2
 + 2*a*b^3*x + a^2*b^2), x)
```

mupad [B] time = 3.93, size = 209, normalized size = 0.91

$$\frac{\frac{b\,f^{\frac{c}{a+b\,x}}\,x^4}{3}+f^{\frac{c}{a+b\,x}}\,x^3\,\left(\frac{a}{3}+\frac{c\,\ln(f)}{6}\right)+\frac{f^{\frac{c}{a+b\,x}}\,x\,\left(2\,a^3-9\,a^2\,c\,\ln(f)+2\,a\,c^2\,\ln(f)^2\right)}{6\,b^2}+\frac{f^{\frac{c}{a+b\,x}}\,x^2\,\left(c^2\,\ln(f)^2-3\,a\,c\,\ln(f)\right)}{6\,b}+\frac{a^2\,f^{\frac{c}{a+b\,x}}\,\left(2\,a^2-5\,a\right.}{6\,b}}{a+b\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x))*x^2,x)
```

```
[Out] ((b*f^(c/(a + b*x))*x^4)/3 + f^(c/(a + b*x))*x^3*(a/3 + (c*log(f))/6) + (f^
(c/(a + b*x))*x*(2*a^3 - 9*a^2*c*log(f) + 2*a*c^2*log(f)^2))/(6*b^2) + (f^(
c/(a + b*x))*x^2*(c^2*log(f)^2 - 3*a*c*log(f)))/(6*b) + (a^2*f^(c/(a + b*x)
)*(c^2*log(f)^2 + 2*a^2 - 5*a*c*log(f)))/(6*b^3))/(a + b*x) - (ei((c*log(f)
)/(a + b*x))*(c^3*log(f)^3 + 6*a^2*c*log(f) - 6*a*c^2*log(f)^2))/(6*b^3)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{a+bx}}x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a))*x**2,x)
```

```
[Out] Integral(f**(c/(a + b*x))*x**2, x)
```

3.219 $\int f^{\frac{c}{a+bx}} x \, dx$

Optimal. Leaf size=120

$$-\frac{c^2\log^2(f)\text{Ei}\left(\frac{c\log(f)}{a+bx}\right)}{2b^2}+\frac{ac\log(f)\text{Ei}\left(\frac{c\log(f)}{a+bx}\right)}{b^2}+\frac{(a+bx)^2f^{\frac{c}{a+bx}}}{2b^2}-\frac{a(a+bx)f^{\frac{c}{a+bx}}}{b^2}+\frac{c\log(f)(a+bx)f^{\frac{c}{a+bx}}}{2b^2}$$

```
[Out] -a*f^(c/(b*x+a))*(b*x+a)/b^2+1/2*f^(c/(b*x+a))*(b*x+a)^2/b^2+1/2*c*f^(c/(b*
x+a))*(b*x+a)*ln(f)/b^2+a*c*Ei(c*ln(f)/(b*x+a))*ln(f)/b^2-1/2*c^2*Ei(c*ln(f
)/(b*x+a))*ln(f)^2/b^2
```

Rubi [A] time = 0.12, antiderivative size = 120, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308, Rules used = {2226, 2206, 2210, 2214}

$$-\frac{c^2\log^2(f)\text{Ei}\left(\frac{c\log(f)}{a+bx}\right)}{2b^2}+\frac{ac\log(f)\text{Ei}\left(\frac{c\log(f)}{a+bx}\right)}{b^2}+\frac{(a+bx)^2f^{\frac{c}{a+bx}}}{2b^2}-\frac{a(a+bx)f^{\frac{c}{a+bx}}}{b^2}+\frac{c\log(f)(a+bx)f^{\frac{c}{a+bx}}}{2b^2}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c/(a + b*x))*x,x]
```

```
[Out] -((a*f^(c/(a + b*x))*(a + b*x))/b^2) + (f^(c/(a + b*x))*(a + b*x)^2)/(2*b^2
) + (c*f^(c/(a + b*x))*(a + b*x)*Log[f])/(2*b^2) + (a*c*ExpIntegralEi[(c*Lo
g[f])/(a + b*x)]*Log[f])/b^2 - (c^2*ExpIntegralEi[(c*Log[f])/(a + b*x)]*Log
[f]^2)/(2*b^2)
```

Rule 2206

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[((c +
 d*x)*F^(a + b*(c + d*x)^n))/d, x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
```

```
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rule 2226

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\begin{aligned}
\int f^{\frac{c}{a+bx}}x\,dx &= \int\left(-\frac{af^{\frac{c}{a+bx}}}{b}+\frac{f^{\frac{c}{a+bx}}(a+bx)}{b}\right)dx\\
&= \frac{\int f^{\frac{c}{a+bx}}(a+bx)\,dx}{b}-\frac{a\int f^{\frac{c}{a+bx}}\,dx}{b}\\
&= -\frac{af^{\frac{c}{a+bx}}(a+bx)}{b^2}+\frac{f^{\frac{c}{a+bx}}(a+bx)^2}{2b^2}+\frac{(c\log(f))\int f^{\frac{c}{a+bx}}\,dx}{2b}-\frac{(ac\log(f))\int\frac{f^{\frac{c}{a+bx}}}{a+bx}\,dx}{b}\\
&= -\frac{af^{\frac{c}{a+bx}}(a+bx)}{b^2}+\frac{f^{\frac{c}{a+bx}}(a+bx)^2}{2b^2}+\frac{cf^{\frac{c}{a+bx}}(a+bx)\log(f)}{2b^2}+\frac{ac\text{Ei}\left(\frac{c\log(f)}{a+bx}\right)\log(f)}{b^2}+\frac{\left(c^2\log^2(f)\right)}{2}\\
&= -\frac{af^{\frac{c}{a+bx}}(a+bx)}{b^2}+\frac{f^{\frac{c}{a+bx}}(a+bx)^2}{2b^2}+\frac{cf^{\frac{c}{a+bx}}(a+bx)\log(f)}{2b^2}+\frac{ac\text{Ei}\left(\frac{c\log(f)}{a+bx}\right)\log(f)}{b^2}-\frac{c^2\text{Ei}\left(\frac{c\log(f)}{a+bx}\right)}{2b}
\end{aligned}$$

Mathematica [A] time = 0.07, size = 82, normalized size = 0.68

$$\frac{c\log(f)(2a-c\log(f))\text{Ei}\left(\frac{c\log(f)}{a+bx}\right)+bxf^{\frac{c}{a+bx}}(bx+c\log(f))}{2b^2}-\frac{a(a-c\log(f))f^{\frac{c}{a+bx}}}{2b^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c/(a + b*x))*x,x]
```

```
[Out] -1/2*(a*f^(c/(a + b*x))*(a - c*Log[f]))/b^2 + (c*ExpIntegralEi[(c*Log[f])/(
a + b*x)]*Log[f]*(2*a - c*Log[f]) + b*f^(c/(a + b*x))*x*(b*x + c*Log[f]))/(
2*b^2)
```

fricas [A] time = 0.43, size = 71, normalized size = 0.59

$$\frac{\left(b^2x^2 - a^2 + (bcx + ac)\log(f)\right)f^{\frac{c}{bx+a}} - \left(c^2\log(f)^2 - 2\,ac\log(f)\right)\mathrm{Ei}\left(\frac{c\log(f)}{bx+a}\right)}{2\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a))*x,x, algorithm="fricas")
```

```
[Out] 1/2*((b^2*x^2 - a^2 + (b*c*x + a*c)*log(f))*f^(c/(b*x + a)) - (c^2*log(f)^2
 - 2*a*c*log(f))*Ei(c*log(f)/(b*x + a)))/b^2
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{bx+a}}x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a))*x,x, algorithm="giac")
```

```
[Out] integrate(f^(c/(b*x + a))*x, x)
```

maple [A] time = 0.11, size = 126, normalized size = 1.05

$$\frac{cx\,f^{\frac{c}{bx+a}}\ln(f)}{2b}+\frac{c^2\,\mathrm{Ei}\left(1,-\frac{c\ln(f)}{bx+a}\right)\ln(f)^2}{2b^2}+\frac{x^2f^{\frac{c}{bx+a}}}{2}+\frac{ac\,f^{\frac{c}{bx+a}}\ln(f)}{2b^2}-\frac{ac\,\mathrm{Ei}\left(1,-\frac{c\ln(f)}{bx+a}\right)\ln(f)}{b^2}-\frac{a^2f^{\frac{c}{bx+a}}}{2b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(1/(b*x+a)*c)*x,x)
```

```
[Out] 1/2*f^(1/(b*x+a)*c)*x^2-1/2/b^2*f^(1/(b*x+a)*c)*a^2+1/2*c*ln(f)/b*f^(1/(b*x
+a)*c)*x+1/2*c*ln(f)/b^2*f^(1/(b*x+a)*c)*a+1/2*c^2*ln(f)^2/b^2*Ei(1,-1/(b*x
+a)*c*ln(f))-c*ln(f)/b^2*a*Ei(1,-1/(b*x+a)*c*ln(f))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\left(bx^2 + cx\log(f)\right)f^{\frac{c}{bx+a}}}{2\,b} - \int \frac{\left(a^2c\log(f) - \left(bc^2\log(f)^2 - 2\,abc\log(f)\right)x\right)f^{\frac{c}{bx+a}}}{2\left(b^3x^2 + 2\,ab^2x + a^2b\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a))*x,x, algorithm="maxima")
```

```
[Out] 1/2*(b*x^2 + c*x*log(f))*f^(c/(b*x + a))/b - integrate(1/2*(a^2*c*log(f) -
(b*c^2*log(f)^2 - 2*a*b*c*log(f))*x)*f^(c/(b*x + a))/(b^3*x^2 + 2*a*b^2*x +
 a^2*b), x)
```

mupad [B] time = 3.65, size = 136, normalized size = 1.13

$$\frac{\frac{b\,f^{\frac{c}{a+b\,x}}\,x^3}{2}+f^{\frac{c}{a+b\,x}}\,x^2\,\left(\frac{a}{2}+\frac{c\,\ln(f)}{2}\right)-\frac{a^2\,f^{\frac{c}{a+b\,x}}\,\left(a-c\,\ln(f)\right)}{2\,b^2}-\frac{f^{\frac{c}{a+b\,x}}\,x\,\left(a^2-2\,a\,c\,\ln(f)\right)}{2\,b}}{a+b\,x}-\frac{\mathrm{ei}\left(\frac{c\,\ln(f)}{a+b\,x}\right)\,\left(c^2\,\ln(f)^2-2\,a\,c\,\ln(f)\right)}{2\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x))*x,x)
```

```
[Out] ((b*f^(c/(a + b*x))*x^3)/2 + f^(c/(a + b*x))*x^2*(a/2 + (c*log(f))/2) - (a^
2*f^(c/(a + b*x))*(a - c*log(f)))/(2*b^2) - (f^(c/(a + b*x))*x*(a^2 - 2*a*c
*log(f)))/(2*b))/(a + b*x) - (ei((c*log(f))/(a + b*x))*(c^2*log(f)^2 - 2*a*
c*log(f)))/(2*b^2)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{a+bx}}x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a))*x,x)
```

```
[Out] Integral(f**(c/(a + b*x))*x, x)
```

3.220 $\int f^{\frac{c}{a+bx}} dx$

Optimal. Leaf size=41

$$\frac{(a+bx)f^{\frac{c}{a+bx}}}{b}-\frac{c\log(f)\text{Ei}\left(\frac{c\log(f)}{a+bx}\right)}{b}$$

```
[Out] f^(c/(b*x+a))*(b*x+a)/b-c*Ei(c*ln(f)/(b*x+a))*ln(f)/b
```

Rubi [A] time = 0.03, antiderivative size = 41, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182, Rules used = {2206, 2210}

$$\frac{(a+bx)f^{\frac{c}{a+bx}}}{b}-\frac{c\log(f)\text{Ei}\left(\frac{c\log(f)}{a+bx}\right)}{b}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c/(a + b*x)),x]
```

```
[Out] (f^(c/(a + b*x))*(a + b*x))/b - (c*ExpIntegralEi[(c*Log[f])/(a + b*x)]*Log[
f])/b
```

Rule 2206

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[((c +
 d*x)*F^(a + b*(c + d*x)^n))/d, x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\begin{aligned}\int f^{\frac{c}{a+bx}} dx &= \frac{f^{\frac{c}{a+bx}}(a+bx)}{b}+(c\log(f))\int \frac{f^{\frac{c}{a+bx}}}{a+bx} dx\\ &= \frac{f^{\frac{c}{a+bx}}(a+bx)}{b}-\frac{c\text{Ei}\left(\frac{c\log(f)}{a+bx}\right)\log(f)}{b}\end{aligned}$$

Mathematica [A] time = 0.02, size = 41, normalized size = 1.00

$$\frac{(a+bx)f^{\frac{c}{a+bx}}}{b}-\frac{c\log(f)\text{Ei}\left(\frac{c\log(f)}{a+bx}\right)}{b}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c/(a + b*x)),x]
```

```
[Out] (f^(c/(a + b*x))*(a + b*x))/b - (c*ExpIntegralEi[(c*Log[f])/(a + b*x)]*Log[
f])/b
```

fricas [A] time = 0.43, size = 40, normalized size = 0.98

$$-\frac{c\text{Ei}\left(\frac{c\log(f)}{bx+a}\right)\log(f)-(bx+a)f^{\frac{c}{bx+a}}}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)),x, algorithm="fricas")
```

```
[Out] -(c*Ei(c*log(f)/(b*x + a))*log(f) - (b*x + a)*f^(c/(b*x + a)))/b
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{bx+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)),x, algorithm="giac")
```

```
[Out] integrate(f^(c/(b*x + a)), x)
```

maple [A] time = 0.10, size = 52, normalized size = 1.27

$$\frac{c\,\text{Ei}\left(1,-\frac{c\ln(f)}{bx+a}\right)\ln(f)}{b}+x\,f^{\frac{c}{bx+a}}+\frac{a\,f^{\frac{c}{bx+a}}}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(1/(b*x+a)*c),x)
```

```
[Out] f^(1/(b*x+a)*c)*x+1/b*f^(1/(b*x+a)*c)*a+c/b*ln(f)*Ei(1,-1/(b*x+a)*c*ln(f))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$bc \int \frac{f^{\frac{c}{bx+a}}x}{b^2x^2 + 2\,abx + a^2}\,dx \log(f) + f^{\frac{c}{bx+a}}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)),x, algorithm="maxima")
```

```
[Out] b*c*integrate(f^(c/(b*x + a))*x/(b^2*x^2 + 2*a*b*x + a^2), x)*log(f) + f^(c
/(b*x + a))*x
```

mupad [B] time = 3.55, size = 50, normalized size = 1.22

$$f^{\frac{c}{a+b\,x}}\,x + \frac{a\,f^{\frac{c}{a+b\,x}}}{b} - \frac{c\,\mathrm{ei}\left(\frac{c\,\ln(f)}{a+b\,x}\right)\,\ln(f)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x)),x)
```

```
[Out] f^(c/(a + b*x))*x + (a*f^(c/(a + b*x)))/b - (c*ei((c*log(f))/(a + b*x))*log
(f))/b
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{a+bx}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a)),x)
```

```
[Out] Integral(f**(c/(a + b*x)), x)
```

3.221 $\int \frac{f^{\frac{c}{a+bx}}}{x} dx$

Optimal. Leaf size=41

$$f^{\frac{c}{a}} \operatorname{Ei}\left(-\frac{bcx \log(f)}{a(a+bx)}\right) - \operatorname{Ei}\left(\frac{c \log(f)}{a+bx}\right)$$

```
[Out] -Ei(c*ln(f)/(b*x+a))+f^(c/a)*Ei(-b*c*x*ln(f)/a/(b*x+a))
```

Rubi [A] time = 0.13, antiderivative size = 41, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267, Rules used = {2222, 2210, 2228, 2178}

$$f^{\frac{c}{a}} \operatorname{Ei}\left(-\frac{bcx \log(f)}{a(a+bx)}\right) - \operatorname{Ei}\left(\frac{c \log(f)}{a+bx}\right)$$

Antiderivative was successfully verified.

```
[In] Int[f^(c/(a + b*x))/x,x]
```

```
[Out] -ExpIntegralEi[(c*Log[f])/(a + b*x)] + f^(c/a)*ExpIntegralEi[-((b*c*x*Log[f
])/(a*(a + b*x)))]
```

Rule 2178

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - (c*f)/d))*ExpIntegralEi[(f*g*(c + d*x)*Log[F])/d])/d, x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2222

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))/((e_.) + (f_.)*(x_)), x_Symbo
l] :> Dist[d/f, Int[F^(a + b/(c + d*x))/(c + d*x), x], x] - Dist[(d*e - c*f
)/f, Int[F^(a + b/(c + d*x))/((c + d*x)*(e + f*x)), x], x] /; FreeQ[{F, a,
b, c, d, e, f}, x] && NeQ[d*e - c*f, 0]
```

Rule 2228

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))/(((e_.) + (f_.)*(x_))*((g_.)
+ (h_.)*(x_))), x_Symbol] :> -Dist[d/(f*(d*g - c*h)), Subst[Int[F^(a - (b*h
```

```
)/(d*g - c*h) + (d*b*x)/(d*g - c*h))/x, x], x, (g + h*x)/(c + d*x)], x] /;
FreeQ[{F, a, b, c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\begin{aligned}\int \frac{f^{\frac{c}{a+bx}}}{x}\,dx &= a\int \frac{f^{\frac{c}{a+bx}}}{x(a+bx)}\,dx + b\int \frac{f^{\frac{c}{a+bx}}}{a+bx}\,dx\\ &= -\text{Ei}\left(\frac{c\log(f)}{a+bx}\right) + \text{Subst}\left(\int \frac{f^{\frac{c}{a}-\frac{bcx}{a}}}{x}\,dx, x, \frac{x}{a+bx}\right)\\ &= -\text{Ei}\left(\frac{c\log(f)}{a+bx}\right) + f^{\frac{c}{a}}\text{Ei}\left(-\frac{bcx\log(f)}{a(a+bx)}\right)\end{aligned}$$

Mathematica [A] time = 0.03, size = 41, normalized size = 1.00

$$f^{\frac{c}{a}}\text{Ei}\left(-\frac{bcx\log(f)}{a^2+bxa}\right) - \text{Ei}\left(\frac{c\log(f)}{a+bx}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c/(a + b*x))/x,x]
[Out] -ExpIntegralEi[(c*Log[f])/(a + b*x)] + f^(c/a)*ExpIntegralEi[-((b*c*x*Log[f
])/(a^2 + a*b*x))]
```

fricas [A] time = 0.43, size = 41, normalized size = 1.00

$$f^{\frac{c}{a}}\text{Ei}\left(-\frac{bcx\log(f)}{abx+a^2}\right) - \text{Ei}\left(\frac{c\log(f)}{bx+a}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a))/x,x, algorithm="fricas")
[Out] f^(c/a)*Ei(-b*c*x*log(f)/(a*b*x + a^2)) - Ei(c*log(f)/(b*x + a))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{bx+a}}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a))/x,x, algorithm="giac")
```

```
[Out] integrate(f^(c/(b*x + a))/x, x)
```

maple [A] time = 0.14, size = 47, normalized size = 1.15

$$-f^{\frac{c}{a}} \operatorname{Ei}\left(1,-\frac{c \ln(f)}{bx+a}+\frac{c \ln(f)}{a}\right)+\operatorname{Ei}\left(1,-\frac{c \ln(f)}{bx+a}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(1/(b*x+a)*c)/x,x)
```

```
[Out] -f^(1/a*c)*Ei(1,-1/(b*x+a)*c*ln(f)+c*ln(f)/a)+Ei(1,-1/(b*x+a)*c*ln(f))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{bx+a}}}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a))/x,x, algorithm="maxima")
```

```
[Out] integrate(f^(c/(b*x + a))/x, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{f^{\frac{c}{a+b\,x}}}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x))/x,x)
```

```
[Out] int(f^(c/(a + b*x))/x, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{a+bx}}}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a))/x,x)
```

```
[Out] Integral(f**(c/(a + b*x))/x, x)
```

3.222 $\int \frac{f^{\frac{c}{a+bx}}}{x^2} dx$

Optimal. Leaf size=68

$$-\frac{bc\log(f)f^{\frac{c}{a}}\text{Ei}\left(-\frac{bcx\log(f)}{a(a+bx)}\right)}{a^2}-\frac{bf^{\frac{c}{a+bx}}}{a}-\frac{f^{\frac{c}{a+bx}}}{x}$$

```
[Out] -b*f^(c/(b*x+a))/a-f^(c/(b*x+a))/x-b*c*f^(c/a)*Ei(-b*c*x*ln(f)/a/(b*x+a))*l
n(f)/a^2
```

Rubi [A] time = 0.40, antiderivative size = 68, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.467, Rules used = {2223, 6742, 2222, 2210, 2228, 2178, 2209}

$$-\frac{bc\log(f)f^{\frac{c}{a}}\text{Ei}\left(-\frac{bcx\log(f)}{a(a+bx)}\right)}{a^2}-\frac{bf^{\frac{c}{a+bx}}}{a}-\frac{f^{\frac{c}{a+bx}}}{x}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c/(a + b*x))/x^2,x]
```

```
[Out] -((b*f^(c/(a + b*x)))/a) - f^(c/(a + b*x))/x - (b*c*f^(c/a)*ExpIntegralEi[-
((b*c*x*Log[f])/(a*(a + b*x)))]*Log[f])/a^2
```

Rule 2178

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - (c*f)/d))*ExpIntegralEi[(f*g*(c + d*x)*Log[F])/d])/d, x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2222

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))/((e_.) + (f_.)*(x_)), x_Symbo
l] :> Dist[d/f, Int[F^(a + b/(c + d*x))/(c + d*x), x], x] - Dist[(d*e - c*f
)/f, Int[F^(a + b/(c + d*x))/((c + d*x)*(e + f*x)), x], x] /; FreeQ[{F, a,
b, c, d, e, f}, x] && NeQ[d*e - c*f, 0]
```

Rule 2223

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))*((e_.) + (f_.)*(x_))^(m_), x_
Symbol] :> Simp[((e + f*x)^(m + 1)*F^(a + b/(c + d*x)))/(f*(m + 1)), x] + D
ist[(b*d*Log[F])/(f*(m + 1)), Int[((e + f*x)^(m + 1)*F^(a + b/(c + d*x)))/(
c + d*x)^2, x], x] /; FreeQ[{F, a, b, c, d, e, f}, x] && NeQ[d*e - c*f, 0]
&& ILtQ[m, -1]
```

Rule 2228

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))/(((e_.) + (f_.)*(x_))*((g_.)
+ (h_.)*(x_))), x_Symbol] :> -Dist[d/(f*(d*g - c*h)), Subst[Int[F^(a - (b*h
)/(d*g - c*h) + (d*b*x)/(d*g - c*h))/x, x], x, (g + h*x)/(c + d*x)], x] /;
FreeQ[{F, a, b, c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$
\begin{aligned}
\int \frac{f^{\frac{c}{a+bx}}}{x^2}\,dx &= -\frac{f^{\frac{c}{a+bx}}}{x} - (bc\log(f))\int \frac{f^{\frac{c}{a+bx}}}{x(a+bx)^2}\,dx \\
&= -\frac{f^{\frac{c}{a+bx}}}{x} - (bc\log(f))\int \left(\frac{f^{\frac{c}{a+bx}}}{a^2x} - \frac{bf^{\frac{c}{a+bx}}}{a(a+bx)^2} - \frac{bf^{\frac{c}{a+bx}}}{a^2(a+bx)}\right)dx \\
&= -\frac{f^{\frac{c}{a+bx}}}{x} - \frac{(bc\log(f))\int \frac{f^{\frac{c}{a+bx}}}{x}\,dx}{a^2} + \frac{\left(b^2c\log(f)\right)\int \frac{f^{\frac{c}{a+bx}}}{a+bx}\,dx}{a^2} + \frac{\left(b^2c\log(f)\right)\int \frac{f^{\frac{c}{a+bx}}}{(a+bx)^2}\,dx}{a} \\
&= -\frac{bf^{\frac{c}{a+bx}}}{a} - \frac{f^{\frac{c}{a+bx}}}{x} - \frac{bc\text{Ei}\left(\frac{c\log(f)}{a+bx}\right)\log(f)}{a^2} - \frac{(bc\log(f))\int \frac{f^{\frac{c}{a+bx}}}{x(a+bx)}\,dx}{a} - \frac{\left(b^2c\log(f)\right)\int \frac{f^{\frac{c}{a+bx}}}{a+bx}\,dx}{a^2} \\
&= -\frac{bf^{\frac{c}{a+bx}}}{a} - \frac{f^{\frac{c}{a+bx}}}{x} - \frac{(bc\log(f))\,\text{Subst}\left(\int \frac{f^{\frac{c}{a}-\frac{bcx}{a}}}{x}\,dx, x, \frac{x}{a+bx}\right)}{a^2} \\
&= -\frac{bf^{\frac{c}{a+bx}}}{a} - \frac{f^{\frac{c}{a+bx}}}{x} - \frac{bcf^{\frac{c}{a}}\text{Ei}\left(-\frac{bcx\log(f)}{a(a+bx)}\right)\log(f)}{a^2}
\end{aligned}
$$

Mathematica [A] time = 0.11, size = 68, normalized size = 1.00

$$
-\frac{bc\log(f)f^{\frac{c}{a}}\text{Ei}\left(-\frac{bcx\log(f)}{a^2+bxa}\right)}{a^2} - \frac{bf^{\frac{c}{a+bx}}}{a} - \frac{f^{\frac{c}{a+bx}}}{x}
$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c/(a + b*x))/x^2,x]
```

```
[Out] -((b*f^(c/(a + b*x)))/a) - f^(c/(a + b*x))/x - (b*c*f^(c/a)*ExpIntegralEi[-
((b*c*x*Log[f])/(a^2 + a*b*x))]*Log[f])/a^2
```

fricas [A] time = 0.45, size = 60, normalized size = 0.88

$$
-\frac{bcf^{\frac{c}{a}}x\text{Ei}\left(-\frac{bcx\log(f)}{abx+a^2}\right)\log(f) + \left(abx+a^2\right)f^{\frac{c}{bx+a}}}{a^2x}
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a))/x^2,x, algorithm="fricas")
```

```
[Out] -(b*c*f^(c/a)*x*Ei(-b*c*x*log(f)/(a*b*x + a^2))*log(f) + (a*b*x + a^2)*f^(c
/(b*x + a)))/(a^2*x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{bx+a}}}{x^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a))/x^2,x, algorithm="giac")
```

```
[Out] integrate(f^(c/(b*x + a))/x^2, x)
```

maple [A] time = 0.12, size = 80, normalized size = 1.18

$$\frac{bc\, f^{\frac{c}{a}}\, \mathrm{Ei}\left(1, -\frac{c\ln(f)}{bx+a} + \frac{c\ln(f)}{a}\right)\ln(f)}{a^2} + \frac{bc\, f^{\frac{c}{bx+a}}\ln(f)}{\left(\frac{c\ln(f)}{bx+a} - \frac{c\ln(f)}{a}\right)a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(1/(b*x+a)*c)/x^2,x)
```

```
[Out] 1/a^2*ln(f)*b*c*f^(1/(b*x+a)*c)/(1/(b*x+a)*c*ln(f)-1/a*c*ln(f))+1/a^2*ln(f)
*b*c*f^(1/a*c)*Ei(1,-1/(b*x+a)*c*ln(f)+1/a*c*ln(f))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{bx+a}}}{x^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a))/x^2,x, algorithm="maxima")
```

```
[Out] integrate(f^(c/(b*x + a))/x^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{f^{\frac{c}{a+b\,x}}}{x^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x))/x^2,x)
```

```
[Out] int(f^(c/(a + b*x))/x^2, x)
```

<u>**sympy**</u> **[F]** time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{a+bx}}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a))/x**2,x)
```

```
[Out] Integral(f**(c/(a + b*x))/x**2, x)
```

3.223 $\int \frac{f^{\frac{c}{a+bx}}}{x^3} dx$

Optimal. Leaf size=166

$$\frac{b^2c^2\log^2(f)f^{\frac{c}{a}}\text{Ei}\left(-\frac{bcx\log(f)}{a(a+bx)}\right)}{2a^4}+\frac{b^2c\log(f)f^{\frac{c}{a}}\text{Ei}\left(-\frac{bcx\log(f)}{a(a+bx)}\right)}{a^3}+\frac{b^2c\log(f)f^{\frac{c}{a+bx}}}{2a^3}+\frac{b^2f^{\frac{c}{a+bx}}}{2a^2}+\frac{bc\log(f)f^{\frac{c}{a+bx}}}{2a^2x}-\frac{f^{\frac{c}{a+bx}}}{2x^2}$$

```
[Out] 1/2*b^2*f^(c/(b*x+a))/a^2-1/2*f^(c/(b*x+a))/x^2+1/2*b^2*c*f^(c/(b*x+a))*ln(
f)/a^3+1/2*b*c*f^(c/(b*x+a))*ln(f)/a^2/x+b^2*c*f^(c/a)*Ei(-b*c*x*ln(f)/a/(b
*x+a))*ln(f)/a^3+1/2*b^2*c^2*f^(c/a)*Ei(-b*c*x*ln(f)/a/(b*x+a))*ln(f)^2/a^4
```

Rubi [A] time = 0.72, antiderivative size = 166, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 7, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.467, Rules used = {2223, 6742, 2222, 2210, 2228, 2178, 2209}

$$\frac{b^2c^2\log^2(f)f^{\frac{c}{a}}\text{Ei}\left(-\frac{bcx\log(f)}{a(a+bx)}\right)}{2a^4}+\frac{b^2c\log(f)f^{\frac{c}{a}}\text{Ei}\left(-\frac{bcx\log(f)}{a(a+bx)}\right)}{a^3}+\frac{b^2f^{\frac{c}{a+bx}}}{2a^2}+\frac{b^2c\log(f)f^{\frac{c}{a+bx}}}{2a^3}+\frac{bc\log(f)f^{\frac{c}{a+bx}}}{2a^2x}-\frac{f^{\frac{c}{a+bx}}}{2x^2}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c/(a + b*x))/x^3,x]
```

```
[Out] (b^2*f^(c/(a + b*x)))/(2*a^2) - f^(c/(a + b*x))/(2*x^2) + (b^2*c*f^(c/(a +
b*x))*Log[f])/(2*a^3) + (b*c*f^(c/(a + b*x))*Log[f])/(2*a^2*x) + (b^2*c*f^(
c/a)*ExpIntegralEi[-((b*c*x*Log[f])/(a*(a + b*x)))]*Log[f])/a^3 + (b^2*c^2*
f^(c/a)*ExpIntegralEi[-((b*c*x*Log[f])/(a*(a + b*x)))]*Log[f]^2)/(2*a^4)
```

Rule 2178

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - (c*f)/d))*ExpIntegralEi[(f*g*(c + d*x)*Log[F])/d])/d, x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
```

```
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2222

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))/((e_.) + (f_.)*(x_)), x_Symbo
l] :> Dist[d/f, Int[F^(a + b/(c + d*x))/(c + d*x), x], x] - Dist[(d*e - c*f
)/f, Int[F^(a + b/(c + d*x))/((c + d*x)*(e + f*x)), x], x] /; FreeQ[{F, a,
b, c, d, e, f}, x] && NeQ[d*e - c*f, 0]
```

Rule 2223

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))*((e_.) + (f_.)*(x_))^(m_), x_
Symbol] :> Simp[((e + f*x)^(m + 1)*F^(a + b/(c + d*x)))/(f*(m + 1)), x] + D
ist[(b*d*Log[F])/(f*(m + 1)), Int[((e + f*x)^(m + 1)*F^(a + b/(c + d*x)))/(
c + d*x)^2, x], x] /; FreeQ[{F, a, b, c, d, e, f}, x] && NeQ[d*e - c*f, 0]
&& ILtQ[m, -1]
```

Rule 2228

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))/(((e_.) + (f_.)*(x_))*((g_.)
+ (h_.)*(x_))), x_Symbol] :> -Dist[d/(f*(d*g - c*h)), Subst[Int[F^(a - (b*h
)/(d*g - c*h) + (d*b*x)/(d*g - c*h))/x, x], x, (g + h*x)/(c + d*x)], x] /;
FreeQ[{F, a, b, c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int \frac{f^{\frac{c}{a+bx}}}{x^3}\,dx = -\frac{f^{\frac{c}{a+bx}}}{2x^2} - \frac{1}{2}(bc\log(f))\int \frac{f^{\frac{c}{a+bx}}}{x^2(a+bx)^2}\,dx$$

$$= -\frac{f^{\frac{c}{a+bx}}}{2x^2} - \frac{1}{2}(bc\log(f))\int \left(\frac{f^{\frac{c}{a+bx}}}{a^2x^2} - \frac{2bf^{\frac{c}{a+bx}}}{a^3x} + \frac{b^2f^{\frac{c}{a+bx}}}{a^2(a+bx)^2} + \frac{2b^2f^{\frac{c}{a+bx}}}{a^3(a+bx)}\right)dx$$

$$= -\frac{f^{\frac{c}{a+bx}}}{2x^2} - \frac{(bc\log(f))\int \frac{f^{\frac{c}{a+bx}}}{x^2}\,dx}{2a^2} + \frac{\left(b^2c\log(f)\right)\int \frac{f^{\frac{c}{a+bx}}}{x}\,dx}{a^3} - \frac{\left(b^3c\log(f)\right)\int \frac{f^{\frac{c}{a+bx}}}{a+bx}\,dx}{a^3} - \frac{\left(b^3c\log(f\right.}{}$$

$$= \frac{b^2f^{\frac{c}{a+bx}}}{2a^2} - \frac{f^{\frac{c}{a+bx}}}{2x^2} + \frac{bcf^{\frac{c}{a+bx}}\log(f)}{2a^2x} + \frac{b^2c\text{Ei}\left(\frac{c\log(f)}{a+bx}\right)\log(f)}{a^3} + \frac{\left(b^2c\log(f)\right)\int \frac{f^{\frac{c}{a+bx}}}{x(a+bx)}\,dx}{a^2} + \frac{\left(b^3c\log\right.}{}$$

$$= \frac{b^2f^{\frac{c}{a+bx}}}{2a^2} - \frac{f^{\frac{c}{a+bx}}}{2x^2} + \frac{bcf^{\frac{c}{a+bx}}\log(f)}{2a^2x} + \frac{\left(b^2c\log(f)\right)\text{Subst}\left(\int \frac{f^{\frac{c}{a}-\frac{bcx}{a}}}{x}\,dx, x, \frac{x}{a+bx}\right)}{a^3} + \frac{\left(b^2c^2\log^2(f)\right)\int}{}$$

$$= \frac{b^2f^{\frac{c}{a+bx}}}{2a^2} - \frac{f^{\frac{c}{a+bx}}}{2x^2} + \frac{bcf^{\frac{c}{a+bx}}\log(f)}{2a^2x} + \frac{b^2cf^{\frac{c}{a}}\text{Ei}\left(-\frac{bcx\log(f)}{a(a+bx)}\right)\log(f)}{a^3} + \frac{\left(b^2c^2\log^2(f)\right)\int \frac{f^{\frac{c}{a+bx}}}{x}\,dx}{2a^4} - \frac{(\ldots}{}$$

$$= \frac{b^2f^{\frac{c}{a+bx}}}{2a^2} - \frac{f^{\frac{c}{a+bx}}}{2x^2} + \frac{b^2cf^{\frac{c}{a+bx}}\log(f)}{2a^3} + \frac{bcf^{\frac{c}{a+bx}}\log(f)}{2a^2x} + \frac{b^2cf^{\frac{c}{a}}\text{Ei}\left(-\frac{bcx\log(f)}{a(a+bx)}\right)\log(f)}{a^3} + \frac{b^2c^2\text{Ei}\left(\frac{c\log}{a+}\right.}{2}$$

$$= \frac{b^2f^{\frac{c}{a+bx}}}{2a^2} - \frac{f^{\frac{c}{a+bx}}}{2x^2} + \frac{b^2cf^{\frac{c}{a+bx}}\log(f)}{2a^3} + \frac{bcf^{\frac{c}{a+bx}}\log(f)}{2a^2x} + \frac{b^2cf^{\frac{c}{a}}\text{Ei}\left(-\frac{bcx\log(f)}{a(a+bx)}\right)\log(f)}{a^3} + \frac{\left(b^2c^2\log^2(\right.}{}$$

$$= \frac{b^2f^{\frac{c}{a+bx}}}{2a^2} - \frac{f^{\frac{c}{a+bx}}}{2x^2} + \frac{b^2cf^{\frac{c}{a+bx}}\log(f)}{2a^3} + \frac{bcf^{\frac{c}{a+bx}}\log(f)}{2a^2x} + \frac{b^2cf^{\frac{c}{a}}\text{Ei}\left(-\frac{bcx\log(f)}{a(a+bx)}\right)\log(f)}{a^3} + \frac{b^2c^2f^{\frac{c}{a}}\text{Ei}\left(\right.}{}$$

Mathematica [A] time = 0.19, size = 115, normalized size = 0.69

$$\frac{b^2(2a+c\log(f))f^{\frac{c}{a+bx}}}{2a^3} + \frac{b^2c\log(f)f^{\frac{c}{a}}(2a+c\log(f))\text{Ei}\left(-\frac{bcx\log(f)}{a^2+bxa}\right) - \frac{a^2f^{\frac{c}{a+bx}}\left(a^2+b^2x^2-bcx\log(f)\right)}{x^2}}{2a^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c/(a + b*x))/x^3,x]
```

```
[Out] (b^2*f^(c/(a + b*x))*(2*a + c*Log[f]))/(2*a^3) + (b^2*c*f^(c/a)*ExpIntegral
Ei[-((b*c*x*Log[f])/(a^2 + a*b*x))]*Log[f]*(2*a + c*Log[f]) - (a^2*f^(c/(a
+ b*x))*(a^2 + b^2*x^2 - b*c*x*Log[f]))/x^2)/(2*a^4)
```

fricas [A] time = 0.44, size = 110, normalized size = 0.66

$$\frac{\left(b^2c^2x^2\log(f)^2 + 2\,ab^2cx^2\log(f)\right)f^{\frac{c}{a}}\mathrm{Ei}\left(-\frac{bcx\log(f)}{abx+a^2}\right) + \left(a^2b^2x^2 - a^4 + \left(ab^2cx^2 + a^2bcx\right)\log(f)\right)f^{\frac{c}{bx+a}}}{2\,a^4x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a))/x^3,x, algorithm="fricas")
```

```
[Out] 1/2*((b^2*c^2*x^2*log(f)^2 + 2*a*b^2*c*x^2*log(f))*f^(c/a)*Ei(-b*c*x*log(f)
/(a*b*x + a^2)) + (a^2*b^2*x^2 - a^4 + (a*b^2*c*x^2 + a^2*b*c*x)*log(f))*f^
(c/(b*x + a)))/(a^4*x^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{bx+a}}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a))/x^3,x, algorithm="giac")
```

```
[Out] integrate(f^(c/(b*x + a))/x^3, x)
```

maple [A] time = 0.13, size = 226, normalized size = 1.36

$$-\frac{b^2c^2f^{\frac{c}{a}}\,\mathrm{Ei}\left(1,-\frac{c\ln(f)}{bx+a}+\frac{c\ln(f)}{a}\right)\ln(f)^2}{2a^4}-\frac{b^2c\,f^{\frac{c}{a}}\,\mathrm{Ei}\left(1,-\frac{c\ln(f)}{bx+a}+\frac{c\ln(f)}{a}\right)\ln(f)}{a^3}-\frac{b^2c^2f^{\frac{c}{bx+a}}\ln(f)^2}{2\left(\frac{c\ln(f)}{bx+a}-\frac{c\ln(f)}{a}\right)^2a^4}-\frac{b^2c^2f^{\frac{c}{bx+a}}\ln}{2\left(\frac{c\ln(f)}{bx+a}-\frac{c\ln}{a}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(1/(b*x+a)*c)/x^3,x)
```

```
[Out] -ln(f)*b^2*c/a^3*f^(1/(b*x+a)*c)/(1/(b*x+a)*c*ln(f)-1/a*c*ln(f))-ln(f)*b^2*
c/a^3*f^(1/a*c)*Ei(1,-1/(b*x+a)*c*ln(f)+1/a*c*ln(f))-1/2*ln(f)^2*b^2*c^2/a^
4*f^(1/(b*x+a)*c)/(1/(b*x+a)*c*ln(f)-1/a*c*ln(f))^2-1/2*ln(f)^2*b^2*c^2/a^4
*f^(1/(b*x+a)*c)/(1/(b*x+a)*c*ln(f)-1/a*c*ln(f))-1/2*ln(f)^2*b^2*c^2/a^4*f^
(1/a*c)*Ei(1,-1/(b*x+a)*c*ln(f)+1/a*c*ln(f))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{bx+a}}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a))/x^3,x, algorithm="maxima")
[Out] integrate(f^(c/(b*x + a))/x^3, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{f^{\frac{c}{a+b\,x}}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x))/x^3,x)
[Out] int(f^(c/(a + b*x))/x^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{a+bx}}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a))/x**3,x)
[Out] Integral(f**(c/(a + b*x))/x**3, x)
```

3.224 $\int f^{\frac{c}{(a+bx)^2}} x^4 \, dx$

Optimal. Leaf size=415

$$-\frac{\sqrt{\pi}\, a^4 \sqrt{c}\, \sqrt{\log(f)}\, \mathrm{erfi}\left(\frac{\sqrt{c}\,\sqrt{\log(f)}}{a+bx}\right)}{b^5}+\frac{a^4(a+bx)f^{\frac{c}{(a+bx)^2}}}{b^5}+\frac{2a^3c\log(f)\mathrm{Ei}\left(\frac{c\log(f)}{(a+bx)^2}\right)}{b^5}-\frac{2a^3(a+bx)^2f^{\frac{c}{(a+bx)^2}}}{b^5}-\frac{4\sqrt{\pi}\, a^2c^3}{}$$

```
[Out] a^4*f^(c/(b*x+a)^2)*(b*x+a)/b^5-2*a^3*f^(c/(b*x+a)^2)*(b*x+a)^2/b^5+2*a^2*f
^(c/(b*x+a)^2)*(b*x+a)^3/b^5-a*f^(c/(b*x+a)^2)*(b*x+a)^4/b^5+1/5*f^(c/(b*x+
a)^2)*(b*x+a)^5/b^5+4*a^2*c*f^(c/(b*x+a)^2)*(b*x+a)*ln(f)/b^5-a*c*f^(c/(b*x
+a)^2)*(b*x+a)^2*ln(f)/b^5+2/15*c*f^(c/(b*x+a)^2)*(b*x+a)^3*ln(f)/b^5+2*a^3
*c*Ei(c*ln(f)/(b*x+a)^2)*ln(f)/b^5+4/15*c^2*f^(c/(b*x+a)^2)*(b*x+a)*ln(f)^2
/b^5+a*c^2*Ei(c*ln(f)/(b*x+a)^2)*ln(f)^2/b^5-4*a^2*c^(3/2)*erfi(c^(1/2)*ln(
f)^(1/2)/(b*x+a))*ln(f)^(3/2)*Pi^(1/2)/b^5-4/15*c^(5/2)*erfi(c^(1/2)*ln(f)^
(1/2)/(b*x+a))*ln(f)^(5/2)*Pi^(1/2)/b^5-a^4*erfi(c^(1/2)*ln(f)^(1/2)/(b*x+a
))*c^(1/2)*Pi^(1/2)*ln(f)^(1/2)/b^5
```

Rubi [A] time = 0.44, antiderivative size = 415, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.400$, Rules used = {2226, 2206, 2211, 2204, 2214, 2210}

$$-\frac{4\sqrt{\pi}\, a^2c^{3/2}\log^{\frac{3}{2}}(f)\mathrm{Erfi}\left(\frac{\sqrt{c}\,\sqrt{\log(f)}}{a+bx}\right)}{b^5}-\frac{\sqrt{\pi}\, a^4\sqrt{c}\,\sqrt{\log(f)}\,\mathrm{Erfi}\left(\frac{\sqrt{c}\,\sqrt{\log(f)}}{a+bx}\right)}{b^5}+\frac{2a^3c\log(f)\mathrm{Ei}\left(\frac{c\log(f)}{(a+bx)^2}\right)}{b^5}+\frac{2a^2(a+bx)^3}{b^5}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c/(a + b*x)^2)*x^4,x]
```

```
[Out] (a^4*f^(c/(a + b*x)^2)*(a + b*x))/b^5 - (2*a^3*f^(c/(a + b*x)^2)*(a + b*x)^
2)/b^5 + (2*a^2*f^(c/(a + b*x)^2)*(a + b*x)^3)/b^5 - (a*f^(c/(a + b*x)^2)*(
a + b*x)^4)/b^5 + (f^(c/(a + b*x)^2)*(a + b*x)^5)/(5*b^5) - (a^4*Sqrt[c]*Sq
rt[Pi]*Erfi[(Sqrt[c]*Sqrt[Log[f]])/(a + b*x)]*Sqrt[Log[f]])/b^5 + (4*a^2*c*
f^(c/(a + b*x)^2)*(a + b*x)*Log[f])/b^5 - (a*c*f^(c/(a + b*x)^2)*(a + b*x)^
2*Log[f])/b^5 + (2*c*f^(c/(a + b*x)^2)*(a + b*x)^3*Log[f])/(15*b^5) + (2*a^
3*c*ExpIntegralEi[(c*Log[f])/(a + b*x)^2]*Log[f])/b^5 - (4*a^2*c^(3/2)*Sqrt
[Pi]*Erfi[(Sqrt[c]*Sqrt[Log[f]])/(a + b*x)]*Log[f]^(3/2))/b^5 + (4*c^2*f^(c
/(a + b*x)^2)*(a + b*x)*Log[f]^2)/(15*b^5) + (a*c^2*ExpIntegralEi[(c*Log[f]
)/(a + b*x)^2]*Log[f]^2)/b^5 - (4*c^(5/2)*Sqrt[Pi]*Erfi[(Sqrt[c]*Sqrt[Log[f
]])/(a + b*x)]*Log[f]^(5/2))/(15*b^5)
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
```

```
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2206

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[((c +
 d*x)*F^(a + b*(c + d*x)^n))/d, x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2211

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rule 2226

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int f^{\frac{c}{(a+bx)^2}} x^4\,dx = \int \left(\frac{a^4 f^{\frac{c}{(a+bx)^2}}}{b^4} - \frac{4a^3 f^{\frac{c}{(a+bx)^2}}(a+bx)}{b^4} + \frac{6a^2 f^{\frac{c}{(a+bx)^2}}(a+bx)^2}{b^4} - \frac{4af^{\frac{c}{(a+bx)^2}}(a+bx)^3}{b^4} + \frac{f^{\frac{c}{(a+bx)^2}}(a+\right.$$

$$= \frac{\int f^{\frac{c}{(a+bx)^2}}(a+bx)^4\,dx}{b^4} - \frac{(4a)\int f^{\frac{c}{(a+bx)^2}}(a+bx)^3\,dx}{b^4} + \frac{\left(6a^2\right)\int f^{\frac{c}{(a+bx)^2}}(a+bx)^2\,dx}{b^4} - \frac{\left(4a^3\right)\int f^{\frac{c}{(a-}}}{}$$

$$= \frac{a^4 f^{\frac{c}{(a+bx)^2}}(a+bx)}{b^5} - \frac{2a^3 f^{\frac{c}{(a+bx)^2}}(a+bx)^2}{b^5} + \frac{2a^2 f^{\frac{c}{(a+bx)^2}}(a+bx)^3}{b^5} - \frac{af^{\frac{c}{(a+bx)^2}}(a+bx)^4}{b^5} + \frac{f^{\frac{c}{(a+bx)^2}}(a}{5b}$$

$$= \frac{a^4 f^{\frac{c}{(a+bx)^2}}(a+bx)}{b^5} - \frac{2a^3 f^{\frac{c}{(a+bx)^2}}(a+bx)^2}{b^5} + \frac{2a^2 f^{\frac{c}{(a+bx)^2}}(a+bx)^3}{b^5} - \frac{af^{\frac{c}{(a+bx)^2}}(a+bx)^4}{b^5} + \frac{f^{\frac{c}{(a+bx)^2}}(a}{5b}$$

$$= \frac{a^4 f^{\frac{c}{(a+bx)^2}}(a+bx)}{b^5} - \frac{2a^3 f^{\frac{c}{(a+bx)^2}}(a+bx)^2}{b^5} + \frac{2a^2 f^{\frac{c}{(a+bx)^2}}(a+bx)^3}{b^5} - \frac{af^{\frac{c}{(a+bx)^2}}(a+bx)^4}{b^5} + \frac{f^{\frac{c}{(a+bx)^2}}(a}{5b}$$

$$= \frac{a^4 f^{\frac{c}{(a+bx)^2}}(a+bx)}{b^5} - \frac{2a^3 f^{\frac{c}{(a+bx)^2}}(a+bx)^2}{b^5} + \frac{2a^2 f^{\frac{c}{(a+bx)^2}}(a+bx)^3}{b^5} - \frac{af^{\frac{c}{(a+bx)^2}}(a+bx)^4}{b^5} + \frac{f^{\frac{c}{(a+bx)^2}}(a}{5b}$$

$$= \frac{a^4 f^{\frac{c}{(a+bx)^2}}(a+bx)}{b^5} - \frac{2a^3 f^{\frac{c}{(a+bx)^2}}(a+bx)^2}{b^5} + \frac{2a^2 f^{\frac{c}{(a+bx)^2}}(a+bx)^3}{b^5} - \frac{af^{\frac{c}{(a+bx)^2}}(a+bx)^4}{b^5} + \frac{f^{\frac{c}{(a+bx)^2}}(a}{5b}$$

Mathematica [A] time = 0.22, size = 195, normalized size = 0.47

$$\frac{a\left(3a^4+47a^2c\log(f)+4c^2\log^2(f)\right)f^{\frac{c}{(a+bx)^2}}}{15b^5} + \frac{bxf^{\frac{c}{(a+bx)^2}}\left(c\log(f)\left(36a^2-9abx+2b^2x^2\right)+3b^4x^4+4c^2\log^2(f)\right)-}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c/(a + b*x)^2)*x^4,x]
```

```
[Out] (a*f^(c/(a + b*x)^2)*(3*a^4 + 47*a^2*c*Log[f] + 4*c^2*Log[f]^2))/(15*b^5) +
 (15*a*c*ExpIntegralEi[(c*Log[f])/(a + b*x)^2]*Log[f]*(2*a^2 + c*Log[f]) -
Sqrt[c]*Sqrt[Pi]*Erfi[(Sqrt[c]*Sqrt[Log[f]])/(a + b*x)]*Sqrt[Log[f]]*(15*a^
4 + 60*a^2*c*Log[f] + 4*c^2*Log[f]^2) + b*f^(c/(a + b*x)^2)*x*(3*b^4*x^4 +
c*(36*a^2 - 9*a*b*x + 2*b^2*x^2)*Log[f] + 4*c^2*Log[f]^2))/(15*b^5)
```

fricas [A] time = 0.45, size = 201, normalized size = 0.48

$$\frac{\sqrt{\pi}\left(15\,a^4b+60\,a^2bc\log(f)+4\,bc^2\log(f)^2\right)\sqrt{-\frac{c\log(f)}{b^2}}\ \mathrm{erf}\left(\frac{b\sqrt{-\frac{c\log(f)}{b^2}}}{bx+a}\right)+\left(3\,b^5x^5+3\,a^5+4\left(bc^2x+ac^2\right)\log(f)\right.}{1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^2)*x^4,x, algorithm="fricas")
```

```
[Out] 1/15*(sqrt(pi)*(15*a^4*b + 60*a^2*b*c*log(f) + 4*b*c^2*log(f)^2)*sqrt(-c*lo
g(f)/b^2)*erf(b*sqrt(-c*log(f)/b^2)/(b*x + a)) + (3*b^5*x^5 + 3*a^5 + 4*(b*
c^2*x + a*c^2)*log(f)^2 + (2*b^3*c*x^3 - 9*a*b^2*c*x^2 + 36*a^2*b*c*x + 47*
a^3*c)*log(f))*f^(c/(b^2*x^2 + 2*a*b*x + a^2)) + 15*(2*a^3*c*log(f) + a*c^2
*log(f)^2)*Ei(c*log(f)/(b^2*x^2 + 2*a*b*x + a^2)))/b^5
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{(bx+a)^2}}x^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^2)*x^4,x, algorithm="giac")
```

```
[Out] integrate(f^(c/(b*x + a)^2)*x^4, x)
```

maple [A] time = 0.11, size = 343, normalized size = 0.83

$$\frac{x^5 f^{\frac{c}{(bx+a)^2}}}{5}+\frac{2c\,x^3 f^{\frac{c}{(bx+a)^2}}\ln(f)}{15b^2}-\frac{3ac\,x^2 f^{\frac{c}{(bx+a)^2}}\ln(f)}{5b^3}-\frac{\sqrt{\pi}\ a^4c\,\mathrm{erf}\left(\frac{\sqrt{-c\ln(f)}}{bx+a}\right)\ln(f)}{\sqrt{-c\ln(f)}\ b^5}+\frac{12a^2cx\,f^{\frac{c}{(bx+a)^2}}\ln(f)}{5b^4}-\frac{4\sqrt{\pi}\ a^2}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(b*x+a)^2)*x^4,x)
```

```
[Out] -4/b^5*a^2*ln(f)^2*c^2*Pi^(1/2)/(-c*ln(f))^(1/2)*erf((-c*ln(f))^(1/2)/(b*x+
a))-3/5/b^3*ln(f)*c*f^(c/(b*x+a)^2)*a*x^2+12/5/b^4*ln(f)*c*f^(c/(b*x+a)^2)*
a^2*x-1/b^5*a^4*ln(f)*c*Pi^(1/2)/(-c*ln(f))^(1/2)*erf((-c*ln(f))^(1/2)/(b*x
+a))+1/5*f^(c/(b*x+a)^2)*x^5+1/5/b^5*a^5*f^(c/(b*x+a)^2)+47/15/b^5*ln(f)*c*
f^(c/(b*x+a)^2)*a^3+4/15/b^5*ln(f)^2*c^2*f^(c/(b*x+a)^2)*a-1/b^5*a*ln(f)^2*
c^2*Ei(1,-c*ln(f)/(b*x+a)^2)-2/b^5*a^3*ln(f)*c*Ei(1,-c*ln(f)/(b*x+a)^2)+2/1
5/b^2*ln(f)*c*f^(c/(b*x+a)^2)*x^3+4/15/b^4*ln(f)^2*c^2*f^(c/(b*x+a)^2)*x-4/
15/b^5*ln(f)^3*c^3*Pi^(1/2)/(-c*ln(f))^(1/2)*erf((-c*ln(f))^(1/2)/(b*x+a))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\left(3\,b^4x^5 + 2\,b^2cx^3\log(f) - 9\,abcx^2\log(f) + 4\left(9\,a^2c\log(f) + c^2\log(f)^2\right)x\right)f^{\frac{c}{b^2x^2+2\,abx+a^2}}}{15\,b^4} - \int \frac{2\left(18\,a^5c\log(f) + 2\,a^3\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^2)*x^4,x, algorithm="maxima")
```

```
[Out] 1/15*(3*b^4*x^5 + 2*b^2*c*x^3*log(f) - 9*a*b*c*x^2*log(f) + 4*(9*a^2*c*log(
f) + c^2*log(f)^2)*x)*f^(c/(b^2*x^2 + 2*a*b*x + a^2))/b^4 - integrate(2/15*
(18*a^5*c*log(f) + 2*a^3*c^2*log(f)^2 + 15*(2*a^3*b^2*c*log(f) + a*b^2*c^2*
log(f)^2)*x^2 + (45*a^4*b*c*log(f) - 30*a^2*b*c^2*log(f)^2 - 4*b*c^3*log(f)
^3)*x)*f^(c/(b^2*x^2 + 2*a*b*x + a^2))/(b^7*x^3 + 3*a*b^6*x^2 + 3*a^2*b^5*x
 + a^3*b^4), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int f^{\frac{c}{(a+b\,x)^2}}\,x^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x)^2)*x^4,x)
```

```
[Out] int(f^(c/(a + b*x)^2)*x^4, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{(a+bx)^2}}x^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a)**2)*x**4,x)
```

```
[Out] Integral(f**(c/(a + b*x)**2)*x**4, x)
```

3.225 $\int f^{\frac{c}{(a+bx)^2}} x^3 \, dx$

Optimal. Leaf size=291

$$\frac{\sqrt{\pi}\,a^3\sqrt{c}\,\sqrt{\log(f)}\,\mathrm{erfi}\left(\frac{\sqrt{c}\,\sqrt{\log(f)}}{a+bx}\right)}{b^4}-\frac{a^3(a+bx)f^{\frac{c}{(a+bx)^2}}}{b^4}-\frac{3a^2c\log(f)\mathrm{Ei}\left(\frac{c\log(f)}{(a+bx)^2}\right)}{2b^4}+\frac{3a^2(a+bx)^2f^{\frac{c}{(a+bx)^2}}}{2b^4}+\frac{2\sqrt{\pi}\,ac^{3/2}}{}$$

```
[Out] -a^3*f^(c/(b*x+a)^2)*(b*x+a)/b^4+3/2*a^2*f^(c/(b*x+a)^2)*(b*x+a)^2/b^4-a*f^
(c/(b*x+a)^2)*(b*x+a)^3/b^4+1/4*f^(c/(b*x+a)^2)*(b*x+a)^4/b^4-2*a*c*f^(c/(b
*x+a)^2)*(b*x+a)*ln(f)/b^4+1/4*c*f^(c/(b*x+a)^2)*(b*x+a)^2*ln(f)/b^4-3/2*a^
2*c*Ei(c*ln(f)/(b*x+a)^2)*ln(f)/b^4-1/4*c^2*Ei(c*ln(f)/(b*x+a)^2)*ln(f)^2/b
^4+2*a*c^(3/2)*erfi(c^(1/2)*ln(f)^(1/2)/(b*x+a))*ln(f)^(3/2)*Pi^(1/2)/b^4+a
^3*erfi(c^(1/2)*ln(f)^(1/2)/(b*x+a))*c^(1/2)*Pi^(1/2)*ln(f)^(1/2)/b^4
```

Rubi [A] time = 0.30, antiderivative size = 291, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.400, Rules used = {2226, 2206, 2211, 2204, 2214, 2210}

$$\frac{\sqrt{\pi}\,a^3\sqrt{c}\,\sqrt{\log(f)}\,\mathrm{Erfi}\left(\frac{\sqrt{c}\,\sqrt{\log(f)}}{a+bx}\right)}{b^4}-\frac{3a^2c\log(f)\mathrm{Ei}\left(\frac{c\log(f)}{(a+bx)^2}\right)}{2b^4}+\frac{3a^2(a+bx)^2f^{\frac{c}{(a+bx)^2}}}{2b^4}-\frac{a^3(a+bx)f^{\frac{c}{(a+bx)^2}}}{b^4}+\frac{2\sqrt{\pi}\,ac^{3/}}{}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c/(a + b*x)^2)*x^3,x]
```

```
[Out] -((a^3*f^(c/(a + b*x)^2)*(a + b*x))/b^4) + (3*a^2*f^(c/(a + b*x)^2)*(a + b*
x)^2)/(2*b^4) - (a*f^(c/(a + b*x)^2)*(a + b*x)^3)/b^4 + (f^(c/(a + b*x)^2)*
(a + b*x)^4)/(4*b^4) + (a^3*Sqrt[c]*Sqrt[Pi]*Erfi[(Sqrt[c]*Sqrt[Log[f]])/(a
 + b*x)]*Sqrt[Log[f]])/b^4 - (2*a*c*f^(c/(a + b*x)^2)*(a + b*x)*Log[f])/b^4
 + (c*f^(c/(a + b*x)^2)*(a + b*x)^2*Log[f])/(4*b^4) - (3*a^2*c*ExpIntegralE
i[(c*Log[f])/(a + b*x)^2]*Log[f])/(2*b^4) + (2*a*c^(3/2)*Sqrt[Pi]*Erfi[(Sqr
t[c]*Sqrt[Log[f]])/(a + b*x)]*Log[f]^(3/2))/b^4 - (c^2*ExpIntegralEi[(c*Log
[f])/(a + b*x)^2]*Log[f]^2)/(4*b^4)
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2206

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[((c +
 d*x)*F^(a + b*(c + d*x)^n))/d, x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
```

```
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2211

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rule 2226

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int f^{\frac{c}{(a+bx)^2}} x^3\,dx = \int \left(-\frac{a^3 f^{\frac{c}{(a+bx)^2}}}{b^3} + \frac{3a^2 f^{\frac{c}{(a+bx)^2}}(a+bx)}{b^3} - \frac{3af^{\frac{c}{(a+bx)^2}}(a+bx)^2}{b^3} + \frac{f^{\frac{c}{(a+bx)^2}}(a+bx)^3}{b^3}\right) dx$$

$$= \frac{\int f^{\frac{c}{(a+bx)^2}}(a+bx)^3\,dx}{b^3} - \frac{(3a)\int f^{\frac{c}{(a+bx)^2}}(a+bx)^2\,dx}{b^3} + \frac{\left(3a^2\right)\int f^{\frac{c}{(a+bx)^2}}(a+bx)\,dx}{b^3} - \frac{a^3 \int f^{\frac{c}{(a+bx)^2}}}{b^3}$$

$$= -\frac{a^3 f^{\frac{c}{(a+bx)^2}}(a+bx)}{b^4} + \frac{3a^2 f^{\frac{c}{(a+bx)^2}}(a+bx)^2}{2b^4} - \frac{af^{\frac{c}{(a+bx)^2}}(a+bx)^3}{b^4} + \frac{f^{\frac{c}{(a+bx)^2}}(a+bx)^4}{4b^4} + \frac{(c\log(f)}{}$$

$$= -\frac{a^3 f^{\frac{c}{(a+bx)^2}}(a+bx)}{b^4} + \frac{3a^2 f^{\frac{c}{(a+bx)^2}}(a+bx)^2}{2b^4} - \frac{af^{\frac{c}{(a+bx)^2}}(a+bx)^3}{b^4} + \frac{f^{\frac{c}{(a+bx)^2}}(a+bx)^4}{4b^4} - \frac{2acf^{\frac{c}{(a+bx}}}{}$$

$$= -\frac{a^3 f^{\frac{c}{(a+bx)^2}}(a+bx)}{b^4} + \frac{3a^2 f^{\frac{c}{(a+bx)^2}}(a+bx)^2}{2b^4} - \frac{af^{\frac{c}{(a+bx)^2}}(a+bx)^3}{b^4} + \frac{f^{\frac{c}{(a+bx)^2}}(a+bx)^4}{4b^4} + \frac{a^3\sqrt{c}\sqrt{\pi}}{}$$

$$= -\frac{a^3 f^{\frac{c}{(a+bx)^2}}(a+bx)}{b^4} + \frac{3a^2 f^{\frac{c}{(a+bx)^2}}(a+bx)^2}{2b^4} - \frac{af^{\frac{c}{(a+bx)^2}}(a+bx)^3}{b^4} + \frac{f^{\frac{c}{(a+bx)^2}}(a+bx)^4}{4b^4} + \frac{a^3\sqrt{c}\sqrt{\pi}}{}$$

Mathematica [A] time = 0.15, size = 148, normalized size = 0.51

$$\frac{4\sqrt{\pi}\,a\sqrt{c}\,\sqrt{\log(f)}\,\left(a^2+2c\log(f)\right)\operatorname{erfi}\left(\frac{\sqrt{c}\,\sqrt{\log(f)}}{a+bx}\right) - c\log(f)\left(6a^2+c\log(f)\right)\operatorname{Ei}\left(\frac{c\log(f)}{(a+bx)^2}\right) + bxf^{\frac{c}{(a+bx)^2}}\left(-6ac\log\right.}{4b^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c/(a + b*x)^2)*x^3,x]
```

```
[Out] -1/4*(a^2*f^(c/(a + b*x)^2)*(a^2 + 7*c*Log[f]))/b^4 + (-(c*ExpIntegralEi[(c
*Log[f])/(a + b*x)^2]*Log[f]*(6*a^2 + c*Log[f])) + 4*a*Sqrt[c]*Sqrt[Pi]*Erf
i[(Sqrt[c]*Sqrt[Log[f]])/(a + b*x)]*Sqrt[Log[f]]*(a^2 + 2*c*Log[f]) + b*f^(
c/(a + b*x)^2)*x*(b^3*x^3 - 6*a*c*Log[f] + b*c*x*Log[f]))/(4*b^4)
```

fricas [A] time = 0.47, size = 156, normalized size = 0.54

$$-\frac{4\sqrt{\pi}\left(a^3b+2\,abc\log(f)\right)\sqrt{-\frac{c\log(f)}{b^2}}\,\operatorname{erf}\left(\frac{b\sqrt{-\frac{c\log(f)}{b^2}}}{bx+a}\right) - \left(b^4x^4 - a^4 + \left(b^2cx^2 - 6\,abcx - 7\,a^2c\right)\log(f)\right)f^{\frac{c}{b^2x^2+2\,abx+}}}{4\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^2)*x^3,x, algorithm="fricas")
```

```
[Out] -1/4*(4*sqrt(pi)*(a^3*b + 2*a*b*c*log(f))*sqrt(-c*log(f)/b^2)*erf(b*sqrt(-c
*log(f)/b^2)/(b*x + a)) - (b^4*x^4 - a^4 + (b^2*c*x^2 - 6*a*b*c*x - 7*a^2*c
)*log(f))*f^(c/(b^2*x^2 + 2*a*b*x + a^2)) + (6*a^2*c*log(f) + c^2*log(f)^2)
*Ei(c*log(f)/(b^2*x^2 + 2*a*b*x + a^2)))/b^4
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{(bx+a)^2}} x^3 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^2)*x^3,x, algorithm="giac")
```

```
[Out] integrate(f^(c/(b*x + a)^2)*x^3, x)
```

maple [A] time = 0.08, size = 228, normalized size = 0.78

$$\frac{x^4 f^{\frac{c}{(bx+a)^2}}}{4}+\frac{c\,x^2 f^{\frac{c}{(bx+a)^2}} \ln(f)}{4b^2}+\frac{\sqrt{\pi}\,a^3 c\,\mathrm{erf}\left(\frac{\sqrt{-c\ln(f)}}{bx+a}\right)\ln(f)}{\sqrt{-c\ln(f)}\,b^4}-\frac{3acx\,f^{\frac{c}{(bx+a)^2}} \ln(f)}{2b^3}+\frac{2\sqrt{\pi}\,a\,c^2\,\mathrm{erf}\left(\frac{\sqrt{-c\ln(f)}}{bx+a}\right)\ln(f)^2}{\sqrt{-c\ln(f)}\,b^4}-\frac{a}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(1/(b*x+a)^2*c)*x^3,x)
```

```
[Out] 1/4*f^(1/(b*x+a)^2*c)*x^4-1/4/b^4*f^(1/(b*x+a)^2*c)*a^4+1/4/b^2*ln(f)*c*f^(
1/(b*x+a)^2*c)*x^2-3/2/b^3*ln(f)*c*f^(1/(b*x+a)^2*c)*a*x-7/4/b^4*ln(f)*c*f^
(1/(b*x+a)^2*c)*a^2+1/4/b^4*ln(f)^2*c^2*Ei(1,-1/(b*x+a)^2*c*ln(f))+2/b^4*a*
ln(f)^2*c^2*Pi^(1/2)/(-c*ln(f))^(1/2)*erf((-c*ln(f))^(1/2)/(b*x+a))+3/2/b^4
*a^2*ln(f)*c*Ei(1,-1/(b*x+a)^2*c*ln(f))+1/b^4*a^3*ln(f)*c*Pi^(1/2)/(-c*ln(f
))^(1/2)*erf((-c*ln(f))^(1/2)/(b*x+a))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\left(b^3x^4 + bcx^2\log(f) - 6\,acx\log(f)\right)f^{\frac{c}{b^2x^2+2\,abx+a^2}}}{4\,b^3}+\int \frac{\left(3\,a^4c\log(f) + \left(6\,a^2b^2c\log(f) + b^2c^2\log(f)^2\right)x^2 + 2\left(4\,a^3bc\right.\right.}{2\left(b^6x^3 + 3\,ab^5x^2 + 3\,a^2b^4x +\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^2)*x^3,x, algorithm="maxima")
```

```
[Out] 1/4*(b^3*x^4 + b*c*x^2*log(f) - 6*a*c*x*log(f))*f^(c/(b^2*x^2 + 2*a*b*x + a
^2))/b^3 + integrate(1/2*(3*a^4*c*log(f) + (6*a^2*b^2*c*log(f) + b^2*c^2*lo
```

```
g(f)^2)*x^2 + 2*(4*a^3*b*c*log(f) - 3*a*b*c^2*log(f)^2)*x)*f^(c/(b^2*x^2 +
2*a*b*x + a^2))/(b^6*x^3 + 3*a*b^5*x^2 + 3*a^2*b^4*x + a^3*b^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int f^{\frac{c}{(a+b\,x)^2}}\,x^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x)^2)*x^3,x)
[Out] int(f^(c/(a + b*x)^2)*x^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{(a+bx)^2}}x^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a)**2)*x**3,x)
[Out] Integral(f**(c/(a + b*x)**2)*x**3, x)
```

3.226 $\int f^{\frac{c}{(a+bx)^2}} x^2\,dx$

Optimal. Leaf size=206

$$-\frac{\sqrt{\pi}\,a^2\sqrt{c}\,\sqrt{\log(f)}\,\mathrm{erfi}\left(\frac{\sqrt{c}\,\sqrt{\log(f)}}{a+bx}\right)}{b^3}+\frac{a^2(a+bx)f^{\frac{c}{(a+bx)^2}}}{b^3}-\frac{2\sqrt{\pi}\,c^{3/2}\log^{\frac{3}{2}}(f)\mathrm{erfi}\left(\frac{\sqrt{c}\,\sqrt{\log(f)}}{a+bx}\right)}{3b^3}+\frac{ac\log(f)\mathrm{Ei}\left(\frac{c\log(f)}{(a+bx)^2}\right)}{b^3}$$

```
[Out] a^2*f^(c/(b*x+a)^2)*(b*x+a)/b^3-a*f^(c/(b*x+a)^2)*(b*x+a)^2/b^3+1/3*f^(c/(b
*x+a)^2)*(b*x+a)^3/b^3+2/3*c*f^(c/(b*x+a)^2)*(b*x+a)*ln(f)/b^3+a*c*Ei(c*ln(
f)/(b*x+a)^2)*ln(f)/b^3-2/3*c^(3/2)*erfi(c^(1/2)*ln(f)^(1/2)/(b*x+a))*ln(f)
^(3/2)*Pi^(1/2)/b^3-a^2*erfi(c^(1/2)*ln(f)^(1/2)/(b*x+a))*c^(1/2)*Pi^(1/2)*
ln(f)^(1/2)/b^3
```

Rubi [A] time = 0.21, antiderivative size = 206, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.400, Rules used = {2226, 2206, 2211, 2204, 2214, 2210}

$$-\frac{\sqrt{\pi}\,a^2\sqrt{c}\,\sqrt{\log(f)}\,\mathrm{Erfi}\left(\frac{\sqrt{c}\,\sqrt{\log(f)}}{a+bx}\right)}{b^3}+\frac{a^2(a+bx)f^{\frac{c}{(a+bx)^2}}}{b^3}-\frac{2\sqrt{\pi}\,c^{3/2}\log^{\frac{3}{2}}(f)\mathrm{Erfi}\left(\frac{\sqrt{c}\,\sqrt{\log(f)}}{a+bx}\right)}{3b^3}+\frac{ac\log(f)\mathrm{Ei}\left(\frac{c\log(f)}{(a+bx)^2}\right)}{b^3}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c/(a + b*x)^2)*x^2,x]
```

```
[Out] (a^2*f^(c/(a + b*x)^2)*(a + b*x))/b^3 - (a*f^(c/(a + b*x)^2)*(a + b*x)^2)/b
^3 + (f^(c/(a + b*x)^2)*(a + b*x)^3)/(3*b^3) - (a^2*Sqrt[c]*Sqrt[Pi]*Erfi[(
Sqrt[c]*Sqrt[Log[f]])/(a + b*x)]*Sqrt[Log[f]])/b^3 + (2*c*f^(c/(a + b*x)^2)
*(a + b*x)*Log[f])/(3*b^3) + (a*c*ExpIntegralEi[(c*Log[f])/(a + b*x)^2]*Log
[f])/b^3 - (2*c^(3/2)*Sqrt[Pi]*Erfi[(Sqrt[c]*Sqrt[Log[f]])/(a + b*x)]*Log[f
]^(3/2))/(3*b^3)
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2206

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[((c +
 d*x)*F^(a + b*(c + d*x)^n))/d, x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2211

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rule 2226

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int f^{\frac{c}{(a+bx)^2}}x^2\,dx = \int\left(\frac{a^2f^{\frac{c}{(a+bx)^2}}}{b^2} - \frac{2af^{\frac{c}{(a+bx)^2}}(a+bx)}{b^2} + \frac{f^{\frac{c}{(a+bx)^2}}(a+bx)^2}{b^2}\right)dx$$

$$= \frac{\int f^{\frac{c}{(a+bx)^2}}(a+bx)^2\,dx}{b^2} - \frac{(2a)\int f^{\frac{c}{(a+bx)^2}}(a+bx)\,dx}{b^2} + \frac{a^2\int f^{\frac{c}{(a+bx)^2}}\,dx}{b^2}$$

$$= \frac{a^2f^{\frac{c}{(a+bx)^2}}(a+bx)}{b^3} - \frac{af^{\frac{c}{(a+bx)^2}}(a+bx)^2}{b^3} + \frac{f^{\frac{c}{(a+bx)^2}}(a+bx)^3}{3b^3} + \frac{(2c\log(f))\int f^{\frac{c}{(a+bx)^2}}\,dx}{3b^2} - \frac{(2ac\log}{}$$

$$= \frac{a^2f^{\frac{c}{(a+bx)^2}}(a+bx)}{b^3} - \frac{af^{\frac{c}{(a+bx)^2}}(a+bx)^2}{b^3} + \frac{f^{\frac{c}{(a+bx)^2}}(a+bx)^3}{3b^3} + \frac{2cf^{\frac{c}{(a+bx)^2}}(a+bx)\log(f)}{3b^3} + \frac{ac\mathrm{Ei}\left(\frac{c}{(}\right.}{}$$

$$= \frac{a^2f^{\frac{c}{(a+bx)^2}}(a+bx)}{b^3} - \frac{af^{\frac{c}{(a+bx)^2}}(a+bx)^2}{b^3} + \frac{f^{\frac{c}{(a+bx)^2}}(a+bx)^3}{3b^3} - \frac{a^2\sqrt{c}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{c}\sqrt{\log(f)}}{a+bx}\right)\sqrt{\log(f)}}{b^3}$$

$$= \frac{a^2f^{\frac{c}{(a+bx)^2}}(a+bx)}{b^3} - \frac{af^{\frac{c}{(a+bx)^2}}(a+bx)^2}{b^3} + \frac{f^{\frac{c}{(a+bx)^2}}(a+bx)^3}{3b^3} - \frac{a^2\sqrt{c}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{c}\sqrt{\log(f)}}{a+bx}\right)\sqrt{\log(f)}}{b^3}$$

Mathematica [A] time = 0.12, size = 131, normalized size = 0.64

$$\frac{a\left(a^2+2c\log(f)\right)f^{\frac{c}{(a+bx)^2}}}{3b^3} + \frac{-\sqrt{\pi}\sqrt{c}\sqrt{\log(f)}\left(3a^2+2c\log(f)\right)\mathrm{erfi}\left(\frac{\sqrt{c}\sqrt{\log(f)}}{a+bx}\right) + bxf^{\frac{c}{(a+bx)^2}}\left(b^2x^2+2c\log(f)\right)+}{3b^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c/(a + b*x)^2)*x^2,x]
```

```
[Out] (a*f^(c/(a + b*x)^2)*(a^2 + 2*c*Log[f]))/(3*b^3) + (3*a*c*ExpIntegralEi[(c*
Log[f])/(a + b*x)^2]*Log[f] - Sqrt[c]*Sqrt[Pi]*Erfi[(Sqrt[c]*Sqrt[Log[f]])/
(a + b*x)]*Sqrt[Log[f]]*(3*a^2 + 2*c*Log[f]) + b*f^(c/(a + b*x)^2)*x*(b^2*x
^2 + 2*c*Log[f]))/(3*b^3)
```

fricas [A] time = 0.44, size = 128, normalized size = 0.62

$$\frac{3\,ac\mathrm{Ei}\left(\frac{c\log(f)}{b^2x^2+2\,abx+a^2}\right)\log(f) + \sqrt{\pi}\left(3\,a^2b+2\,bc\log(f)\right)\sqrt{-\frac{c\log(f)}{b^2}}\,\mathrm{erf}\left(\frac{b\sqrt{-\frac{c\log(f)}{b^2}}}{bx+a}\right) + \left(b^3x^3+a^3+2\,(bcx+ac)\log\right.}{3\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^2)*x^2,x, algorithm="fricas")
```

```
[Out] 1/3*(3*a*c*Ei(c*log(f)/(b^2*x^2 + 2*a*b*x + a^2))*log(f) + sqrt(pi)*(3*a^2*
b + 2*b*c*log(f))*sqrt(-c*log(f)/b^2)*erf(b*sqrt(-c*log(f)/b^2)/(b*x + a))
+ (b^3*x^3 + a^3 + 2*(b*c*x + a*c)*log(f))*f^(c/(b^2*x^2 + 2*a*b*x + a^2)))
/b^3
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{(bx+a)^2}} x^2 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^2)*x^2,x, algorithm="giac")
```

```
[Out] integrate(f^(c/(b*x + a)^2)*x^2, x)
```

maple [A] time = 0.07, size = 175, normalized size = 0.85

$$\frac{x^3 f^{\frac{c}{(bx+a)^2}}}{3} - \frac{\sqrt{\pi}\, a^2 c \,\mathrm{erf}\left(\frac{\sqrt{-c\ln(f)}}{bx+a}\right)\ln(f)}{\sqrt{-c\ln(f)}\, b^3} + \frac{2cx\, f^{\frac{c}{(bx+a)^2}}\ln(f)}{3b^2} - \frac{2\sqrt{\pi}\, c^2 \,\mathrm{erf}\left(\frac{\sqrt{-c\ln(f)}}{bx+a}\right)\ln(f)^2}{3\sqrt{-c\ln(f)}\, b^3} + \frac{a^3 f^{\frac{c}{(bx+a)^2}}}{3b^3} + \frac{2ac\, f^{\frac{c}{(bx+a}}}{3b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(1/(b*x+a)^2*c)*x^2,x)
```

```
[Out] 1/3*f^(1/(b*x+a)^2*c)*x^3+1/3/b^3*a^3*f^(1/(b*x+a)^2*c)+2/3/b^2*ln(f)*c*f^(
1/(b*x+a)^2*c)*x+2/3/b^3*ln(f)*c*f^(1/(b*x+a)^2*c)*a-2/3/b^3*ln(f)^2*c^2*Pi
^(1/2)/(-c*ln(f))^(1/2)*erf((-c*ln(f))^(1/2)/(b*x+a))-1/b^3*a^2*ln(f)*c*Pi^
(1/2)/(-c*ln(f))^(1/2)*erf((-c*ln(f))^(1/2)/(b*x+a))-1/b^3*a*ln(f)*c*Ei(1,-
1/(b*x+a)^2*c*ln(f))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\left(b^2x^3 + 2\,cx\log(f)\right)f^{\frac{c}{b^2x^2+2\,abx+a^2}}}{3\,b^2} - \int \frac{2\left(3\,ab^2cx^2\log(f) + a^3c\log(f) + \left(3\,a^2bc\log(f) - 2\,bc^2\log(f)^2\right)x\right)f^{\frac{c}{b^2x^2+2\,ab}}}{3\left(b^5x^3 + 3\,ab^4x^2 + 3\,a^2b^3x + a^3b^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^2)*x^2,x, algorithm="maxima")
```

```
[Out] 1/3*(b^2*x^3 + 2*c*x*log(f))*f^(c/(b^2*x^2 + 2*a*b*x + a^2))/b^2 - integrat
e(2/3*(3*a*b^2*c*x^2*log(f) + a^3*c*log(f) + (3*a^2*b*c*log(f) - 2*b*c^2*lo
g(f)^2)*x)*f^(c/(b^2*x^2 + 2*a*b*x + a^2))/(b^5*x^3 + 3*a*b^4*x^2 + 3*a^2*b
^3*x + a^3*b^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int f^{\frac{c}{(a+b\,x)^2}}\,x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x)^2)*x^2,x)
[Out] int(f^(c/(a + b*x)^2)*x^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{(a+bx)^2}}x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a)**2)*x**2,x)
[Out] Integral(f**(c/(a + b*x)**2)*x**2, x)
```

3.227 $\int f^{\frac{c}{(a+bx)^2}} x\,dx$

Optimal. Leaf size=111

$$\frac{\sqrt{\pi}\, a\sqrt{c}\, \sqrt{\log(f)}\, \text{erfi}\left(\frac{\sqrt{c}\,\sqrt{\log(f)}}{a+bx}\right)}{b^2}-\frac{c\log(f)\text{Ei}\left(\frac{c\log(f)}{(a+bx)^2}\right)}{2b^2}+\frac{(a+bx)^2 f^{\frac{c}{(a+bx)^2}}}{2b^2}-\frac{a(a+bx)f^{\frac{c}{(a+bx)^2}}}{b^2}$$

```
[Out] -a*f^(c/(b*x+a)^2)*(b*x+a)/b^2+1/2*f^(c/(b*x+a)^2)*(b*x+a)^2/b^2-1/2*c*Ei(c
*ln(f)/(b*x+a)^2)*ln(f)/b^2+a*erfi(c^(1/2)*ln(f)^(1/2)/(b*x+a))*c^(1/2)*Pi^
(1/2)*ln(f)^(1/2)/b^2
```

Rubi [A] time = 0.12, antiderivative size = 111, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.462, Rules used = {2226, 2206, 2211, 2204, 2214, 2210}

$$\frac{\sqrt{\pi}\, a\sqrt{c}\, \sqrt{\log(f)}\, \text{Erfi}\left(\frac{\sqrt{c}\,\sqrt{\log(f)}}{a+bx}\right)}{b^2}-\frac{c\log(f)\text{Ei}\left(\frac{c\log(f)}{(a+bx)^2}\right)}{2b^2}+\frac{(a+bx)^2 f^{\frac{c}{(a+bx)^2}}}{2b^2}-\frac{a(a+bx)f^{\frac{c}{(a+bx)^2}}}{b^2}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c/(a + b*x)^2)*x,x]
```

```
[Out] -((a*f^(c/(a + b*x)^2)*(a + b*x))/b^2) + (f^(c/(a + b*x)^2)*(a + b*x)^2)/(2
*b^2) + (a*Sqrt[c]*Sqrt[Pi]*Erfi[(Sqrt[c]*Sqrt[Log[f]])/(a + b*x)]*Sqrt[Log
[f]])/b^2 - (c*ExpIntegralEi[(c*Log[f])/(a + b*x)^2]*Log[f])/(2*b^2)
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2206

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[((c +
 d*x)*F^(a + b*(c + d*x)^n))/d, x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
```

```
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2211

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rule 2226

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int f^{\frac{c}{(a+bx)^2}} x\,dx = \int \left(-\frac{af^{\frac{c}{(a+bx)^2}}}{b} + \frac{f^{\frac{c}{(a+bx)^2}}(a+bx)}{b}\right) dx$$

$$= \frac{\int f^{\frac{c}{(a+bx)^2}}(a+bx)\,dx}{b} - \frac{a\int f^{\frac{c}{(a+bx)^2}}\,dx}{b}$$

$$= -\frac{af^{\frac{c}{(a+bx)^2}}(a+bx)}{b^2} + \frac{f^{\frac{c}{(a+bx)^2}}(a+bx)^2}{2b^2} + \frac{(c\log(f))\int \frac{f^{\frac{c}{(a+bx)^2}}}{a+bx}\,dx}{b} - \frac{(2ac\log(f))\int \frac{f^{\frac{c}{(a+bx)^2}}}{(a+bx)^2}\,dx}{b}$$

$$= -\frac{af^{\frac{c}{(a+bx)^2}}(a+bx)}{b^2} + \frac{f^{\frac{c}{(a+bx)^2}}(a+bx)^2}{2b^2} - \frac{c\text{Ei}\left(\frac{c\log(f)}{(a+bx)^2}\right)\log(f)}{2b^2} + \frac{(2ac\log(f))\,\text{Subst}\left(\int f^{cx^2}\,dx, x, \ldots\right.}{b^2}$$

$$= -\frac{af^{\frac{c}{(a+bx)^2}}(a+bx)}{b^2} + \frac{f^{\frac{c}{(a+bx)^2}}(a+bx)^2}{2b^2} + \frac{a\sqrt{c}\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{c}\sqrt{\log(f)}}{a+bx}\right)\sqrt{\log(f)}}{b^2} - \frac{c\text{Ei}\left(\frac{c\log(f)}{(a+bx)^2}\right)\log(f}{2b^2}$$

Mathematica [A] time = 0.05, size = 89, normalized size = 0.80

$$\frac{\left(b^2x^2-a^2\right)f^{\frac{c}{(a+bx)^2}}+2\sqrt{\pi}\,a\sqrt{c}\,\sqrt{\log(f)}\,\mathrm{erfi}\left(\frac{\sqrt{c}\,\sqrt{\log(f)}}{a+bx}\right)-c\log(f)\mathrm{Ei}\left(\frac{c\log(f)}{(a+bx)^2}\right)}{2b^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c/(a + b*x)^2)*x,x]
```

```
[Out] (f^(c/(a + b*x)^2)*(-a^2 + b^2*x^2) + 2*a*Sqrt[c]*Sqrt[Pi]*Erfi[(Sqrt[c]*Sq
rt[Log[f]])/(a + b*x)]*Sqrt[Log[f]] - c*ExpIntegralEi[(c*Log[f])/(a + b*x)^
2]*Log[f])/(2*b^2)
```

fricas [A] time = 0.42, size = 107, normalized size = 0.96

$$-\frac{2\sqrt{\pi}\,ab\sqrt{-\frac{c\log(f)}{b^2}}\,\mathrm{erf}\left(\frac{b\sqrt{-\frac{c\log(f)}{b^2}}}{bx+a}\right)+c\mathrm{Ei}\left(\frac{c\log(f)}{b^2x^2+2\,abx+a^2}\right)\log(f)-\left(b^2x^2-a^2\right)f^{\frac{c}{b^2x^2+2\,abx+a^2}}}{2\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^2)*x,x, algorithm="fricas")
```

```
[Out] -1/2*(2*sqrt(pi)*a*b*sqrt(-c*log(f)/b^2)*erf(b*sqrt(-c*log(f)/b^2)/(b*x + a
)) + c*Ei(c*log(f)/(b^2*x^2 + 2*a*b*x + a^2))*log(f) - (b^2*x^2 - a^2)*f^(c
/(b^2*x^2 + 2*a*b*x + a^2)))/b^2
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{(bx+a)^2}}x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^2)*x,x, algorithm="giac")
```

```
[Out] integrate(f^(c/(b*x + a)^2)*x, x)
```

maple [A] time = 0.07, size = 93, normalized size = 0.84

$$\frac{x^2f^{\frac{c}{(bx+a)^2}}}{2}+\frac{\sqrt{\pi}\;ac\,\mathrm{erf}\left(\frac{\sqrt{-c\ln(f)}}{bx+a}\right)\ln(f)}{\sqrt{-c\ln(f)}\;b^2}-\frac{a^2f^{\frac{c}{(bx+a)^2}}}{2b^2}+\frac{c\,\mathrm{Ei}\left(1,-\frac{c\ln(f)}{(bx+a)^2}\right)\ln(f)}{2b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(1/(b*x+a)^2*c)*x,x)
```

```
[Out] 1/2*f^(1/(b*x+a)^2*c)*x^2-1/2/b^2*f^(1/(b*x+a)^2*c)*a^2+1/2/b^2*ln(f)*c*Ei(
1,-1/(b*x+a)^2*c*ln(f))+1/b^2*a*ln(f)*c*Pi^(1/2)/(-c*ln(f))^(1/2)*erf((-c*l
n(f))^(1/2)/(b*x+a))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$bc \int \frac{f^{\frac{c}{b^2x^2+2\,abx+a^2}}x^2}{b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3}\,dx\log(f)+\frac{1}{2}\,f^{\frac{c}{b^2x^2+2\,abx+a^2}}x^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^2)*x,x, algorithm="maxima")
```

```
[Out] b*c*integrate(f^(c/(b^2*x^2 + 2*a*b*x + a^2))*x^2/(b^3*x^3 + 3*a*b^2*x^2 +
3*a^2*b*x + a^3), x)*log(f) + 1/2*f^(c/(b^2*x^2 + 2*a*b*x + a^2))*x^2
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int f^{\frac{c}{(a+b\,x)^2}}\,x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x)^2)*x,x)
```

```
[Out] int(f^(c/(a + b*x)^2)*x, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{(a+bx)^2}}x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a)**2)*x,x)
```

```
[Out] Integral(f**(c/(a + b*x)**2)*x, x)
```

3.228 $\int f^{\frac{c}{(a+bx)^2}} dx$

Optimal. Leaf size=62

$$\frac{(a+bx)f^{\frac{c}{(a+bx)^2}}}{b}-\frac{\sqrt{\pi}\sqrt{c}\sqrt{\log(f)}\,\mathrm{erfi}\left(\frac{\sqrt{c}\sqrt{\log(f)}}{a+bx}\right)}{b}$$

```
[Out] f^(c/(b*x+a)^2)*(b*x+a)/b-erfi(c^(1/2)*ln(f)^(1/2)/(b*x+a))*c^(1/2)*Pi^(1/2
)*ln(f)^(1/2)/b
```

Rubi [A] time = 0.04, antiderivative size = 62, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {2206, 2211, 2204}

$$\frac{(a+bx)f^{\frac{c}{(a+bx)^2}}}{b}-\frac{\sqrt{\pi}\sqrt{c}\sqrt{\log(f)}\,\mathrm{Erfi}\left(\frac{\sqrt{c}\sqrt{\log(f)}}{a+bx}\right)}{b}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c/(a + b*x)^2),x]
```

```
[Out] (f^(c/(a + b*x)^2)*(a + b*x))/b - (Sqrt[c]*Sqrt[Pi]*Erfi[(Sqrt[c]*Sqrt[Log[
f]])/(a + b*x)]*Sqrt[Log[f]])/b
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2206

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[((c +
 d*x)*F^(a + b*(c + d*x)^n))/d, x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2211

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rubi steps

$$\int f^{\frac{c}{(a+bx)^2}}\,dx = \frac{f^{\frac{c}{(a+bx)^2}}(a+bx)}{b} + (2c\log(f))\int \frac{f^{\frac{c}{(a+bx)^2}}}{(a+bx)^2}\,dx$$
$$= \frac{f^{\frac{c}{(a+bx)^2}}(a+bx)}{b} - \frac{(2c\log(f))\,\mathrm{Subst}\left(\int f^{cx^2}\,dx, x, \frac{1}{a+bx}\right)}{b}$$
$$= \frac{f^{\frac{c}{(a+bx)^2}}(a+bx)}{b} - \frac{\sqrt{c}\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{c}\,\sqrt{\log(f)}}{a+bx}\right)\sqrt{\log(f)}}{b}$$

Mathematica [A] time = 0.02, size = 62, normalized size = 1.00

$$\frac{(a+bx)f^{\frac{c}{(a+bx)^2}}}{b} - \frac{\sqrt{\pi}\,\sqrt{c}\,\sqrt{\log(f)}\,\mathrm{erfi}\left(\frac{\sqrt{c}\,\sqrt{\log(f)}}{a+bx}\right)}{b}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c/(a + b*x)^2),x]
```

```
[Out] (f^(c/(a + b*x)^2)*(a + b*x))/b - (Sqrt[c]*Sqrt[Pi]*Erfi[(Sqrt[c]*Sqrt[Log[
f]])/(a + b*x)]*Sqrt[Log[f]])/b
```

fricas [A] time = 0.45, size = 68, normalized size = 1.10

$$\frac{\sqrt{\pi}\,b\sqrt{-\frac{c\log(f)}{b^2}}\ \mathrm{erf}\left(\frac{b\sqrt{-\frac{c\log(f)}{b^2}}}{bx+a}\right) + (bx+a)f^{\frac{c}{b^2x^2+2\,abx+a^2}}}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^2),x, algorithm="fricas")
```

```
[Out] (sqrt(pi)*b*sqrt(-c*log(f)/b^2)*erf(b*sqrt(-c*log(f)/b^2)/(b*x + a)) + (b*x
 + a)*f^(c/(b^2*x^2 + 2*a*b*x + a^2)))/b
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{(bx+a)^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^2),x, algorithm="giac")
```

```
[Out] integrate(f^(c/(b*x + a)^2), x)
```

maple [A] time = 0.06, size = 65, normalized size = 1.05

$$-\frac{\sqrt{\pi}\, c \operatorname{erf}\left(\frac{\sqrt{-c \ln(f)}}{bx+a}\right) \ln(f)}{\sqrt{-c \ln(f)}\, b} + x\, f^{\frac{c}{(bx+a)^2}} + \frac{a\, f^{\frac{c}{(bx+a)^2}}}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(1/(b*x+a)^2*c),x)
```

```
[Out] f^(1/(b*x+a)^2*c)*x+1/b*f^(1/(b*x+a)^2*c)*a-1/b*ln(f)*c*Pi^(1/2)/(-c*ln(f))
^(1/2)*erf((-c*ln(f))^(1/2)/(b*x+a))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$2\, bc \int \frac{f^{\frac{c}{b^2x^2+2\,abx+a^2}}\, x}{b^3x^3 + 3\,ab^2x^2 + 3\,a^2bx + a^3}\, dx \log(f) + f^{\frac{c}{b^2x^2+2\,abx+a^2}}\, x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^2),x, algorithm="maxima")
```

```
[Out] 2*b*c*integrate(f^(c/(b^2*x^2 + 2*a*b*x + a^2))*x/(b^3*x^3 + 3*a*b^2*x^2 +
3*a^2*b*x + a^3), x)*log(f) + f^(c/(b^2*x^2 + 2*a*b*x + a^2))*x
```

mupad [B] time = 3.64, size = 53, normalized size = 0.85

$$\frac{f^{\frac{c}{(a+b\,x)^2}}\, (a + b\,x)}{b} - \frac{c\,\sqrt{\pi}\, \operatorname{erfi}\left(\frac{\sqrt{c\, \ln(f)}}{a+b\,x}\right) \ln(f)}{b\,\sqrt{c\, \ln(f)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x)^2),x)
```

```
[Out] (f^(c/(a + b*x)^2)*(a + b*x))/b - (c*pi^(1/2)*erfi((c*log(f))^(1/2)/(a + b*
x))*log(f))/(b*(c*log(f))^(1/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{(a+bx)^2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a)**2),x)
[Out] Integral(f**(c/(a + b*x)**2), x)
```

3.229 $\int \frac{f^{\frac{c}{(a+bx)^2}}}{x}\,dx$

Optimal. Leaf size=18

$$\text{Int}\left(\frac{f^{\frac{c}{(a+bx)^2}}}{x},x\right)$$

[Out] Unintegrable(f^(c/(b*x+a)^2)/x,x)

Rubi [A] time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{f^{\frac{c}{(a+bx)^2}}}{x}\,dx$$

Verification is Not applicable to the result.

[In] Int[f^(c/(a + b*x)^2)/x,x]

[Out] Defer[Int][f^(c/(a + b*x)^2)/x, x]

Rubi steps

$$\int \frac{f^{\frac{c}{(a+bx)^2}}}{x}\,dx = \int \frac{f^{\frac{c}{(a+bx)^2}}}{x}\,dx$$

Mathematica [A] time = 0.07, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{(a+bx)^2}}}{x}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[f^(c/(a + b*x)^2)/x,x]

[Out] Integrate[f^(c/(a + b*x)^2)/x, x]

fricas [A] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{f^{\frac{c}{b^2x^2+2\,abx+a^2}}}{x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^2)/x,x, algorithm="fricas")
[Out] integral(f^(c/(b^2*x^2 + 2*a*b*x + a^2))/x, x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{(bx+a)^2}}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^2)/x,x, algorithm="giac")
[Out] integrate(f^(c/(b*x + a)^2)/x, x)
```

maple [A] time = 0.06, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{(bx+a)^2}}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(1/(b*x+a)^2*c)/x,x)
[Out] int(f^(1/(b*x+a)^2*c)/x,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{(bx+a)^2}}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^2)/x,x, algorithm="maxima")
[Out] integrate(f^(c/(b*x + a)^2)/x, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.06

$$\int \frac{f^{\frac{c}{(a+b\,x)^2}}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x)^2)/x,x)
```

```
[Out] int(f^(c/(a + b*x)^2)/x, x)
```

sympy **[A]** time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{(a+bx)^2}}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a)**2)/x,x)
```

```
[Out] Integral(f**(c/(a + b*x)**2)/x, x)
```

3.230 $\int \frac{f^{\frac{c}{(a+bx)^2}}}{x^2} dx$

Optimal. Leaf size=18

$$\text{Int}\left(\frac{f^{\frac{c}{(a+bx)^2}}}{x^2}, x\right)$$

[Out] CannotIntegrate(f^(c/(b*x+a)^2)/x^2,x)

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{f^{\frac{c}{(a+bx)^2}}}{x^2} dx$$

Verification is Not applicable to the result.

[In] Int[f^(c/(a + b*x)^2)/x^2,x]

[Out] Defer[Int][f^(c/(a + b*x)^2)/x^2, x]

Rubi steps

$$\int \frac{f^{\frac{c}{(a+bx)^2}}}{x^2} dx = \int \frac{f^{\frac{c}{(a+bx)^2}}}{x^2} dx$$

Mathematica [A] time = 0.23, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{(a+bx)^2}}}{x^2} dx$$

Verification is Not applicable to the result.

[In] Integrate[f^(c/(a + b*x)^2)/x^2,x]

[Out] Integrate[f^(c/(a + b*x)^2)/x^2, x]

fricas [A] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{f^{\frac{c}{b^2x^2+2\,abx+a^2}}}{x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^2)/x^2,x, algorithm="fricas")
[Out] integral(f^(c/(b^2*x^2 + 2*a*b*x + a^2))/x^2, x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{(bx+a)^2}}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^2)/x^2,x, algorithm="giac")
[Out] integrate(f^(c/(b*x + a)^2)/x^2, x)
```

maple [A] time = 0.08, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{(bx+a)^2}}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(1/(b*x+a)^2*c)/x^2,x)
[Out] int(f^(1/(b*x+a)^2*c)/x^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{(bx+a)^2}}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^2)/x^2,x, algorithm="maxima")
[Out] integrate(f^(c/(b*x + a)^2)/x^2, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.06

$$\int \frac{f^{\frac{c}{(a+b\,x)^2}}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x)^2)/x^2,x)
```

```
[Out] int(f^(c/(a + b*x)^2)/x^2, x)
```

sympy **[A]** time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{(a+bx)^2}}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a)**2)/x**2,x)
```

```
[Out] Integral(f**(c/(a + b*x)**2)/x**2, x)
```

3.231 $\int \frac{f^{\frac{c}{(a+bx)^2}}}{x^3} dx$

Optimal. Leaf size=18

$$\text{Int}\left(\frac{f^{\frac{c}{(a+bx)^2}}}{x^3}, x\right)$$

[Out] CannotIntegrate(f^(c/(b*x+a)^2)/x^3,x)

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{f^{\frac{c}{(a+bx)^2}}}{x^3} dx$$

Verification is Not applicable to the result.

[In] Int[f^(c/(a + b*x)^2)/x^3,x]

[Out] Defer[Int][f^(c/(a + b*x)^2)/x^3, x]

Rubi steps

$$\int \frac{f^{\frac{c}{(a+bx)^2}}}{x^3} dx = \int \frac{f^{\frac{c}{(a+bx)^2}}}{x^3} dx$$

Mathematica [A] time = 0.29, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{(a+bx)^2}}}{x^3} dx$$

Verification is Not applicable to the result.

[In] Integrate[f^(c/(a + b*x)^2)/x^3,x]

[Out] Integrate[f^(c/(a + b*x)^2)/x^3, x]

fricas [A] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{f^{\frac{c}{b^2x^2+2\,abx+a^2}}}{x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^2)/x^3,x, algorithm="fricas")
[Out] integral(f^(c/(b^2*x^2 + 2*a*b*x + a^2))/x^3, x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{(bx+a)^2}}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^2)/x^3,x, algorithm="giac")
[Out] integrate(f^(c/(b*x + a)^2)/x^3, x)
```

maple [A] time = 0.10, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{(bx+a)^2}}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(1/(b*x+a)^2*c)/x^3,x)
[Out] int(f^(1/(b*x+a)^2*c)/x^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{(bx+a)^2}}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^2)/x^3,x, algorithm="maxima")
[Out] integrate(f^(c/(b*x + a)^2)/x^3, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.06

$$\int \frac{f^{\frac{c}{(a+b\,x)^2}}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x)^2)/x^3,x)
```

```
[Out] int(f^(c/(a + b*x)^2)/x^3, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{(a+bx)^2}}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a)**2)/x**3,x)
```

```
[Out] Integral(f**(c/(a + b*x)**2)/x**3, x)
```

3.232 $\int f^{\frac{c}{(a+bx)^3}} x^4 \, dx$

Optimal. Leaf size=239

$$\frac{a^4(a+bx)\sqrt[3]{-\frac{c\log(f)}{(a+bx)^3}}\,\Gamma\left(-\frac{1}{3},-\frac{c\log(f)}{(a+bx)^3}\right)}{3b^5}-\frac{4a^3(a+bx)^2\left(-\frac{c\log(f)}{(a+bx)^3}\right)^{2/3}\Gamma\left(-\frac{2}{3},-\frac{c\log(f)}{(a+bx)^3}\right)}{3b^5}-\frac{2a^2c\log(f)\text{Ei}\left(\frac{c\log(f)}{(a+bx)^3}\right)}{b^5}+\frac{2a^2(a$$

```
[Out] 2*a^2*f^(c/(b*x+a)^3)*(b*x+a)^3/b^5-2*a^2*c*Ei(c*ln(f)/(b*x+a)^3)*ln(f)/b^5
+1/3*a^4*(b*x+a)*GAMMA(-1/3,-c*ln(f)/(b*x+a)^3)*(-c*ln(f)/(b*x+a)^3)^(1/3)/
b^5-4/3*a^3*(b*x+a)^2*GAMMA(-2/3,-c*ln(f)/(b*x+a)^3)*(-c*ln(f)/(b*x+a)^3)^(
2/3)/b^5-4/3*a*(b*x+a)^4*GAMMA(-4/3,-c*ln(f)/(b*x+a)^3)*(-c*ln(f)/(b*x+a)^3
)^(4/3)/b^5+1/3*(b*x+a)^5*GAMMA(-5/3,-c*ln(f)/(b*x+a)^3)*(-c*ln(f)/(b*x+a)^
3)^(5/3)/b^5
```

Rubi [A] time = 0.20, antiderivative size = 239, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {2226, 2208, 2218, 2214, 2210}

$$-\frac{4a^3(a+bx)^2\left(-\frac{c\log(f)}{(a+bx)^3}\right)^{2/3}\text{Gamma}\left(-\frac{2}{3},-\frac{c\log(f)}{(a+bx)^3}\right)}{3b^5}+\frac{a^4(a+bx)\sqrt[3]{-\frac{c\log(f)}{(a+bx)^3}}\,\text{Gamma}\left(-\frac{1}{3},-\frac{c\log(f)}{(a+bx)^3}\right)}{3b^5}+\frac{(a+bx)^5\left(-\frac{c}{(a}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c/(a + b*x)^3)*x^4,x]
```

```
[Out] (2*a^2*f^(c/(a + b*x)^3)*(a + b*x)^3)/b^5 - (2*a^2*c*ExpIntegralEi[(c*Log[f
])/(a + b*x)^3]*Log[f])/b^5 + (a^4*(a + b*x)*Gamma[-1/3, -((c*Log[f])/(a +
b*x)^3)]*(-((c*Log[f])/(a + b*x)^3))^(1/3))/(3*b^5) - (4*a^3*(a + b*x)^2*Ga
mma[-2/3, -((c*Log[f])/(a + b*x)^3)]*(-((c*Log[f])/(a + b*x)^3))^(2/3))/(3*
b^5) - (4*a*(a + b*x)^4*Gamma[-4/3, -((c*Log[f])/(a + b*x)^3)]*(-((c*Log[f]
)/(a + b*x)^3))^(4/3))/(3*b^5) + ((a + b*x)^5*Gamma[-5/3, -((c*Log[f])/(a +
 b*x)^3)]*(-((c*Log[f])/(a + b*x)^3))^(5/3))/(3*b^5)
```

Rule 2208

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> -Simp[(F^a
*(c + d*x)*Gamma[1/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x)^n*Log[F
]))^(1/n)), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
```

```
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2226

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int f^{\frac{c}{(a+bx)^3}} x^4\,dx = \int \left(\frac{a^4 f^{\frac{c}{(a+bx)^3}}}{b^4} - \frac{4a^3 f^{\frac{c}{(a+bx)^3}}(a+bx)}{b^4} + \frac{6a^2 f^{\frac{c}{(a+bx)^3}}(a+bx)^2}{b^4} - \frac{4a f^{\frac{c}{(a+bx)^3}}(a+bx)^3}{b^4} + \frac{f^{\frac{c}{(a+bx)^3}}(a+\right.$$

$$= \frac{\int f^{\frac{c}{(a+bx)^3}}(a+bx)^4\,dx}{b^4} - \frac{(4a)\int f^{\frac{c}{(a+bx)^3}}(a+bx)^3\,dx}{b^4} + \frac{\left(6a^2\right)\int f^{\frac{c}{(a+bx)^3}}(a+bx)^2\,dx}{b^4} - \frac{\left(4a^3\right)\int f}{}$$

$$= \frac{2a^2 f^{\frac{c}{(a+bx)^3}}(a+bx)^3}{b^5} + \frac{a^4(a+bx)\Gamma\left(-\frac{1}{3}, -\frac{c\log(f)}{(a+bx)^3}\right)\sqrt[3]{-\frac{c\log(f)}{(a+bx)^3}}}{3b^5} - \frac{4a^3(a+bx)^2\Gamma\left(-\frac{2}{3}, -\frac{c\log(f)}{(a+bx)^3}\right)\Big(}{3b^5}$$

$$= \frac{2a^2 f^{\frac{c}{(a+bx)^3}}(a+bx)^3}{b^5} - \frac{2a^2 c\,\mathrm{Ei}\left(\frac{c\log(f)}{(a+bx)^3}\right)\log(f)}{b^5} + \frac{a^4(a+bx)\Gamma\left(-\frac{1}{3}, -\frac{c\log(f)}{(a+bx)^3}\right)\sqrt[3]{-\frac{c\log(f)}{(a+bx)^3}}}{3b^5} - \frac{4a^3(}{}$$

Mathematica [A] time = 0.19, size = 219, normalized size = 0.92

$$\frac{a^4(a+bx)\sqrt[3]{-\frac{c\log(f)}{(a+bx)^3}}\,\Gamma\left(-\frac{1}{3},-\frac{c\log(f)}{(a+bx)^3}\right)-4a^3(a+bx)^2\left(-\frac{c\log(f)}{(a+bx)^3}\right)^{2/3}\Gamma\left(-\frac{2}{3},-\frac{c\log(f)}{(a+bx)^3}\right)-6a^2c\log(f)\text{Ei}\left(\frac{c\log(f)}{(a+bx)^3}\right)+6a^2}{3b^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c/(a + b*x)^3)*x^4,x]
```

```
[Out] (6*a^2*f^(c/(a + b*x)^3)*(a + b*x)^3 - 6*a^2*c*ExpIntegralEi[(c*Log[f])/(a
+ b*x)^3]*Log[f] + a^4*(a + b*x)*Gamma[-1/3, -((c*Log[f])/(a + b*x)^3)]*(-(
(c*Log[f])/(a + b*x)^3))^(1/3) + 4*a*c*(a + b*x)*Gamma[-4/3, -((c*Log[f])/(
a + b*x)^3)]*Log[f]*(-((c*Log[f])/(a + b*x)^3))^(1/3) - 4*a^3*(a + b*x)^2*G
amma[-2/3, -((c*Log[f])/(a + b*x)^3)]*(-((c*Log[f])/(a + b*x)^3))^(2/3) + (
a + b*x)^5*Gamma[-5/3, -((c*Log[f])/(a + b*x)^3)]*(-((c*Log[f])/(a + b*x)^3
))^(5/3))/(3*b^5)
```

fricas [A] time = 0.43, size = 248, normalized size = 1.04

$$-\frac{20\,a^2c\text{Ei}\left(\frac{c\log(f)}{b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3}\right)\log(f)-\left(20\,a^3b^2-3\,b^2c\log(f)\right)\left(-\frac{c\log(f)}{b^3}\right)^{\frac{2}{3}}\Gamma\left(\frac{1}{3},-\frac{c\log(f)}{b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3}\right)+10\,(a}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3)*x^4,x, algorithm="fricas")
```

```
[Out] -1/10*(20*a^2*c*Ei(c*log(f)/(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3))*log(
f) - (20*a^3*b^2 - 3*b^2*c*log(f))*(-c*log(f)/b^3)^(2/3)*gamma(1/3, -c*log(
f)/(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3)) + 10*(a^4*b - 3*a*b*c*log(f))
*(-c*log(f)/b^3)^(1/3)*gamma(2/3, -c*log(f)/(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*
b*x + a^3)) - (2*b^5*x^5 + 2*a^5 + 3*(b^2*c*x^2 - 8*a*b*c*x - 9*a^2*c)*log(
f))*f^(c/(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3)))/b^5
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{(bx+a)^3}}x^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3)*x^4,x, algorithm="giac")
```

```
[Out] integrate(f^(c/(b*x + a)^3)*x^4, x)
```

maple [F] time = 0.08, size = 0, normalized size = 0.00

$$\int x^{4} f^{\frac{c}{(bx+a)^{3}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(b*x+a)^3)*x^4,x)
```

```
[Out] int(f^(c/(b*x+a)^3)*x^4,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\left(2\,b^{4}x^{5} + 3\,bcx^{2}\log(f) - 24\,acx\log(f)\right)f^{\frac{c}{b^{3}x^{3}+3\,ab^{2}x^{2}+3\,a^{2}bx+a^{3}}}}{10\,b^{4}} + \int \frac{3\left(20\,a^{2}b^{3}cx^{3}\log(f) + 8\,a^{5}c\log(f) + \left(40\,a^{3}b^{2}c\right.\right.}{10\left(b^{8}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3)*x^4,x, algorithm="maxima")
```

```
[Out] 1/10*(2*b^4*x^5 + 3*b*c*x^2*log(f) - 24*a*c*x*log(f))*f^(c/(b^3*x^3 + 3*a*b
^2*x^2 + 3*a^2*b*x + a^3))/b^4 + integrate(3/10*(20*a^2*b^3*c*x^3*log(f) +
8*a^5*c*log(f) + (40*a^3*b^2*c*log(f) + 3*b^2*c^2*log(f)^2)*x^2 + 6*(5*a^4*
b*c*log(f) - 4*a*b*c^2*log(f)^2)*x)*f^(c/(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x
 + a^3))/(b^8*x^4 + 4*a*b^7*x^3 + 6*a^2*b^6*x^2 + 4*a^3*b^5*x + a^4*b^4), x
)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int f^{\frac{c}{(a+b\,x)^{3}}}\, x^{4}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x)^3)*x^4,x)
```

```
[Out] int(f^(c/(a + b*x)^3)*x^4, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{(a+bx)^{3}}} x^{4}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a)**3)*x**4,x)
```

```
[Out] Integral(f**(c/(a + b*x)**3)*x**4, x)
```

3.233 $\int f^{\frac{c}{(a+bx)^3}}x^3\,dx$

Optimal. Leaf size=184

$$-\frac{a^3(a+bx)\sqrt[3]{-\frac{c\log(f)}{(a+bx)^3}}\,\Gamma\left(-\frac{1}{3},-\frac{c\log(f)}{(a+bx)^3}\right)}{3b^4}+\frac{a^2(a+bx)^2\left(-\frac{c\log(f)}{(a+bx)^3}\right)^{2/3}\Gamma\left(-\frac{2}{3},-\frac{c\log(f)}{(a+bx)^3}\right)}{b^4}+\frac{ac\log(f)\mathrm{Ei}\left(\frac{c\log(f)}{(a+bx)^3}\right)}{b^4}-\frac{a(a+b}{}$$

```
[Out] -a*f^(c/(b*x+a)^3)*(b*x+a)^3/b^4+a*c*Ei(c*ln(f)/(b*x+a)^3)*ln(f)/b^4-1/3*a^
3*(b*x+a)*GAMMA(-1/3,-c*ln(f)/(b*x+a)^3)*(-c*ln(f)/(b*x+a)^3)^(1/3)/b^4+a^2
*(b*x+a)^2*GAMMA(-2/3,-c*ln(f)/(b*x+a)^3)*(-c*ln(f)/(b*x+a)^3)^(2/3)/b^4+1/
3*(b*x+a)^4*GAMMA(-4/3,-c*ln(f)/(b*x+a)^3)*(-c*ln(f)/(b*x+a)^3)^(4/3)/b^4
```

Rubi [A] time = 0.15, antiderivative size = 184, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {2226, 2208, 2218, 2214, 2210}

$$\frac{a^2(a+bx)^2\left(-\frac{c\log(f)}{(a+bx)^3}\right)^{2/3}\text{Gamma}\left(-\frac{2}{3},-\frac{c\log(f)}{(a+bx)^3}\right)}{b^4}-\frac{a^3(a+bx)\sqrt[3]{-\frac{c\log(f)}{(a+bx)^3}}\,\text{Gamma}\left(-\frac{1}{3},-\frac{c\log(f)}{(a+bx)^3}\right)}{3b^4}+\frac{(a+bx)^4\left(-\frac{c\log(}{(a+bx}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c/(a + b*x)^3)*x^3,x]
```

```
[Out] -((a*f^(c/(a + b*x)^3)*(a + b*x)^3)/b^4) + (a*c*ExpIntegralEi[(c*Log[f])/(a
 + b*x)^3]*Log[f])/b^4 - (a^3*(a + b*x)*Gamma[-1/3, -((c*Log[f])/(a + b*x)^
3)]*(-((c*Log[f])/(a + b*x)^3))^(1/3))/(3*b^4) + (a^2*(a + b*x)^2*Gamma[-2/
3, -((c*Log[f])/(a + b*x)^3)]*(-((c*Log[f])/(a + b*x)^3))^(2/3))/b^4 + ((a
+ b*x)^4*Gamma[-4/3, -((c*Log[f])/(a + b*x)^3)]*(-((c*Log[f])/(a + b*x)^3))
^(4/3))/(3*b^4)
```

Rule 2208

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> -Simp[(F^a
*(c + d*x)*Gamma[1/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x)^n*Log[F
]))^(1/n)), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2226

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int f^{\frac{c}{(a+bx)^3}} x^3\,dx = \int \left(-\frac{a^3 f^{\frac{c}{(a+bx)^3}}}{b^3} + \frac{3a^2 f^{\frac{c}{(a+bx)^3}}(a+bx)}{b^3} - \frac{3a f^{\frac{c}{(a+bx)^3}}(a+bx)^2}{b^3} + \frac{f^{\frac{c}{(a+bx)^3}}(a+bx)^3}{b^3}\right) dx$$

$$= \frac{\int f^{\frac{c}{(a+bx)^3}}(a+bx)^3\,dx}{b^3} - \frac{(3a)\int f^{\frac{c}{(a+bx)^3}}(a+bx)^2\,dx}{b^3} + \frac{\left(3a^2\right)\int f^{\frac{c}{(a+bx)^3}}(a+bx)\,dx}{b^3} - \frac{a^3 \int f^{\frac{c}{(a+bx)^{\cdot}}}}{b^3}$$

$$= -\frac{a f^{\frac{c}{(a+bx)^3}}(a+bx)^3}{b^4} - \frac{a^3(a+bx)\Gamma\left(-\frac{1}{3},-\frac{c\log(f)}{(a+bx)^3}\right)\sqrt[3]{-\frac{c\log(f)}{(a+bx)^3}}}{3b^4} + \frac{a^2(a+bx)^2\Gamma\left(-\frac{2}{3},-\frac{c\log(f)}{(a+bx)^3}\right)\left(-\frac{c}{(}\right.}{b^4}$$

$$= -\frac{a f^{\frac{c}{(a+bx)^3}}(a+bx)^3}{b^4} + \frac{ac\mathrm{Ei}\left(\frac{c\log(f)}{(a+bx)^3}\right)\log(f)}{b^4} - \frac{a^3(a+bx)\Gamma\left(-\frac{1}{3},-\frac{c\log(f)}{(a+bx)^3}\right)\sqrt[3]{-\frac{c\log(f)}{(a+bx)^3}}}{3b^4} + \frac{a^2(a+}{}$$

Mathematica [A] time = 0.37, size = 167, normalized size = 0.91

$$\frac{3ac\log(f)\mathrm{Ei}\left(\frac{c\log(f)}{(a+bx)^3}\right) - (a+bx)\left(a^3\sqrt[3]{-\frac{c\log(f)}{(a+bx)^3}}\,\Gamma\left(-\frac{1}{3},-\frac{c\log(f)}{(a+bx)^3}\right) + 3a(a+bx)\left((a+bx)f^{\frac{c}{(a+bx)^3}} - a\left(-\frac{c\log(f)}{(a+bx)^3}\right)^{2/3}\Gamma\right.\right.}{3b^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c/(a + b*x)^3)*x^3,x]
```

```
[Out] (3*a*c*ExpIntegralEi[(c*Log[f])/(a + b*x)^3]*Log[f] - (a + b*x)*(a^3*Gamma[
-1/3, -((c*Log[f])/(a + b*x)^3)]*(-((c*Log[f])/(a + b*x)^3))^(1/3) + c*Gamm
a[-4/3, -((c*Log[f])/(a + b*x)^3)]*Log[f]*(-((c*Log[f])/(a + b*x)^3))^(1/3)
 + 3*a*(a + b*x)*(f^(c/(a + b*x)^3)*(a + b*x) - a*Gamma[-2/3, -((c*Log[f])/
(a + b*x)^3)]*(-((c*Log[f])/(a + b*x)^3))^(2/3))))/(3*b^4)
```

fricas [A] time = 0.45, size = 221, normalized size = 1.20

$$-\frac{6\,a^2b^2\left(-\frac{c\log(f)}{b^3}\right)^{\frac{2}{3}}\Gamma\left(\frac{1}{3},-\frac{c\log(f)}{b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3}\right)-4\,ac\mathrm{Ei}\left(\frac{c\log(f)}{b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3}\right)\log(f)-\left(4\,a^3b-3\,bc\log(f)\right)\left(-\frac{c\,l}{}\right.}{4\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3)*x^3,x, algorithm="fricas")
```

```
[Out] -1/4*(6*a^2*b^2*(-c*log(f)/b^3)^(2/3)*gamma(1/3, -c*log(f)/(b^3*x^3 + 3*a*b
^2*x^2 + 3*a^2*b*x + a^3)) - 4*a*c*Ei(c*log(f)/(b^3*x^3 + 3*a*b^2*x^2 + 3*a
^2*b*x + a^3))*log(f) - (4*a^3*b - 3*b*c*log(f))*(-c*log(f)/b^3)^(1/3)*gamm
a(2/3, -c*log(f)/(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3)) - (b^4*x^4 - a^
4 + 3*(b*c*x + a*c)*log(f))*f^(c/(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3))
)/b^4
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{(bx+a)^3}}x^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3)*x^3,x, algorithm="giac")
```

```
[Out] integrate(f^(c/(b*x + a)^3)*x^3, x)
```

maple [F] time = 0.07, size = 0, normalized size = 0.00

$$\int x^3 f^{\frac{c}{(bx+a)^3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(1/(b*x+a)^3*c)*x^3,x)
```

```
[Out] int(f^(1/(b*x+a)^3*c)*x^3,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\left(b^3x^4 + 3\,cx\log(f)\right)f^{\frac{c}{b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3}}}{4\,b^3} - \int \frac{3\left(4\,ab^3cx^3\log(f) + 6\,a^2b^2cx^2\log(f) + a^4c\log(f) + \left(4\,a^3bc\log(f)\right.\right.}{4\left(b^7x^4 + 4\,ab^6x^3 + 6\,a^2b^5x^2 + 4\,a^3b^4x\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3)*x^3,x, algorithm="maxima")
```

```
[Out] 1/4*(b^3*x^4 + 3*c*x*log(f))*f^(c/(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3)
)/b^3 - integrate(3/4*(4*a*b^3*c*x^3*log(f) + 6*a^2*b^2*c*x^2*log(f) + a^4*
c*log(f) + (4*a^3*b*c*log(f) - 3*b*c^2*log(f)^2)*x)*f^(c/(b^3*x^3 + 3*a*b^2
*x^2 + 3*a^2*b*x + a^3))/(b^7*x^4 + 4*a*b^6*x^3 + 6*a^2*b^5*x^2 + 4*a^3*b^4
*x + a^4*b^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int f^{\frac{c}{(a+b\,x)^3}}\,x^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x)^3)*x^3,x)
```

```
[Out] int(f^(c/(a + b*x)^3)*x^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{(a+bx)^3}}x^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a)**3)*x**3,x)
```

```
[Out] Integral(f**(c/(a + b*x)**3)*x**3, x)
```

3.234 $\int f^{\frac{c}{(a+bx)^3}} x^2 \, dx$

Optimal. Leaf size=142

$$\frac{a^2(a+bx)\sqrt[3]{-\frac{c\log(f)}{(a+bx)^3}}\,\Gamma\left(-\frac{1}{3},-\frac{c\log(f)}{(a+bx)^3}\right)}{3b^3}-\frac{c\log(f)\mathrm{Ei}\left(\frac{c\log(f)}{(a+bx)^3}\right)}{3b^3}+\frac{(a+bx)^3 f^{\frac{c}{(a+bx)^3}}}{3b^3}-\frac{2a(a+bx)^2\left(-\frac{c\log(f)}{(a+bx)^3}\right)^{2/3}\Gamma\left(-\frac{2}{3},-\frac{c}{(}\right.}{3b^3}$$

```
[Out] 1/3*f^(c/(b*x+a)^3)*(b*x+a)^3/b^3-1/3*c*Ei(c*ln(f)/(b*x+a)^3)*ln(f)/b^3+1/3
*a^2*(b*x+a)*GAMMA(-1/3,-c*ln(f)/(b*x+a)^3)*(-c*ln(f)/(b*x+a)^3)^(1/3)/b^3-
2/3*a*(b*x+a)^2*GAMMA(-2/3,-c*ln(f)/(b*x+a)^3)*(-c*ln(f)/(b*x+a)^3)^(2/3)/b
^3
```

Rubi [A] time = 0.12, antiderivative size = 142, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {2226, 2208, 2218, 2214, 2210}

$$\frac{a^2(a+bx)\sqrt[3]{-\frac{c\log(f)}{(a+bx)^3}}\,\mathrm{Gamma}\left(-\frac{1}{3},-\frac{c\log(f)}{(a+bx)^3}\right)}{3b^3}-\frac{2a(a+bx)^2\left(-\frac{c\log(f)}{(a+bx)^3}\right)^{2/3}\mathrm{Gamma}\left(-\frac{2}{3},-\frac{c\log(f)}{(a+bx)^3}\right)}{3b^3}-\frac{c\log(f)\mathrm{Ei}\left(\frac{c\log(}{(a+bx}\right.}{3b^3}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c/(a + b*x)^3)*x^2,x]
```

```
[Out] (f^(c/(a + b*x)^3)*(a + b*x)^3)/(3*b^3) - (c*ExpIntegralEi[(c*Log[f])/(a +
b*x)^3]*Log[f])/(3*b^3) + (a^2*(a + b*x)*Gamma[-1/3, -((c*Log[f])/(a + b*x)
^3)]*(-((c*Log[f])/(a + b*x)^3))^(1/3))/(3*b^3) - (2*a*(a + b*x)^2*Gamma[-2
/3, -((c*Log[f])/(a + b*x)^3)]*(-((c*Log[f])/(a + b*x)^3))^(2/3))/(3*b^3)
```

Rule 2208

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> -Simp[(F^a
*(c + d*x)*Gamma[1/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x)^n*Log[F
]))^(1/n)), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
```

```
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2226

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int f^{\frac{c}{(a+bx)^3}}x^2\,dx = \int\left(\frac{a^2f^{\frac{c}{(a+bx)^3}}}{b^2}-\frac{2af^{\frac{c}{(a+bx)^3}}(a+bx)}{b^2}+\frac{f^{\frac{c}{(a+bx)^3}}(a+bx)^2}{b^2}\right)dx$$

$$=\frac{\int f^{\frac{c}{(a+bx)^3}}(a+bx)^2\,dx}{b^2}-\frac{(2a)\int f^{\frac{c}{(a+bx)^3}}(a+bx)\,dx}{b^2}+\frac{a^2\int f^{\frac{c}{(a+bx)^3}}\,dx}{b^2}$$

$$=\frac{f^{\frac{c}{(a+bx)^3}}(a+bx)^3}{3b^3}+\frac{a^2(a+bx)\Gamma\left(-\frac{1}{3},-\frac{c\log(f)}{(a+bx)^3}\right)\sqrt[3]{-\frac{c\log(f)}{(a+bx)^3}}}{3b^3}-\frac{2a(a+bx)^2\Gamma\left(-\frac{2}{3},-\frac{c\log(f)}{(a+bx)^3}\right)\left(-\frac{c\log(f)}{(a+bx)^3}\right.}{3b^3}$$

$$=\frac{f^{\frac{c}{(a+bx)^3}}(a+bx)^3}{3b^3}-\frac{c\,\text{Ei}\left(\frac{c\log(f)}{(a+bx)^3}\right)\log(f)}{3b^3}+\frac{a^2(a+bx)\Gamma\left(-\frac{1}{3},-\frac{c\log(f)}{(a+bx)^3}\right)\sqrt[3]{-\frac{c\log(f)}{(a+bx)^3}}}{3b^3}-\frac{2a(a+bx)^2}{}$$

Mathematica [A] time = 0.07, size = 127, normalized size = 0.89

$$\frac{a^2(a+bx)\sqrt[3]{-\frac{c\log(f)}{(a+bx)^3}}\,\Gamma\left(-\frac{1}{3},-\frac{c\log(f)}{(a+bx)^3}\right)-c\log(f)\text{Ei}\left(\frac{c\log(f)}{(a+bx)^3}\right)+(a+bx)^3f^{\frac{c}{(a+bx)^3}}-2a(a+bx)^2\left(-\frac{c\log(f)}{(a+bx)^3}\right)^{2/3}\Gamma\left(-\frac{2}{3},\right.}{3b^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c/(a + b*x)^3)*x^2,x]
```

```
[Out] (f^(c/(a + b*x)^3)*(a + b*x)^3 - c*ExpIntegralEi[(c*Log[f])/(a + b*x)^3]*Lo
g[f] + a^2*(a + b*x)*Gamma[-1/3, -((c*Log[f])/(a + b*x)^3)]*(-((c*Log[f])/(
a + b*x)^3))^(1/3) - 2*a*(a + b*x)^2*Gamma[-2/3, -((c*Log[f])/(a + b*x)^3)]
*(-((c*Log[f])/(a + b*x)^3))^(2/3))/(3*b^3)
```

fricas [A] time = 0.47, size = 194, normalized size = 1.37

$$\frac{3\,ab^2\left(-\frac{c\log(f)}{b^3}\right)^{\frac{2}{3}}\Gamma\left(\frac{1}{3}, -\frac{c\log(f)}{b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3}\right) - 3\,a^2b\left(-\frac{c\log(f)}{b^3}\right)^{\frac{1}{3}}\Gamma\left(\frac{2}{3}, -\frac{c\log(f)}{b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3}\right) - c\mathrm{Ei}\left(\frac{c\log(f)}{b^3x^3+3\,ab^2x^2+3\,a}\right.}{3\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3)*x^2,x, algorithm="fricas")
```

```
[Out] 1/3*(3*a*b^2*(-c*log(f)/b^3)^(2/3)*gamma(1/3, -c*log(f)/(b^3*x^3 + 3*a*b^2*
x^2 + 3*a^2*b*x + a^3)) - 3*a^2*b*(-c*log(f)/b^3)^(1/3)*gamma(2/3, -c*log(f
)/(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3)) - c*Ei(c*log(f)/(b^3*x^3 + 3*a
*b^2*x^2 + 3*a^2*b*x + a^3))*log(f) + (b^3*x^3 + a^3)*f^(c/(b^3*x^3 + 3*a*b
^2*x^2 + 3*a^2*b*x + a^3)))/b^3
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{(bx+a)^3}} x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3)*x^2,x, algorithm="giac")
```

```
[Out] integrate(f^(c/(b*x + a)^3)*x^2, x)
```

maple [F] time = 0.07, size = 0, normalized size = 0.00

$$\int x^2 f^{\frac{c}{(bx+a)^3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(1/(b*x+a)^3*c)*x^2,x)
```

```
[Out] int(f^(1/(b*x+a)^3*c)*x^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{3} f^{\frac{c}{b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3}} x^3 + bc\int \frac{f^{\frac{c}{b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3}} x^3}{b^4x^4 + 4\,ab^3x^3 + 6\,a^2b^2x^2 + 4\,a^3bx + a^4}\,dx\log(f)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3)*x^2,x, algorithm="maxima")
```

```
[Out] 1/3*f^(c/(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3))*x^3 + b*c*integrate(f^(
c/(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3))*x^3/(b^4*x^4 + 4*a*b^3*x^3 + 6
*a^2*b^2*x^2 + 4*a^3*b*x + a^4), x)*log(f)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int f^{\frac{c}{(a+b\,x)^3}}\,x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x)^3)*x^2,x)
```

```
[Out] int(f^(c/(a + b*x)^3)*x^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{(a+bx)^3}}x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a)**3)*x**2,x)
```

```
[Out] Integral(f**(c/(a + b*x)**3)*x**2, x)
```

3.235 $\int f^{\frac{c}{(a+bx)^3}} x\,dx$

Optimal. Leaf size=92

$$\frac{(a+bx)^2\left(-\frac{c\log(f)}{(a+bx)^3}\right)^{2/3}\Gamma\left(-\frac{2}{3},-\frac{c\log(f)}{(a+bx)^3}\right)}{3b^2}-\frac{a(a+bx)\sqrt[3]{-\frac{c\log(f)}{(a+bx)^3}}\,\Gamma\left(-\frac{1}{3},-\frac{c\log(f)}{(a+bx)^3}\right)}{3b^2}$$

```
[Out] -1/3*a*(b*x+a)*GAMMA(-1/3,-c*ln(f)/(b*x+a)^3)*(-c*ln(f)/(b*x+a)^3)^(1/3)/b^
2+1/3*(b*x+a)^2*GAMMA(-2/3,-c*ln(f)/(b*x+a)^3)*(-c*ln(f)/(b*x+a)^3)^(2/3)/b
^2
```

Rubi [A] time = 0.05, antiderivative size = 92, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231, Rules used = {2226, 2208, 2218}

$$\frac{(a+bx)^2\left(-\frac{c\log(f)}{(a+bx)^3}\right)^{2/3}\text{Gamma}\left(-\frac{2}{3},-\frac{c\log(f)}{(a+bx)^3}\right)}{3b^2}-\frac{a(a+bx)\sqrt[3]{-\frac{c\log(f)}{(a+bx)^3}}\,\text{Gamma}\left(-\frac{1}{3},-\frac{c\log(f)}{(a+bx)^3}\right)}{3b^2}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c/(a + b*x)^3)*x,x]
```

```
[Out] -(a*(a + b*x)*Gamma[-1/3, -((c*Log[f])/(a + b*x)^3)]*(-((c*Log[f])/(a + b*x
)^3))^(1/3))/(3*b^2) + ((a + b*x)^2*Gamma[-2/3, -((c*Log[f])/(a + b*x)^3)]*
(-((c*Log[f])/(a + b*x)^3))^(2/3))/(3*b^2)
```

Rule 2208

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> -Simp[(F^a
*(c + d*x)*Gamma[1/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x)^n*Log[F
]))^(1/n)), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2226

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
```

```
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\begin{aligned}\int f^{\frac{c}{(a+bx)^3}} x\,dx &= \int \left(-\frac{a f^{\frac{c}{(a+bx)^3}}}{b} + \frac{f^{\frac{c}{(a+bx)^3}}(a+bx)}{b}\right)dx\\ &= \frac{\int f^{\frac{c}{(a+bx)^3}}(a+bx)\,dx}{b} - \frac{a\int f^{\frac{c}{(a+bx)^3}}\,dx}{b}\\ &= -\frac{a(a+bx)\Gamma\left(-\frac{1}{3}, -\frac{c\log(f)}{(a+bx)^3}\right)\sqrt[3]{-\frac{c\log(f)}{(a+bx)^3}}}{3b^2} + \frac{(a+bx)^2\Gamma\left(-\frac{2}{3}, -\frac{c\log(f)}{(a+bx)^3}\right)\left(-\frac{c\log(f)}{(a+bx)^3}\right)^{2/3}}{3b^2}\end{aligned}$$

Mathematica [A] time = 0.07, size = 86, normalized size = 0.93

$$\frac{(a+bx)\left((a+bx)\left(-\frac{c\log(f)}{(a+bx)^3}\right)^{2/3}\Gamma\left(-\frac{2}{3}, -\frac{c\log(f)}{(a+bx)^3}\right) - a\sqrt[3]{-\frac{c\log(f)}{(a+bx)^3}}\,\Gamma\left(-\frac{1}{3}, -\frac{c\log(f)}{(a+bx)^3}\right)\right)}{3b^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c/(a + b*x)^3)*x,x]
```

```
[Out] ((a + b*x)*(-(a*Gamma[-1/3, -((c*Log[f])/(a + b*x)^3)]*(-((c*Log[f])/(a + b
*x)^3))^(1/3)) + (a + b*x)*Gamma[-2/3, -((c*Log[f])/(a + b*x)^3)]*(-((c*Log
[f])/(a + b*x)^3))^(2/3)))/(3*b^2)
```

fricas [A] time = 0.44, size = 154, normalized size = 1.67

$$-\frac{b^2\left(-\frac{c\log(f)}{b^3}\right)^{\frac{2}{3}}\Gamma\left(\frac{1}{3}, -\frac{c\log(f)}{b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3}\right) - 2\,ab\left(-\frac{c\log(f)}{b^3}\right)^{\frac{1}{3}}\Gamma\left(\frac{2}{3}, -\frac{c\log(f)}{b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3}\right) - \left(b^2x^2-a^2\right)f^{\frac{c}{b^3x^3+3\,ab}}}{2\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3)*x,x, algorithm="fricas")
```

```
[Out] -1/2*(b^2*(-c*log(f)/b^3)^(2/3)*gamma(1/3, -c*log(f)/(b^3*x^3 + 3*a*b^2*x^2
 + 3*a^2*b*x + a^3)) - 2*a*b*(-c*log(f)/b^3)^(1/3)*gamma(2/3, -c*log(f)/(b^
3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3)) - (b^2*x^2 - a^2)*f^(c/(b^3*x^3 + 3
*a*b^2*x^2 + 3*a^2*b*x + a^3)))/b^2
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{(bx+a)^3}} x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3)*x,x, algorithm="giac")
```

```
[Out] integrate(f^(c/(b*x + a)^3)*x, x)
```

maple [F] time = 0.06, size = 0, normalized size = 0.00

$$\int x f^{\frac{c}{(bx+a)^3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(1/(b*x+a)^3*c)*x,x)
```

```
[Out] int(f^(1/(b*x+a)^3*c)*x,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$3\,bc\int \frac{f^{\frac{c}{b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3}}x^2}{2\left(b^4x^4+4\,ab^3x^3+6\,a^2b^2x^2+4\,a^3bx+a^4\right)}\,dx\log(f)+\frac{1}{2}\,f^{\frac{c}{b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3}}x^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3)*x,x, algorithm="maxima")
```

```
[Out] 3*b*c*integrate(1/2*f^(c/(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3))*x^2/(b^
4*x^4 + 4*a*b^3*x^3 + 6*a^2*b^2*x^2 + 4*a^3*b*x + a^4), x)*log(f) + 1/2*f^(
c/(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3))*x^2
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int f^{\frac{c}{(a+b\,x)^3}}\,x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x)^3)*x,x)
```

```
[Out] int(f^(c/(a + b*x)^3)*x, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{(a+bx)^3}} x \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a)**3)*x,x)
```

```
[Out] Integral(f**(c/(a + b*x)**3)*x, x)
```

3.236 $\int f^{\frac{c}{(a+bx)^3}}\,dx$

Optimal. Leaf size=44

$$\frac{(a+bx)\sqrt[3]{-\frac{c\log(f)}{(a+bx)^3}}\,\Gamma\left(-\frac{1}{3},-\frac{c\log(f)}{(a+bx)^3}\right)}{3b}$$

```
[Out] 1/3*(b*x+a)*GAMMA(-1/3,-c*ln(f)/(b*x+a)^3)*(-c*ln(f)/(b*x+a)^3)^(1/3)/b
```

Rubi [A] time = 0.01, antiderivative size = 44, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {2208}

$$\frac{(a+bx)\sqrt[3]{-\frac{c\log(f)}{(a+bx)^3}}\,\text{Gamma}\left(-\frac{1}{3},-\frac{c\log(f)}{(a+bx)^3}\right)}{3b}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c/(a + b*x)^3),x]
```

```
[Out] ((a + b*x)*Gamma[-1/3, -((c*Log[f])/(a + b*x)^3)]*(-((c*Log[f])/(a + b*x)^3
))^(1/3))/(3*b)
```

Rule 2208

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> -Simp[(F^a
*(c + d*x)*Gamma[1/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x)^n*Log[F
]))^(1/n)), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rubi steps

$$\int f^{\frac{c}{(a+bx)^3}}\,dx=\frac{(a+bx)\Gamma\left(-\frac{1}{3},-\frac{c\log(f)}{(a+bx)^3}\right)\sqrt[3]{-\frac{c\log(f)}{(a+bx)^3}}}{3b}$$

Mathematica [A] time = 0.01, size = 44, normalized size = 1.00

$$\frac{(a+bx)\sqrt[3]{-\frac{c\log(f)}{(a+bx)^3}}\,\Gamma\left(-\frac{1}{3},-\frac{c\log(f)}{(a+bx)^3}\right)}{3b}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c/(a + b*x)^3),x]
```

```
[Out] ((a + b*x)*Gamma[-1/3, -((c*Log[f])/(a + b*x)^3)]*(-((c*Log[f])/(a + b*x)^3
))^(1/3))/(3*b)
```

fricas [B] time = 0.49, size = 94, normalized size = 2.14

$$-\frac{b\left(-\frac{c\log(f)}{b^3}\right)^{\frac{1}{3}}\Gamma\left(\frac{2}{3}, -\frac{c\log(f)}{b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3}\right) - (bx+a)f^{\frac{c}{b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3}}}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3),x, algorithm="fricas")
```

```
[Out] -(b*(-c*log(f)/b^3)^(1/3)*gamma(2/3, -c*log(f)/(b^3*x^3 + 3*a*b^2*x^2 + 3*a
^2*b*x + a^3)) - (b*x + a)*f^(c/(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3)))
/b
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{(bx+a)^3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3),x, algorithm="giac")
```

```
[Out] integrate(f^(c/(b*x + a)^3), x)
```

maple [F] time = 0.05, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{(bx+a)^3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(1/(b*x+a)^3*c),x)
```

```
[Out] int(f^(1/(b*x+a)^3*c),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$3\,bc\int\frac{f^{\frac{c}{b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3}}x}{b^4x^4+4\,ab^3x^3+6\,a^2b^2x^2+4\,a^3bx+a^4}\,dx\log(f) + f^{\frac{c}{b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3}}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3),x, algorithm="maxima")
```

```
[Out] 3*b*c*integrate(f^(c/(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3))*x/(b^4*x^4
+ 4*a*b^3*x^3 + 6*a^2*b^2*x^2 + 4*a^3*b*x + a^4), x)*log(f) + f^(c/(b^3*x^3
 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3))*x
```

mupad [B] time = 3.97, size = 68, normalized size = 1.55

$$\frac{(a+b\,x)\left(\Gamma\left(\frac{2}{3}\right)\left(-\frac{c\,\ln(f)}{(a+b\,x)^3}\right)^{1/3}-\Gamma\left(\frac{2}{3},-\frac{c\,\ln(f)}{(a+b\,x)^3}\right)\left(-\frac{c\,\ln(f)}{(a+b\,x)^3}\right)^{1/3}+f^{\frac{c}{(a+b\,x)^3}}\right)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x)^3),x)
```

```
[Out] ((a + b*x)*(gamma(2/3)*(-(c*log(f))/(a + b*x)^3)^(1/3) - igamma(2/3, -(c*lo
g(f))/(a + b*x)^3)*(-(c*log(f))/(a + b*x)^3)^(1/3) + f^(c/(a + b*x)^3)))/b
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{(a+bx)^3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a)**3),x)
```

```
[Out] Integral(f**(c/(a + b*x)**3), x)
```

3.237 $\int \frac{f^{\frac{c}{(a+bx)^3}}}{x} dx$

Optimal. Leaf size=18

$$\operatorname{Int}\left(\frac{f^{\frac{c}{(a+bx)^3}}}{x},x\right)$$

```
[Out] Unintegrable(f^(c/(b*x+a)^3)/x,x)
```

Rubi [A] time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{f^{\frac{c}{(a+bx)^3}}}{x} dx$$

Verification is Not applicable to the result.

```
[In] Int[f^(c/(a + b*x)^3)/x,x]
```

```
[Out] Defer[Int][f^(c/(a + b*x)^3)/x, x]
```

Rubi steps

$$\int \frac{f^{\frac{c}{(a+bx)^3}}}{x} dx = \int \frac{f^{\frac{c}{(a+bx)^3}}}{x} dx$$

Mathematica [A] time = 0.06, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{(a+bx)^3}}}{x} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[f^(c/(a + b*x)^3)/x,x]
```

```
[Out] Integrate[f^(c/(a + b*x)^3)/x, x]
```

fricas [A] time = 0.45, size = 0, normalized size = 0.00

$$\operatorname{integral}\left(\frac{f^{\frac{c}{b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3}}}{x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3)/x,x, algorithm="fricas")
[Out] integral(f^(c/(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3))/x, x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{(bx+a)^3}}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3)/x,x, algorithm="giac")
[Out] integrate(f^(c/(b*x + a)^3)/x, x)
```

maple [A] time = 0.06, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{(bx+a)^3}}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(1/(b*x+a)^3*c)/x,x)
[Out] int(f^(1/(b*x+a)^3*c)/x,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{(bx+a)^3}}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3)/x,x, algorithm="maxima")
[Out] integrate(f^(c/(b*x + a)^3)/x, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.06

$$\int \frac{f^{\frac{c}{(a+b\,x)^3}}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x)^3)/x,x)
```

```
[Out] int(f^(c/(a + b*x)^3)/x, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{(a+bx)^3}}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a)**3)/x,x)
```

```
[Out] Integral(f**(c/(a + b*x)**3)/x, x)
```

3.238 $\int \frac{f^{\frac{c}{(a+bx)^3}}}{x^2} dx$

Optimal. Leaf size=18

$$\text{Int}\left(\frac{f^{\frac{c}{(a+bx)^3}}}{x^2}, x\right)$$

```
[Out] CannotIntegrate(f^(c/(b*x+a)^3)/x^2,x)
```

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{f^{\frac{c}{(a+bx)^3}}}{x^2} dx$$

Verification is Not applicable to the result.

```
[In] Int[f^(c/(a + b*x)^3)/x^2,x]
```

```
[Out] Defer[Int][f^(c/(a + b*x)^3)/x^2, x]
```

Rubi steps

$$\int \frac{f^{\frac{c}{(a+bx)^3}}}{x^2} dx = \int \frac{f^{\frac{c}{(a+bx)^3}}}{x^2} dx$$

Mathematica [A] time = 0.29, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{(a+bx)^3}}}{x^2} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[f^(c/(a + b*x)^3)/x^2,x]
```

```
[Out] Integrate[f^(c/(a + b*x)^3)/x^2, x]
```

fricas [A] time = 0.45, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{f^{\frac{c}{b^3x^3+3ab^2x^2+3a^2bx+a^3}}}{x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3)/x^2,x, algorithm="fricas")
```

```
[Out] integral(f^(c/(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3))/x^2, x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{(bx+a)^3}}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3)/x^2,x, algorithm="giac")
```

```
[Out] integrate(f^(c/(b*x + a)^3)/x^2, x)
```

maple [A] time = 0.07, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{(bx+a)^3}}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(1/(b*x+a)^3*c)/x^2,x)
```

```
[Out] int(f^(1/(b*x+a)^3*c)/x^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{(bx+a)^3}}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3)/x^2,x, algorithm="maxima")
```

```
[Out] integrate(f^(c/(b*x + a)^3)/x^2, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.06

$$\int \frac{f^{\frac{c}{(a+b\,x)^3}}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x)^3)/x^2,x)
```

```
[Out] int(f^(c/(a + b*x)^3)/x^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{(a+bx)^3}}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a)**3)/x**2,x)
```

```
[Out] Integral(f**(c/(a + b*x)**3)/x**2, x)
```

3.239 $\int \frac{f^{\frac{c}{(a+bx)^3}}}{x^3} \, dx$

Optimal. Leaf size=18

$$\text{Int}\left(\frac{f^{\frac{c}{(a+bx)^3}}}{x^3}, x\right)$$

```
[Out] CannotIntegrate(f^(c/(b*x+a)^3)/x^3,x)
```

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{f^{\frac{c}{(a+bx)^3}}}{x^3} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[f^(c/(a + b*x)^3)/x^3,x]
```

```
[Out] Defer[Int][f^(c/(a + b*x)^3)/x^3, x]
```

Rubi steps

$$\int \frac{f^{\frac{c}{(a+bx)^3}}}{x^3} \, dx = \int \frac{f^{\frac{c}{(a+bx)^3}}}{x^3} \, dx$$

Mathematica [A] time = 0.04, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{(a+bx)^3}}}{x^3} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[f^(c/(a + b*x)^3)/x^3,x]
```

```
[Out] Integrate[f^(c/(a + b*x)^3)/x^3, x]
```

fricas [A] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{f^{\frac{c}{b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3}}}{x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3)/x^3,x, algorithm="fricas")
```

```
[Out] integral(f^(c/(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3))/x^3, x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{(bx+a)^3}}}{x^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3)/x^3,x, algorithm="giac")
```

```
[Out] integrate(f^(c/(b*x + a)^3)/x^3, x)
```

maple [A] time = 0.09, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{(bx+a)^3}}}{x^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(1/(b*x+a)^3*c)/x^3,x)
```

```
[Out] int(f^(1/(b*x+a)^3*c)/x^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{(bx+a)^3}}}{x^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3)/x^3,x, algorithm="maxima")
```

```
[Out] integrate(f^(c/(b*x + a)^3)/x^3, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.06

$$\int \frac{f^{\frac{c}{(a+b\,x)^3}}}{x^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x)^3)/x^3,x)
```

```
[Out] int(f^(c/(a + b*x)^3)/x^3, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{\frac{c}{(a+bx)^3}}}{x^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a)**3)/x**3,x)
```

```
[Out] Integral(f**(c/(a + b*x)**3)/x**3, x)
```

3.240 $\int f^{c(a+bx)^3} x^m \, dx$

Optimal. Leaf size=18

$$\mathrm{Int}\left(x^m f^{c(a+bx)^3}, x\right)$$

```
[Out] CannotIntegrate(f^(c*(b*x+a)^3)*x^m,x)
```

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int f^{c(a+bx)^3} x^m \, dx$$

Verification is Not applicable to the result.

```
[In] Int[f^(c*(a + b*x)^3)*x^m,x]
[Out] Defer[Int][f^(c*(a + b*x)^3)*x^m, x]
```

Rubi steps

$$\int f^{c(a+bx)^3} x^m \, dx = \int f^{c(a+bx)^3} x^m \, dx$$

Mathematica [A] time = 0.25, size = 0, normalized size = 0.00

$$\int f^{c(a+bx)^3} x^m \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[f^(c*(a + b*x)^3)*x^m,x]
[Out] Integrate[f^(c*(a + b*x)^3)*x^m, x]
```

fricas [A] time = 0.43, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(f^{b^3cx^3+3\,ab^2cx^2+3\,a^2bcx+a^3c} x^m, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^3)*x^m,x, algorithm="fricas")
[Out] integral(f^(b^3*c*x^3 + 3*a*b^2*c*x^2 + 3*a^2*b*c*x + a^3*c)*x^m, x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{(bx+a)^3c}x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^3)*x^m,x, algorithm="giac")
[Out] integrate(f^((b*x + a)^3*c)*x^m, x)
```

maple [A] time = 0.06, size = 0, normalized size = 0.00

$$\int f^{(bx+a)^3c}x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^((b*x+a)^3*c)*x^m,x)
[Out] int(f^((b*x+a)^3*c)*x^m,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{(bx+a)^3c}x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^3)*x^m,x, algorithm="maxima")
[Out] integrate(f^((b*x + a)^3*c)*x^m, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.06

$$\int f^{c\,(a+b\,x)^3}\,x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(a + b*x)^3)*x^m,x)
[Out] int(f^(c*(a + b*x)^3)*x^m, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{c(a+bx)^3}x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*(b*x+a)**3)*x***m,x)
[Out] Integral(f**(c*(a + b*x)**3)*x***m, x)
```

3.241 $\int f^{c(a+bx)^2} x^m \, dx$

Optimal. Leaf size=29

$$\text{Int}\left(x^m f^{a^2c+2abcx+b^2cx^2},x\right)$$

```
[Out] Unintegrable(f^(b^2*c*x^2+2*a*b*c*x+a^2*c)*x^m,x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int f^{c(a+bx)^2} x^m \, dx$$

Verification is Not applicable to the result.

```
[In] Int[f^(c*(a + b*x)^2)*x^m,x]
```

```
[Out] Defer[Int][f^(a^2*c + 2*a*b*c*x + b^2*c*x^2)*x^m, x]
```

Rubi steps

$$\int f^{c(a+bx)^2} x^m \, dx = \int f^{a^2c+2abcx+b^2cx^2} x^m \, dx$$

Mathematica [A] time = 0.15, size = 0, normalized size = 0.00

$$\int f^{c(a+bx)^2} x^m \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[f^(c*(a + b*x)^2)*x^m,x]
```

```
[Out] Integrate[f^(c*(a + b*x)^2)*x^m, x]
```

fricas [A] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(f^{b^2cx^2+2\,abcx+a^2c}x^m,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^2)*x^m,x, algorithm="fricas")
```

```
[Out] integral(f^(b^2*c*x^2 + 2*a*b*c*x + a^2*c)*x^m, x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{(bx+a)^2c}x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^2)*x^m,x, algorithm="giac")
```

```
[Out] integrate(f^((b*x + a)^2*c)*x^m, x)
```

maple [A] time = 0.06, size = 0, normalized size = 0.00

$$\int f^{(bx+a)^2c}x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^((b*x+a)^2*c)*x^m,x)
```

```
[Out] int(f^((b*x+a)^2*c)*x^m,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{(bx+a)^2c}x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^2)*x^m,x, algorithm="maxima")
```

```
[Out] integrate(f^((b*x + a)^2*c)*x^m, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int f^{c\,(a+b\,x)^2}\,x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(a + b*x)^2)*x^m,x)
```

```
[Out] int(f^(c*(a + b*x)^2)*x^m, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{c(a+bx)^2}x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*(b*x+a)**2)*x**m,x)
```

```
[Out] Integral(f**(c*(a + b*x)**2)*x**m, x)
```

3.242 $\int f^{c(a+bx)}x^m\,dx$

Optimal. Leaf size=41

$$\frac{x^m f^{ac}(-bcx\log(f))^{-m}\Gamma(m+1,-bcx\log(f))}{bc\log(f)}$$

```
[Out] f^(a*c)*x^m*GAMMA(1+m,-b*c*x*ln(f))/b/c/ln(f)/((-b*c*x*ln(f))^m)
```

Rubi [A] time = 0.02, antiderivative size = 41, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2181}

$$\frac{x^m f^{ac}(-bcx\log(f))^{-m}\text{Gamma}(m+1,-bcx\log(f))}{bc\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c*(a + b*x))*x^m,x]
```

```
[Out] (f^(a*c)*x^m*Gamma[1 + m, -(b*c*x*Log[f])])/(b*c*Log[f]*(-(b*c*x*Log[f]))^m
)
```

Rule 2181

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> -Simp[(F^(g*(e - (c*f)/d))*(c + d*x)^FracPart[m]*Gamma[m + 1, (-((f*g*Lo
g[F])/d))*(c + d*x)])/(d*(-((f*g*Log[F])/d))^(IntPart[m] + 1)*(-((f*g*Log[F
]*(c + d*x))/d))^FracPart[m]), x] /; FreeQ[{F, c, d, e, f, g, m}, x] && !I
ntegerQ[m]
```

Rubi steps

$$\int f^{c(a+bx)}x^m\,dx = \frac{f^{ac}x^m\Gamma(1+m,-bcx\log(f))(-bcx\log(f))^{-m}}{bc\log(f)}$$

Mathematica [A] time = 0.01, size = 36, normalized size = 0.88

$$x^{m+1}\left(-f^{ac}\right)(-bcx\log(f))^{-m-1}\Gamma(m+1,-bcx\log(f))$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c*(a + b*x))*x^m,x]
```

```
[Out] -(f^(a*c)*x^(1 + m)*Gamma[1 + m, -(b*c*x*Log[f])]*(-(b*c*x*Log[f]))^(-1 - m
))
```

fricas [A] time = 0.45, size = 39, normalized size = 0.95

$$\frac{e^{\left(ac\log(f)-m\log\left(-bc\log(f)\right)\right)}\Gamma\left(m+1,-bcx\log(f)\right)}{bc\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a))*x^m,x, algorithm="fricas")
```

```
[Out] e^(a*c*log(f) - m*log(-b*c*log(f)))*gamma(m + 1, -b*c*x*log(f))/(b*c*log(f)
)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{(bx+a)c}x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a))*x^m,x, algorithm="giac")
```

```
[Out] integrate(f^((b*x + a)*c)*x^m, x)
```

maple [B] time = 0.05, size = 117, normalized size = 2.85

$$-\frac{\left(m\,x^m\,(-bc)^m\left(-bcx\ln(f)\right)^{-m}\ln(f)^m\Gamma(m)-m\,x^m\,(-bc)^m\left(-bcx\ln(f)\right)^{-m}\ln(f)^m\Gamma\left(m,-bcx\ln(f)\right)-x^m\,(-bc)^m}{bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^((b*x+a)*c)*x^m,x)
```

```
[Out] -f^(a*c)*(-b*c)^(-m)*ln(f)^(-m-1)/b/c*(x^m*(-b*c)^m*ln(f)^m*m*GAMMA(m)*(-b*
c*x*ln(f))^(-m)-x^m*(-b*c)^m*ln(f)^m*exp(b*c*x*ln(f))-x^m*(-b*c)^m*ln(f)^m*
m*(-b*c*x*ln(f))^(-m)*GAMMA(m,-b*c*x*ln(f)))
```

maxima [A] time = 1.34, size = 36, normalized size = 0.88

$$-\left(-bcx\log(f)\right)^{-m-1}f^{ac}x^{m+1}\Gamma\left(m+1,-bcx\log(f)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a))*x^m,x, algorithm="maxima")
```

```
[Out] -(-b*c*x*log(f))^(-m - 1)*f^(a*c)*x^(m + 1)*gamma(m + 1, -b*c*x*log(f))
```

mupad [B] time = 3.50, size = 41, normalized size = 1.00

$$\frac{f^{a\,c}\,x^m\,\Gamma\left(m+1,-b\,c\,x\,\ln(f)\right)}{b\,c\,\ln(f)\,\left(-b\,c\,x\,\ln(f)\right)^m}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(a + b*x))*x^m,x)
[Out] (f^(a*c)*x^m*igamma(m + 1, -b*c*x*log(f)))/(b*c*log(f)*(-b*c*x*log(f))^m)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{c(a+bx)}x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*(b*x+a))*x**m,x)
[Out] Integral(f**(c*(a + b*x))*x**m, x)
```

3.243 $\int f^{\frac{c}{a+bx}} x^m \, dx$

Optimal. Leaf size=18

$$\text{Int}\left(x^m f^{\frac{c}{a+bx}}, x\right)$$

```
[Out] CannotIntegrate(f^(c/(b*x+a))*x^m,x)
```

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int f^{\frac{c}{a+bx}} x^m \, dx$$

Verification is Not applicable to the result.

```
[In] Int[f^(c/(a + b*x))*x^m,x]
[Out] Defer[Int][f^(c/(a + b*x))*x^m, x]
```

Rubi steps

$$\int f^{\frac{c}{a+bx}} x^m \, dx = \int f^{\frac{c}{a+bx}} x^m \, dx$$

Mathematica [A] time = 0.05, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{a+bx}} x^m \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[f^(c/(a + b*x))*x^m,x]
[Out] Integrate[f^(c/(a + b*x))*x^m, x]
```

fricas [A] time = 0.45, size = 0, normalized size = 0.00

$$\text{integral}\left(f^{\frac{c}{bx+a}} x^m, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a))*x^m,x, algorithm="fricas")
[Out] integral(f^(c/(b*x + a))*x^m, x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{bx+a}} x^m \,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a))*x^m,x, algorithm="giac")
[Out] integrate(f^(c/(b*x + a))*x^m, x)
```

maple [A] time = 0.06, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{bx+a}} x^m \,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(1/(b*x+a)*c)*x^m,x)
[Out] int(f^(1/(b*x+a)*c)*x^m,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{bx+a}} x^m \,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a))*x^m,x, algorithm="maxima")
[Out] integrate(f^(c/(b*x + a))*x^m, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.06

$$\int f^{\frac{c}{a+b\,x}}\,x^m \,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x))*x^m,x)
[Out] int(f^(c/(a + b*x))*x^m, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{a+bx}} x^m \,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a))*x**m,x)
[Out] Integral(f**(c/(a + b*x))*x**m, x)
```

3.244 $\int f^{\frac{c}{(a+bx)^2}} x^m \, dx$

Optimal. Leaf size=18

$$\text{Int}\left(x^m f^{\frac{c}{(a+bx)^2}}, x\right)$$

```
[Out] CannotIntegrate(f^(c/(b*x+a)^2)*x^m,x)
```

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int f^{\frac{c}{(a+bx)^2}} x^m \, dx$$

Verification is Not applicable to the result.

```
[In] Int[f^(c/(a + b*x)^2)*x^m,x]
```

```
[Out] Defer[Int][f^(c/(a + b*x)^2)*x^m, x]
```

Rubi steps

$$\int f^{\frac{c}{(a+bx)^2}} x^m \, dx = \int f^{\frac{c}{(a+bx)^2}} x^m \, dx$$

Mathematica [A] time = 0.09, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{(a+bx)^2}} x^m \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[f^(c/(a + b*x)^2)*x^m,x]
```

```
[Out] Integrate[f^(c/(a + b*x)^2)*x^m, x]
```

fricas [A] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(f^{\frac{c}{b^2x^2+2\,abx+a^2}} x^m, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^2)*x^m,x, algorithm="fricas")
```

```
[Out] integral(f^(c/(b^2*x^2 + 2*a*b*x + a^2))*x^m, x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{(bx+a)^2}} x^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^2)*x^m,x, algorithm="giac")
[Out] integrate(f^(c/(b*x + a)^2)*x^m, x)
```

maple [A] time = 0.06, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{(bx+a)^2}} x^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(1/(b*x+a)^2*c)*x^m,x)
[Out] int(f^(1/(b*x+a)^2*c)*x^m,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{(bx+a)^2}} x^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^2)*x^m,x, algorithm="maxima")
[Out] integrate(f^(c/(b*x + a)^2)*x^m, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.06

$$\int f^{\frac{c}{(a+b\,x)^2}}\,x^m \,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x)^2)*x^m,x)
[Out] int(f^(c/(a + b*x)^2)*x^m, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{(a+bx)^2}} x^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a)**2)*x**m,x)
```

```
[Out] Integral(f**(c/(a + b*x)**2)*x**m, x)
```

3.245 $\int f^{\frac{c}{(a+bx)^3}} x^m \, dx$

Optimal. Leaf size=18

$$\text{Int}\left(x^m f^{\frac{c}{(a+bx)^3}}, x\right)$$

```
[Out] CannotIntegrate(f^(c/(b*x+a)^3)*x^m,x)
```

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int f^{\frac{c}{(a+bx)^3}} x^m \, dx$$

Verification is Not applicable to the result.

```
[In] Int[f^(c/(a + b*x)^3)*x^m,x]
```

```
[Out] Defer[Int][f^(c/(a + b*x)^3)*x^m, x]
```

Rubi steps

$$\int f^{\frac{c}{(a+bx)^3}} x^m \, dx = \int f^{\frac{c}{(a+bx)^3}} x^m \, dx$$

Mathematica [A] time = 0.08, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{(a+bx)^3}} x^m \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[f^(c/(a + b*x)^3)*x^m,x]
```

```
[Out] Integrate[f^(c/(a + b*x)^3)*x^m, x]
```

fricas [A] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(f^{\frac{c}{b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3}} x^m, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3)*x^m,x, algorithm="fricas")
```

```
[Out] integral(f^(c/(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3))*x^m, x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{(bx+a)^3}} x^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3)*x^m,x, algorithm="giac")
[Out] integrate(f^(c/(b*x + a)^3)*x^m, x)
```

maple [A] time = 0.07, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{(bx+a)^3}} x^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(1/(b*x+a)^3*c)*x^m,x)
[Out] int(f^(1/(b*x+a)^3*c)*x^m,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{(bx+a)^3}} x^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c/(b*x+a)^3)*x^m,x, algorithm="maxima")
[Out] integrate(f^(c/(b*x + a)^3)*x^m, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.06

$$\int f^{\frac{c}{(a+b\,x)^3}}\, x^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c/(a + b*x)^3)*x^m,x)
[Out] int(f^(c/(a + b*x)^3)*x^m, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{\frac{c}{(a+bx)^3}} x^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c/(b*x+a)**3)*x**m,x)
```

```
[Out] Integral(f**(c/(a + b*x)**3)*x**m, x)
```

3.246 $\int f^{c(a+bx)^n} x^m \, dx$

Optimal. Leaf size=18

$$\text{Int}\left(x^m f^{c(a+bx)^n}, x\right)$$

```
[Out] CannotIntegrate(f^(c*(b*x+a)^n)*x^m,x)
```

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int f^{c(a+bx)^n} x^m \, dx$$

Verification is Not applicable to the result.

```
[In] Int[f^(c*(a + b*x)^n)*x^m,x]
[Out] Defer[Int][f^(c*(a + b*x)^n)*x^m, x]
```

Rubi steps

$$\int f^{c(a+bx)^n} x^m \, dx = \int f^{c(a+bx)^n} x^m \, dx$$

Mathematica [A] time = 0.05, size = 0, normalized size = 0.00

$$\int f^{c(a+bx)^n} x^m \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[f^(c*(a + b*x)^n)*x^m,x]
[Out] Integrate[f^(c*(a + b*x)^n)*x^m, x]
```

fricas [A] time = 0.45, size = 0, normalized size = 0.00

$$\text{integral}\left(f^{(bx+a)^n c} x^m, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^n)*x^m,x, algorithm="fricas")
[Out] integral(f^((b*x + a)^n*c)*x^m, x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{(bx+a)^n c} x^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^n)*x^m,x, algorithm="giac")
```

```
[Out] integrate(f^((b*x + a)^n*c)*x^m, x)
```

maple [A] time = 0.04, size = 0, normalized size = 0.00

$$\int f^{c(bx+a)^n} x^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(b*x+a)^n)*x^m,x)
```

```
[Out] int(f^(c*(b*x+a)^n)*x^m,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{(bx+a)^n c} x^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^n)*x^m,x, algorithm="maxima")
```

```
[Out] integrate(f^((b*x + a)^n*c)*x^m, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.06

$$\int f^{c\,(a+b\,x)^n} \, x^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(a + b*x)^n)*x^m,x)
```

```
[Out] int(f^(c*(a + b*x)^n)*x^m, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{c(a+bx)^n} x^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*(b*x+a)**n)*x**m,x)
```

```
[Out] Integral(f**(c*(a + b*x)**n)*x**m, x)
```

3.247 $\int f^{c(a+bx)^n} x^3\,dx$

Optimal. Leaf size=207

$$\frac{a^3(a+bx)\left(-c\log(f)(a+bx)^n\right)^{-1/n}\Gamma\left(\frac{1}{n},-c(a+bx)^n\log(f)\right)}{b^4n}-\frac{3a^2(a+bx)^2\left(-c\log(f)(a+bx)^n\right)^{-2/n}\Gamma\left(\frac{2}{n},-c(a+\right.}{b^4n}$$

```
[Out] -(b*x+a)^4*GAMMA(4/n,-c*(b*x+a)^n*ln(f))/b^4/n/((-c*(b*x+a)^n*ln(f))^(4/n))
+3*a*(b*x+a)^3*GAMMA(3/n,-c*(b*x+a)^n*ln(f))/b^4/n/((-c*(b*x+a)^n*ln(f))^(3
/n))-3*a^2*(b*x+a)^2*GAMMA(2/n,-c*(b*x+a)^n*ln(f))/b^4/n/((-c*(b*x+a)^n*ln(
f))^(2/n))+a^3*(b*x+a)*GAMMA(1/n,-c*(b*x+a)^n*ln(f))/b^4/n/((-c*(b*x+a)^n*l
n(f))^(1/n))
```

Rubi [A] time = 0.16, antiderivative size = 207, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2226, 2208, 2218}

$$-\frac{3a^2(a+bx)^2\left(-c\log(f)(a+bx)^n\right)^{-2/n}\text{Gamma}\left(\frac{2}{n},-c\log(f)(a+bx)^n\right)}{b^4n}+\frac{a^3(a+bx)\left(-c\log(f)(a+bx)^n\right)^{-1/n}\text{G}}{b^4n}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c*(a + b*x)^n)*x^3,x]
```

```
[Out] -(((a + b*x)^4*Gamma[4/n, -(c*(a + b*x)^n*Log[f])])/(b^4*n*(-(c*(a + b*x)^n
*Log[f]))^(4/n))) + (3*a*(a + b*x)^3*Gamma[3/n, -(c*(a + b*x)^n*Log[f])])/(
b^4*n*(-(c*(a + b*x)^n*Log[f]))^(3/n)) - (3*a^2*(a + b*x)^2*Gamma[2/n, -(c*
(a + b*x)^n*Log[f])])/(b^4*n*(-(c*(a + b*x)^n*Log[f]))^(2/n)) + (a^3*(a + b
*x)*Gamma[n^(-1), -(c*(a + b*x)^n*Log[f])])/(b^4*n*(-(c*(a + b*x)^n*Log[f])
)^n^(-1))
```

Rule 2208

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> -Simp[(F^a
*(c + d*x)*Gamma[1/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x)^n*Log[F
]))^(1/n)), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2226

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int f^{c(a+bx)^n}x^3\,dx = \int\left(-\frac{a^3 f^{c(a+bx)^n}}{b^3}+\frac{3a^2 f^{c(a+bx)^n}(a+bx)}{b^3}-\frac{3af^{c(a+bx)^n}(a+bx)^2}{b^3}+\frac{f^{c(a+bx)^n}(a+bx)^3}{b^3}\right)dx$$
$$=\frac{\int f^{c(a+bx)^n}(a+bx)^3\,dx}{b^3}-\frac{(3a)\int f^{c(a+bx)^n}(a+bx)^2\,dx}{b^3}+\frac{\left(3a^2\right)\int f^{c(a+bx)^n}(a+bx)\,dx}{b^3}-\frac{a^3\int f^{c(}}{b}$$
$$=-\frac{(a+bx)^4\Gamma\left(\frac{4}{n},-c(a+bx)^n\log(f)\right)\left(-c(a+bx)^n\log(f)\right)^{-4/n}}{b^4n}+\frac{3a(a+bx)^3\Gamma\left(\frac{3}{n},-c(a+bx)^n\,\mathrm{l}\right.}{b}$$

Mathematica [A] time = 0.16, size = 183, normalized size = 0.88

$$-\frac{(a+bx)\left(-c\log(f)(a+bx)^n\right)^{-4/n}\left((a+bx)^3\Gamma\left(\frac{4}{n},-c(a+bx)^n\log(f)\right)-a\left(-c\log(f)(a+bx)^n\right)^{\frac{1}{n}}\left(a\left(-c\log(f)(a\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c*(a + b*x)^n)*x^3,x]
```

```
[Out] -(((a + b*x)*((a + b*x)^3*Gamma[4/n, -(c*(a + b*x)^n*Log[f])] - a*(-(c*(a +
 b*x)^n*Log[f]))^n^(-1)*(3*(a + b*x)^2*Gamma[3/n, -(c*(a + b*x)^n*Log[f])]
+ a*(-(c*(a + b*x)^n*Log[f]))^n^(-1)*(-3*(a + b*x)*Gamma[2/n, -(c*(a + b*x)
^n*Log[f])] + a*Gamma[n^(-1), -(c*(a + b*x)^n*Log[f])]*(-(c*(a + b*x)^n*Log
[f]))^n^(-1)))))/(b^4*n*(-(c*(a + b*x)^n*Log[f]))^(4/n)))
```

fricas [F] time = 0.45, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(f^{(bx+a)^n c}x^3, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^n)*x^3,x, algorithm="fricas")
```

```
[Out] integral(f^((b*x + a)^n*c)*x^3, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{(bx+a)^n c} x^3 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^n)*x^3,x, algorithm="giac")
[Out] integrate(f^((b*x + a)^n*c)*x^3, x)
```

maple [F] time = 0.03, size = 0, normalized size = 0.00

$$\int x^3 f^{c(bx+a)^n} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(b*x+a)^n)*x^3,x)
[Out] int(f^(c*(b*x+a)^n)*x^3,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{(bx+a)^n c} x^3 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^n)*x^3,x, algorithm="maxima")
[Out] integrate(f^((b*x + a)^n*c)*x^3, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int f^{c\,(a+b\,x)^n}\, x^3 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(a + b*x)^n)*x^3,x)
[Out] int(f^(c*(a + b*x)^n)*x^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{c(a+bx)^n} x^3 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*(b*x+a)**n)*x**3,x)
[Out] Integral(f**(c*(a + b*x)**n)*x**3, x)
```

3.248 $\int f^{c(a+bx)^n} x^2 \, dx$

Optimal. Leaf size=154

$$-\frac{a^2(a+bx)\left(-c\log(f)(a+bx)^n\right)^{-1/n}\Gamma\left(\frac{1}{n},-c(a+bx)^n\log(f)\right)}{b^3n}-\frac{(a+bx)^3\left(-c\log(f)(a+bx)^n\right)^{-3/n}\Gamma\left(\frac{3}{n},-c(a+b\right.}{b^3n}$$

```
[Out] -(b*x+a)^3*GAMMA(3/n,-c*(b*x+a)^n*ln(f))/b^3/n/((-c*(b*x+a)^n*ln(f))^(3/n))
+2*a*(b*x+a)^2*GAMMA(2/n,-c*(b*x+a)^n*ln(f))/b^3/n/((-c*(b*x+a)^n*ln(f))^(2
/n))-a^2*(b*x+a)*GAMMA(1/n,-c*(b*x+a)^n*ln(f))/b^3/n/((-c*(b*x+a)^n*ln(f))^
(1/n))
```

Rubi [A] time = 0.11, antiderivative size = 154, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2226, 2208, 2218}

$$-\frac{a^2(a+bx)\left(-c\log(f)(a+bx)^n\right)^{-1/n}\text{Gamma}\left(\frac{1}{n},-c\log(f)(a+bx)^n\right)}{b^3n}-\frac{(a+bx)^3\left(-c\log(f)(a+bx)^n\right)^{-3/n}\text{Gamm}}{b^3n}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c*(a + b*x)^n)*x^2,x]
```

```
[Out] -(((a + b*x)^3*Gamma[3/n, -(c*(a + b*x)^n*Log[f])])/(b^3*n*(-(c*(a + b*x)^n
*Log[f]))^(3/n))) + (2*a*(a + b*x)^2*Gamma[2/n, -(c*(a + b*x)^n*Log[f])])/(
b^3*n*(-(c*(a + b*x)^n*Log[f]))^(2/n)) - (a^2*(a + b*x)*Gamma[n^(-1), -(c*(
a + b*x)^n*Log[f])])/(b^3*n*(-(c*(a + b*x)^n*Log[f]))^n^(-1))
```

Rule 2208

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> -Simp[(F^a
*(c + d*x)*Gamma[1/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x)^n*Log[F
]))^(1/n)), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2226

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
```

```
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int f^{c(a+bx)^n}x^2\,dx = \int\left(\frac{a^2f^{c(a+bx)^n}}{b^2}-\frac{2af^{c(a+bx)^n}(a+bx)}{b^2}+\frac{f^{c(a+bx)^n}(a+bx)^2}{b^2}\right)dx$$
$$=\frac{\int f^{c(a+bx)^n}(a+bx)^2\,dx}{b^2}-\frac{(2a)\int f^{c(a+bx)^n}(a+bx)\,dx}{b^2}+\frac{a^2\int f^{c(a+bx)^n}\,dx}{b^2}$$
$$=-\frac{(a+bx)^3\Gamma\left(\frac{3}{n},-c(a+bx)^n\log(f)\right)\left(-c(a+bx)^n\log(f)\right)^{-3/n}}{b^3n}+\frac{2a(a+bx)^2\Gamma\left(\frac{2}{n},-c(a+bx)^n\right.}{}$$

Mathematica [A] time = 0.08, size = 136, normalized size = 0.88

$$-\frac{(a+bx)\left(-c\log(f)(a+bx)^n\right)^{-3/n}\left(a\left(-c\log(f)(a+bx)^n\right)^{\frac{1}{n}}\left(a\left(-c\log(f)(a+bx)^n\right)^{\frac{1}{n}}\Gamma\left(\frac{1}{n},-c(a+bx)^n\log(f)\right)\right.\right.}{b^3n}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c*(a + b*x)^n)*x^2,x]
```

```
[Out] -(((a + b*x)*((a + b*x)^2*Gamma[3/n, -(c*(a + b*x)^n*Log[f])] + a*(-(c*(a +
 b*x)^n*Log[f]))^n^(-1)*(-2*(a + b*x)*Gamma[2/n, -(c*(a + b*x)^n*Log[f])] +
 a*Gamma[n^(-1), -(c*(a + b*x)^n*Log[f])]*(-(c*(a + b*x)^n*Log[f]))^n^(-1))
))/(b^3*n*(-(c*(a + b*x)^n*Log[f]))^(3/n)))
```

fricas [F] time = 0.46, size = 0, normalized size = 0.00

$$\text{integral}\left(f^{(bx+a)^nc}x^2,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^n)*x^2,x, algorithm="fricas")
```

```
[Out] integral(f^((b*x + a)^n*c)*x^2, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{(bx+a)^nc}x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^n)*x^2,x, algorithm="giac")
[Out] integrate(f^((b*x + a)^n*c)*x^2, x)
```

maple [F] time = 0.06, size = 0, normalized size = 0.00

$$\int x^2 f^{c(bx+a)^n}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(b*x+a)^n)*x^2,x)
[Out] int(f^(c*(b*x+a)^n)*x^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{(bx+a)^n c} x^2\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^n)*x^2,x, algorithm="maxima")
[Out] integrate(f^((b*x + a)^n*c)*x^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int f^{c\,(a+b\,x)^n}\, x^2\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(a + b*x)^n)*x^2,x)
[Out] int(f^(c*(a + b*x)^n)*x^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{c(a+bx)^n} x^2\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*(b*x+a)**n)*x**2,x)
[Out] Integral(f**(c*(a + b*x)**n)*x**2, x)
```

3.249 $\int f^{c(a+bx)^n} x\,dx$

Optimal. Leaf size=99

$$\frac{a(a+bx)\left(-c\log(f)(a+bx)^n\right)^{-1/n}\Gamma\left(\frac{1}{n},-c(a+bx)^n\log(f)\right)}{b^2n}-\frac{(a+bx)^2\left(-c\log(f)(a+bx)^n\right)^{-2/n}\Gamma\left(\frac{2}{n},-c(a+bx\right.}{b^2n}$$

```
[Out] -(b*x+a)^2*GAMMA(2/n,-c*(b*x+a)^n*ln(f))/b^2/n/((-c*(b*x+a)^n*ln(f))^(2/n))
+a*(b*x+a)*GAMMA(1/n,-c*(b*x+a)^n*ln(f))/b^2/n/((-c*(b*x+a)^n*ln(f))^(1/n))
```

Rubi [A] time = 0.06, antiderivative size = 99, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231, Rules used = {2226, 2208, 2218}

$$\frac{a(a+bx)\left(-c\log(f)(a+bx)^n\right)^{-1/n}\text{Gamma}\left(\frac{1}{n},-c\log(f)(a+bx)^n\right)}{b^2n}-\frac{(a+bx)^2\left(-c\log(f)(a+bx)^n\right)^{-2/n}\text{Gamma}}{b^2n}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c*(a + b*x)^n)*x,x]
```

```
[Out] -(((a + b*x)^2*Gamma[2/n, -(c*(a + b*x)^n*Log[f])])/(b^2*n*(-(c*(a + b*x)^n
*Log[f]))^(2/n))) + (a*(a + b*x)*Gamma[n^(-1), -(c*(a + b*x)^n*Log[f])])/(b
^2*n*(-(c*(a + b*x)^n*Log[f]))^n^(-1))
```

Rule 2208

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> -Simp[(F^a
*(c + d*x)*Gamma[1/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x)^n*Log[F
]))^(1/n)), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2226

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int f^{c(a+bx)^n} x\,dx = \int \left(-\frac{af^{c(a+bx)^n}}{b} + \frac{f^{c(a+bx)^n}(a+bx)}{b}\right) dx$$
$$= \frac{\int f^{c(a+bx)^n}(a+bx)\,dx}{b} - \frac{a\int f^{c(a+bx)^n}\,dx}{b}$$
$$= -\frac{(a+bx)^2\Gamma\left(\frac{2}{n}, -c(a+bx)^n \log(f)\right)\left(-c(a+bx)^n \log(f)\right)^{-2/n}}{b^2n} + \frac{a(a+bx)\Gamma\left(\frac{1}{n}, -c(a+bx)^n \log(\right.}{b^2 n}$$

Mathematica [A] time = 0.04, size = 91, normalized size = 0.92

$$-\frac{(a+bx)\left(-c\log(f)(a+bx)^n\right)^{-2/n}\left((a+bx)\Gamma\left(\frac{2}{n}, -c(a+bx)^n\log(f)\right) - a\left(-c\log(f)(a+bx)^n\right)^{\frac{1}{n}}\Gamma\left(\frac{1}{n}, -c(a+bx)^n\right.\right.}{b^2n}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c*(a + b*x)^n)*x,x]
```

```
[Out] -(((a + b*x)*((a + b*x)*Gamma[2/n, -(c*(a + b*x)^n*Log[f])] - a*Gamma[n^(-1
), -(c*(a + b*x)^n*Log[f])]*(-(c*(a + b*x)^n*Log[f]))^n^(-1)))/(b^2*n*(-(c*
(a + b*x)^n*Log[f]))^(2/n)))
```

fricas [F] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(f^{(bx+a)^n c}x, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^n)*x,x, algorithm="fricas")
```

```
[Out] integral(f^((b*x + a)^n*c)*x, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{(bx+a)^n c}x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^n)*x,x, algorithm="giac")
```

```
[Out] integrate(f^((b*x + a)^n*c)*x, x)
```

maple [F] time = 0.05, size = 0, normalized size = 0.00

$$\int x\,f^{c(bx+a)^n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(b*x+a)^n)*x,x)
```

```
[Out] int(f^(c*(b*x+a)^n)*x,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{(bx+a)^n c}x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^n)*x,x, algorithm="maxima")
```

```
[Out] integrate(f^((b*x + a)^n*c)*x, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int f^{c\,(a+b\,x)^n}\,x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(a + b*x)^n)*x,x)
```

```
[Out] int(f^(c*(a + b*x)^n)*x, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{c(a+bx)^n}x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*(b*x+a)**n)*x,x)
```

```
[Out] Integral(f**(c*(a + b*x)**n)*x, x)
```

3.250 $\int f^{c(a+bx)^n}\,dx$

Optimal. Leaf size=47

$$-\frac{(a+bx)\left(-c\log(f)(a+bx)^n\right)^{-1/n}\Gamma\left(\frac{1}{n},-c(a+bx)^n\log(f)\right)}{bn}$$

```
[Out] -(b*x+a)*GAMMA(1/n,-c*(b*x+a)^n*ln(f))/b/n/((-c*(b*x+a)^n*ln(f))^(1/n))
```

Rubi [A] time = 0.01, antiderivative size = 47, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {2208}

$$-\frac{(a+bx)\left(-c\log(f)(a+bx)^n\right)^{-1/n}\text{Gamma}\left(\frac{1}{n},-c\log(f)(a+bx)^n\right)}{bn}$$

Antiderivative was successfully verified.

```
[In] Int[f^(c*(a + b*x)^n),x]
```

```
[Out] -(((a + b*x)*Gamma[n^(-1), -(c*(a + b*x)^n*Log[f])])/(b*n*(-(c*(a + b*x)^n*
Log[f]))^n^(-1)))
```

Rule 2208

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> -Simp[(F^a
*(c + d*x)*Gamma[1/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x)^n*Log[F
]))^(1/n)), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rubi steps

$$\int f^{c(a+bx)^n}\,dx=-\frac{(a+bx)\Gamma\left(\frac{1}{n},-c(a+bx)^n\log(f)\right)\left(-c(a+bx)^n\log(f)\right)^{-1/n}}{bn}$$

Mathematica [A] time = 0.01, size = 47, normalized size = 1.00

$$-\frac{(a+bx)\left(-c\log(f)(a+bx)^n\right)^{-1/n}\Gamma\left(\frac{1}{n},-c(a+bx)^n\log(f)\right)}{bn}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(c*(a + b*x)^n),x]
```

```
[Out] -(((a + b*x)*Gamma[n^(-1), -(c*(a + b*x)^n*Log[f])])/(b*n*(-(c*(a + b*x)^n*
Log[f]))^n^(-1)))
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(f^{(bx+a)^n c}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^n),x, algorithm="fricas")
```

```
[Out] integral(f^((b*x + a)^n*c), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{(bx+a)^n c}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^n),x, algorithm="giac")
```

```
[Out] integrate(f^((b*x + a)^n*c), x)
```

maple [F] time = 0.04, size = 0, normalized size = 0.00

$$\int f^{c(bx+a)^n}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(b*x+a)^n),x)
```

```
[Out] int(f^(c*(b*x+a)^n),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{(bx+a)^n c}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^n),x, algorithm="maxima")
```

```
[Out] integrate(f^((b*x + a)^n*c), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int f^{c\,(a+b\,x)^n}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(a + b*x)^n),x)
```

```
[Out] int(f^(c*(a + b*x)^n), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{c(a+bx)^n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*(b*x+a)**n),x)
```

```
[Out] Integral(f**(c*(a + b*x)**n), x)
```

3.251 $\int \frac{f^{c(a+bx)^n}}{x} \, dx$

Optimal. Leaf size=18

$$\text{Int}\left(\frac{f^{c(a+bx)^n}}{x}, x\right)$$

```
[Out] Unintegrable(f^(c*(b*x+a)^n)/x,x)
```

Rubi [A] time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{f^{c(a+bx)^n}}{x} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[f^(c*(a + b*x)^n)/x,x]
```

```
[Out] Defer[Int][f^(c*(a + b*x)^n)/x, x]
```

Rubi steps

$$\int \frac{f^{c(a+bx)^n}}{x} \, dx = \int \frac{f^{c(a+bx)^n}}{x} \, dx$$

Mathematica [A] time = 0.04, size = 0, normalized size = 0.00

$$\int \frac{f^{c(a+bx)^n}}{x} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[f^(c*(a + b*x)^n)/x,x]
```

```
[Out] Integrate[f^(c*(a + b*x)^n)/x, x]
```

fricas [A] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{f^{(bx+a)^n c}}{x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^n)/x,x, algorithm="fricas")
[Out] integral(f^((b*x + a)^n*c)/x, x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{(bx+a)^n c}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^n)/x,x, algorithm="giac")
[Out] integrate(f^((b*x + a)^n*c)/x, x)
```

maple [A] time = 0.04, size = 0, normalized size = 0.00

$$\int \frac{f^{c(bx+a)^n}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(b*x+a)^n)/x,x)
[Out] int(f^(c*(b*x+a)^n)/x,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{(bx+a)^n c}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^n)/x,x, algorithm="maxima")
[Out] integrate(f^((b*x + a)^n*c)/x, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.06

$$\int \frac{f^{c\,(a+b\,x)^n}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(a + b*x)^n)/x,x)
[Out] int(f^(c*(a + b*x)^n)/x, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{c(a+bx)^n}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*(b*x+a)**n)/x,x)
```

```
[Out] Integral(f**(c*(a + b*x)**n)/x, x)
```

3.252 $\int \frac{f^{c(a+bx)^n}}{x^2} \, dx$

Optimal. Leaf size=18

$$\text{Int}\left(\frac{f^{c(a+bx)^n}}{x^2},x\right)$$

```
[Out] CannotIntegrate(f^(c*(b*x+a)^n)/x^2,x)
```

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{f^{c(a+bx)^n}}{x^2} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[f^(c*(a + b*x)^n)/x^2,x]
```

```
[Out] Defer[Int][f^(c*(a + b*x)^n)/x^2, x]
```

Rubi steps

$$\int \frac{f^{c(a+bx)^n}}{x^2} \, dx = \int \frac{f^{c(a+bx)^n}}{x^2} \, dx$$

Mathematica [A] time = 0.03, size = 0, normalized size = 0.00

$$\int \frac{f^{c(a+bx)^n}}{x^2} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[f^(c*(a + b*x)^n)/x^2,x]
```

```
[Out] Integrate[f^(c*(a + b*x)^n)/x^2, x]
```

fricas [A] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{f^{(bx+a)^n c}}{x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^n)/x^2,x, algorithm="fricas")
```

```
[Out] integral(f^((b*x + a)^n*c)/x^2, x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{(bx+a)^n c}}{x^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^n)/x^2,x, algorithm="giac")
```

```
[Out] integrate(f^((b*x + a)^n*c)/x^2, x)
```

maple [A] time = 0.06, size = 0, normalized size = 0.00

$$\int \frac{f^{c(bx+a)^n}}{x^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(b*x+a)^n)/x^2,x)
```

```
[Out] int(f^(c*(b*x+a)^n)/x^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{(bx+a)^n c}}{x^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^n)/x^2,x, algorithm="maxima")
```

```
[Out] integrate(f^((b*x + a)^n*c)/x^2, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.06

$$\int \frac{f^{c\,(a+b\,x)^n}}{x^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(a + b*x)^n)/x^2,x)
```

```
[Out] int(f^(c*(a + b*x)^n)/x^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{c(a+bx)^n}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*(b*x+a)**n)/x**2,x)
```

```
[Out] Integral(f**(c*(a + b*x)**n)/x**2, x)
```

3.253 $\int \frac{f^{c(a+bx)^n}}{x^3} dx$

Optimal. Leaf size=18

$$\text{Int}\left(\frac{f^{c(a+bx)^n}}{x^3},x\right)$$

```
[Out] CannotIntegrate(f^(c*(b*x+a)^n)/x^3,x)
```

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{f^{c(a+bx)^n}}{x^3} dx$$

Verification is Not applicable to the result.

```
[In] Int[f^(c*(a + b*x)^n)/x^3,x]
```

```
[Out] Defer[Int][f^(c*(a + b*x)^n)/x^3, x]
```

Rubi steps

$$\int \frac{f^{c(a+bx)^n}}{x^3} dx = \int \frac{f^{c(a+bx)^n}}{x^3} dx$$

Mathematica [A] time = 0.04, size = 0, normalized size = 0.00

$$\int \frac{f^{c(a+bx)^n}}{x^3} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[f^(c*(a + b*x)^n)/x^3,x]
```

```
[Out] Integrate[f^(c*(a + b*x)^n)/x^3, x]
```

fricas [A] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{f^{(bx+a)^n c}}{x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^n)/x^3,x, algorithm="fricas")
[Out] integral(f^((b*x + a)^n*c)/x^3, x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{(bx+a)^n c}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^n)/x^3,x, algorithm="giac")
[Out] integrate(f^((b*x + a)^n*c)/x^3, x)
```

maple [A] time = 0.03, size = 0, normalized size = 0.00

$$\int \frac{f^{c(bx+a)^n}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(b*x+a)^n)/x^3,x)
[Out] int(f^(c*(b*x+a)^n)/x^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{(bx+a)^n c}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*(b*x+a)^n)/x^3,x, algorithm="maxima")
[Out] integrate(f^((b*x + a)^n*c)/x^3, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.06

$$\int \frac{f^{c\,(a+b\,x)^n}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*(a + b*x)^n)/x^3,x)
[Out] int(f^(c*(a + b*x)^n)/x^3, x)
```

sympy [A]   time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{c(a+bx)^n}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*(b*x+a)**n)/x**3,x)
```

```
[Out] Integral(f**(c*(a + b*x)**n)/x**3, x)
```

3.254 $\int F^{a+b(c+dx)^2}(c+dx)^m\,dx$

Optimal. Leaf size=61

$$-\frac{F^a(c+dx)^{m+1}\left(-b\log(F)(c+dx)^2\right)^{\frac{1}{2}(-m-1)}\Gamma\left(\frac{m+1}{2},-b(c+dx)^2\log(F)\right)}{2d}$$

```
[Out] -1/2*F^a*(d*x+c)^(1+m)*GAMMA(1/2+1/2*m,-b*(d*x+c)^2*ln(F))*(-b*(d*x+c)^2*ln
(F))^(-1/2-1/2*m)/d
```

Rubi [A] time = 0.07, antiderivative size = 61, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2218}

$$-\frac{F^a(c+dx)^{m+1}\left(-b\log(F)(c+dx)^2\right)^{\frac{1}{2}(-m-1)}\text{Gamma}\left(\frac{m+1}{2},-b\log(F)(c+dx)^2\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)*(c + d*x)^m,x]
```

```
[Out] -(F^a*(c + d*x)^(1 + m)*Gamma[(1 + m)/2, -(b*(c + d*x)^2*Log[F])]*(-(b*(c +
 d*x)^2*Log[F]))^((-1 - m)/2))/(2*d)
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+b(c+dx)^2}(c+dx)^m\,dx=-\frac{F^a(c+dx)^{1+m}\Gamma\left(\frac{1+m}{2},-b(c+dx)^2\log(F)\right)\left(-b(c+dx)^2\log(F)\right)^{\frac{1}{2}(-1-m)}}{2d}$$

Mathematica [A] time = 0.04, size = 61, normalized size = 1.00

$$-\frac{F^a(c+dx)^{m+1}\left(-b\log(F)(c+dx)^2\right)^{\frac{1}{2}(-m-1)}\Gamma\left(\frac{m+1}{2},-b(c+dx)^2\log(F)\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)*(c + d*x)^m,x]
```

```
[Out] -1/2*(F^a*(c + d*x)^(1 + m)*Gamma[(1 + m)/2, -(b*(c + d*x)^2*Log[F])]*(-(b*
(c + d*x)^2*Log[F]))^((-1 - m)/2))/d
```

fricas [A] time = 0.42, size = 59, normalized size = 0.97

$$\frac{e^{\left(-\frac{1}{2}\,(m-1)\log\left(-b\log(F)\right)+a\log(F)\right)}\Gamma\left(\frac{1}{2}\,m+\frac{1}{2},-\left(bd^2x^2+2\,bcdx+bc^2\right)\log(F)\right)}{2\,bd\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^m,x, algorithm="fricas")
```

```
[Out] 1/2*e^(-1/2*(m - 1)*log(-b*log(F)) + a*log(F))*gamma(1/2*m + 1/2, -(b*d^2*x
^2 + 2*b*c*d*x + b*c^2)*log(F))/(b*d*log(F))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)^m F^{(dx+c)^2b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^m,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^m*F^((d*x + c)^2*b + a), x)
```

maple [F] time = 0.10, size = 0, normalized size = 0.00

$$\int F^{a+(dx+c)^2b}\,(dx+c)^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^2)*(d*x+c)^m,x)
```

```
[Out] int(F^(a+b*(d*x+c)^2)*(d*x+c)^m,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)^m F^{(dx+c)^2b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^m,x, algorithm="maxima")
```

```
[Out] integrate((d*x + c)^m*F^((d*x + c)^2*b + a), x)
```

mupad [B] time = 3.81, size = 75, normalized size = 1.23

$$\frac{F^a\,\mathrm{e}^{\frac{b\,\ln(F)\,(c+d\,x)^2}{2}}\,(c+d\,x)^{m+1}\,\mathrm{M}_{\frac{1}{4}-\frac{m}{4},\frac{m}{4}+\frac{1}{4}}\left(b\,\ln(F)\,(c+d\,x)^2\right)}{d\,\left(m+1\right)\,\left(b\,\ln(F)\,(c+d\,x)^2\right)^{\frac{m}{4}+\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)*(c + d*x)^m,x)
```

```
[Out] (F^a*exp((b*log(F)*(c + d*x)^2)/2)*(c + d*x)^(m + 1)*whittakerM(1/4 - m/4,
m/4 + 1/4, b*log(F)*(c + d*x)^2))/(d*(m + 1)*(b*log(F)*(c + d*x)^2)^(m/4 +
3/4))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+b(c+dx)^2}\,(c+dx)^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)*(d*x+c)**m,x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**2)*(c + d*x)**m, x)
```

3.255 $\int F^{a+b(c+dx)^2}(c+dx)^{11}\,dx$

Optimal. Leaf size=105

$$-\frac{F^{a+b(c+dx)^2}\left(-b^5\log^5(F)(c+dx)^{10}+5b^4\log^4(F)(c+dx)^8-20b^3\log^3(F)(c+dx)^6+60b^2\log^2(F)(c+dx)^4-12\right.}{2b^6d\log^6(F)}$$

```
[Out] -1/2*F^(a+b*(d*x+c)^2)*(120-120*b*(d*x+c)^2*ln(F)+60*b^2*(d*x+c)^4*ln(F)^2-
20*b^3*(d*x+c)^6*ln(F)^3+5*b^4*(d*x+c)^8*ln(F)^4-b^5*(d*x+c)^10*ln(F)^5)/b^
6/d/ln(F)^6
```

Rubi [C] time = 0.07, antiderivative size = 31, normalized size of antiderivative = 0.30, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2218}

$$-\frac{F^a\text{Gamma}\left(6,-b\log(F)(c+dx)^2\right)}{2b^6d\log^6(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)*(c + d*x)^11,x]
```

```
[Out] -(F^a*Gamma[6, -(b*(c + d*x)^2*Log[F])])/(2*b^6*d*Log[F]^6)
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+b(c+dx)^2}(c+dx)^{11}\,dx=-\frac{F^a\Gamma\left(6,-b(c+dx)^2\log(F)\right)}{2b^6d\log^6(F)}$$

Mathematica [C] time = 0.01, size = 31, normalized size = 0.30

$$-\frac{F^a\Gamma\left(6,-b(c+dx)^2\log(F)\right)}{2b^6d\log^6(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)*(c + d*x)^11,x]
```

```
[Out] -1/2*(F^a*Gamma[6, -(b*(c + d*x)^2*Log[F])])/(b^6*d*Log[F]^6)
```

fricas [B] time = 0.47, size = 468, normalized size = 4.46

$$\frac{\left(\left(b^5d^{10}x^{10} + 10\,b^5cd^9x^9 + 45\,b^5c^2d^8x^8 + 120\,b^5c^3d^7x^7 + 210\,b^5c^4d^6x^6 + 252\,b^5c^5d^5x^5 + 210\,b^5c^6d^4x^4 + 120\,b^5c^7d\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^11,x, algorithm="fricas")
```

```
[Out] 1/2*((b^5*d^10*x^10 + 10*b^5*c*d^9*x^9 + 45*b^5*c^2*d^8*x^8 + 120*b^5*c^3*d
^7*x^7 + 210*b^5*c^4*d^6*x^6 + 252*b^5*c^5*d^5*x^5 + 210*b^5*c^6*d^4*x^4 +
120*b^5*c^7*d^3*x^3 + 45*b^5*c^8*d^2*x^2 + 10*b^5*c^9*d*x + b^5*c^10)*log(F
)^5 - 5*(b^4*d^8*x^8 + 8*b^4*c*d^7*x^7 + 28*b^4*c^2*d^6*x^6 + 56*b^4*c^3*d^
5*x^5 + 70*b^4*c^4*d^4*x^4 + 56*b^4*c^5*d^3*x^3 + 28*b^4*c^6*d^2*x^2 + 8*b^
4*c^7*d*x + b^4*c^8)*log(F)^4 + 20*(b^3*d^6*x^6 + 6*b^3*c*d^5*x^5 + 15*b^3*
c^2*d^4*x^4 + 20*b^3*c^3*d^3*x^3 + 15*b^3*c^4*d^2*x^2 + 6*b^3*c^5*d*x + b^3
*c^6)*log(F)^3 - 60*(b^2*d^4*x^4 + 4*b^2*c*d^3*x^3 + 6*b^2*c^2*d^2*x^2 + 4*
b^2*c^3*d*x + b^2*c^4)*log(F)^2 + 120*(b*d^2*x^2 + 2*b*c*d*x + b*c^2)*log(F
) - 120)*F^(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a)/(b^6*d*log(F)^6)
```

giac [A] time = 0.34, size = 145, normalized size = 1.38

$$\frac{\left(b^5d^{10}\left(x + \frac{c}{d}\right)^{10}\log(F)^5 - 5\,b^4d^8\left(x + \frac{c}{d}\right)^8\log(F)^4 + 20\,b^3d^6\left(x + \frac{c}{d}\right)^6\log(F)^3 - 60\,b^2d^4\left(x + \frac{c}{d}\right)^4\log(F)^2 + 120\,bd^2\right.}{2\,b^6d\log(F)^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^11,x, algorithm="giac")
```

```
[Out] 1/2*(b^5*d^10*(x + c/d)^10*log(F)^5 - 5*b^4*d^8*(x + c/d)^8*log(F)^4 + 20*b
^3*d^6*(x + c/d)^6*log(F)^3 - 60*b^2*d^4*(x + c/d)^4*log(F)^2 + 120*b*d^2*(
x + c/d)^2*log(F) - 120)*e^(b*d^2*x^2*log(F) + 2*b*c*d*x*log(F) + b*c^2*log
(F) + a*log(F))/(b^6*d*log(F)^6)
```

maple [B] time = 0.02, size = 579, normalized size = 5.51

$$\frac{\left(b^5d^{10}x^{10}\ln(F)^5 + 10b^5c\,d^9x^9\ln(F)^5 + 45b^5c^2d^8x^8\ln(F)^5 + 120b^5c^3d^7x^7\ln(F)^5 + 210b^5c^4d^6x^6\ln(F)^5 + 252b^5c^5d^5\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+(d*x+c)^2*b)*(d*x+c)^11,x)
```

```
[Out] 1/2*(-120+120*ln(F)*b*c^2+120*ln(F)*b*d^2*x^2+240*ln(F)*b*c*d*x+ln(F)^5*b^5
*c^10+20*ln(F)^3*b^3*c^6-60*ln(F)^2*b^2*c^4-5*ln(F)^4*b^4*c^8+d^10*x^10*b^5
*ln(F)^5-5*d^8*x^8*b^4*ln(F)^4+20*d^6*x^6*b^3*ln(F)^3-60*d^4*x^4*b^2*ln(F)^
2+400*ln(F)^3*b^3*c^3*d^3*x^3+300*ln(F)^3*b^3*c^4*d^2*x^2+120*ln(F)^3*b^3*c
^5*d*x-240*d^3*c*x^3*b^2*ln(F)^2-360*ln(F)^2*b^2*c^2*d^2*x^2-240*ln(F)^2*b^
2*c^3*d*x+252*ln(F)^5*b^5*c^5*d^5*x^5+210*ln(F)^5*b^5*c^6*d^4*x^4+120*ln(F)
^5*b^5*c^7*d^3*x^3-40*c*d^7*x^7*b^4*ln(F)^4+45*ln(F)^5*b^5*c^8*d^2*x^2-140*
ln(F)^4*b^4*c^2*d^6*x^6+10*ln(F)^5*b^5*c^9*d*x-280*ln(F)^4*b^4*c^3*d^5*x^5-
350*ln(F)^4*b^4*c^4*d^4*x^4-280*ln(F)^4*b^4*c^5*d^3*x^3-140*ln(F)^4*b^4*c^6
*d^2*x^2-40*ln(F)^4*b^4*c^7*d*x+120*c*d^5*x^5*b^3*ln(F)^3+300*ln(F)^3*b^3*c
^2*d^4*x^4+210*ln(F)^5*b^5*c^4*d^6*x^6+10*d^9*c*x^9*b^5*ln(F)^5+45*ln(F)^5*
b^5*c^2*d^8*x^8+120*ln(F)^5*b^5*c^3*d^7*x^7)*F^(b*d^2*x^2+2*b*c*d*x+b*c^2+a
)/b^6/ln(F)^6/d
```

maxima [C] time = 15.45, size = 5261, normalized size = 50.10

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^11,x, algorithm="maxima")
```

```
[Out] -11/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b*c*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)
/(b*d^2))) - 1)*log(F)^2/((b*log(F))^(3/2)*d^2*sqrt(-(b*d^2*x + b*c*d)^2*lo
g(F)/(b*d^2))) - F^((b*d^2*x + b*c*d)^2/(b*d^2))*b*log(F)/((b*log(F))^(3/2)
*d))*F^a*c^10/sqrt(b*log(F)) + 55/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b^2*c^2*(er
f(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^3/((b*log(F))^(5/2
)*d^3*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 2*F^((b*d^2*x + b*c*d)^2
/(b*d^2))*b^2*c*log(F)^2/((b*log(F))^(5/2)*d^2) - (b*d^2*x + b*c*d)^3*gamma
(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F))^(5/2)*d^5*(
-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)))*F^a*c^9*d/sqrt(b*log(F)) - 165
/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b^3*c^3*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F
)/(b*d^2))) - 1)*log(F)^4/((b*log(F))^(7/2)*d^4*sqrt(-(b*d^2*x + b*c*d)^2*l
og(F)/(b*d^2))) - 3*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^3*c^2*log(F)^3/((b*lo
g(F))^(7/2)*d^3) - 3*(b*d^2*x + b*c*d)^3*b*c*gamma(3/2, -(b*d^2*x + b*c*d)^
2*log(F)/(b*d^2))*log(F)^4/((b*log(F))^(7/2)*d^6*(-(b*d^2*x + b*c*d)^2*log(
F)/(b*d^2))^(3/2)) + b^2*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(
F)^2/((b*log(F))^(7/2)*d^3))*F^a*c^8*d^2/sqrt(b*log(F)) + 165*(sqrt(pi)*(b*
d^2*x + b*c*d)*b^4*c^4*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)
*log(F)^5/((b*log(F))^(9/2)*d^5*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2)))
- 4*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^4*c^3*log(F)^4/((b*log(F))^(9/2)*d^4)
 - 6*(b*d^2*x + b*c*d)^3*b^2*c^2*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*
d^2))*log(F)^5/((b*log(F))^(9/2)*d^7*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^
(3/2)) + 4*b^3*c*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b
```

*log(F))^(9/2)*d^4) - (b*d^2*x + b*c*d)^5*gamma(5/2, -(b*d^2*x + b*c*d)^2*l
og(F)/(b*d^2))*log(F)^5/((b*log(F))^(9/2)*d^9*(-(b*d^2*x + b*c*d)^2*log(F)/
(b*d^2))^(5/2)))*F^a*c^7*d^3/sqrt(b*log(F)) - 231*(sqrt(pi)*(b*d^2*x + b*c*
d)*b^5*c^5*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^6/((
b*log(F))^(11/2)*d^6*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 5*F^((b*d
^2*x + b*c*d)^2/(b*d^2))*b^5*c^4*log(F)^5/((b*log(F))^(11/2)*d^5) - 10*(b*d
^2*x + b*c*d)^3*b^3*c^3*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log
(F)^6/((b*log(F))^(11/2)*d^8*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) +
 10*b^4*c^2*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^4/((b*log(
F))^(11/2)*d^5) - b^3*gamma(3, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^
3/((b*log(F))^(11/2)*d^5) - 5*(b*d^2*x + b*c*d)^5*b*c*gamma(5/2, -(b*d^2*x
+ b*c*d)^2*log(F)/(b*d^2))*log(F)^6/((b*log(F))^(11/2)*d^10*(-(b*d^2*x + b*
c*d)^2*log(F)/(b*d^2))^(5/2)))*F^a*c^6*d^4/sqrt(b*log(F)) + 231*(sqrt(pi)*(
b*d^2*x + b*c*d)*b^6*c^6*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) -
1)*log(F)^7/((b*log(F))^(13/2)*d^7*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2)
)) - 6*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^6*c^5*log(F)^6/((b*log(F))^(13/2)*
d^6) - 15*(b*d^2*x + b*c*d)^3*b^4*c^4*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F
)/(b*d^2))*log(F)^7/((b*log(F))^(13/2)*d^9*(-(b*d^2*x + b*c*d)^2*log(F)/(b*
d^2))^(3/2)) + 20*b^5*c^3*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log
(F)^5/((b*log(F))^(13/2)*d^6) - 6*b^4*c*gamma(3, -(b*d^2*x + b*c*d)^2*log(F
)/(b*d^2))*log(F)^4/((b*log(F))^(13/2)*d^6) - 15*(b*d^2*x + b*c*d)^5*b^2*c^
2*gamma(5/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^7/((b*log(F))^(13/
2)*d^11*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(5/2)) - (b*d^2*x + b*c*d)^7*
gamma(7/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^7/((b*log(F))^(13/2)
d^13(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(7/2)))*F^a*c^5*d^5/sqrt(b*log(
F)) - 165*(sqrt(pi)*(b*d^2*x + b*c*d)*b^7*c^7*(erf(sqrt(-(b*d^2*x + b*c*d)^
2*log(F)/(b*d^2))) - 1)*log(F)^8/((b*log(F))^(15/2)*d^8*sqrt(-(b*d^2*x + b*
c*d)^2*log(F)/(b*d^2))) - 7*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^7*c^6*log(F)^
7/((b*log(F))^(15/2)*d^7) - 21*(b*d^2*x + b*c*d)^3*b^5*c^5*gamma(3/2, -(b*d
^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^8/((b*log(F))^(15/2)*d^10*(-(b*d^2*x
 + b*c*d)^2*log(F)/(b*d^2))^(3/2)) + 35*b^6*c^4*gamma(2, -(b*d^2*x + b*c*d)
^2*log(F)/(b*d^2))*log(F)^6/((b*log(F))^(15/2)*d^7) - 21*b^5*c^2*gamma(3, -
(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^5/((b*log(F))^(15/2)*d^7) - 35*(
b*d^2*x + b*c*d)^5*b^3*c^3*gamma(5/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*
log(F)^8/((b*log(F))^(15/2)*d^12*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(5/2
)) + b^4*gamma(4, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^4/((b*log(F))
^(15/2)*d^7) - 7*(b*d^2*x + b*c*d)^7*b*c*gamma(7/2, -(b*d^2*x + b*c*d)^2*lo
g(F)/(b*d^2))*log(F)^8/((b*log(F))^(15/2)*d^14*(-(b*d^2*x + b*c*d)^2*log(F)
/(b*d^2))^(7/2)))*F^a*c^4*d^6/sqrt(b*log(F)) + 165/2*(sqrt(pi)*(b*d^2*x + b
*c*d)*b^8*c^8*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^9
/((b*log(F))^(17/2)*d^9*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 8*F^((
b*d^2*x + b*c*d)^2/(b*d^2))*b^8*c^7*log(F)^8/((b*log(F))^(17/2)*d^8) - 28*(
b*d^2*x + b*c*d)^3*b^6*c^6*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*
log(F)^9/((b*log(F))^(17/2)*d^11*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2
)) + 56*b^7*c^5*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^7/((b*

log(F))^(17/2)*d^8) - 56*b^6*c^3*gamma(3, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^6/((b*log(F))^(17/2)*d^8) - 70*(b*d^2*x + b*c*d)^5*b^4*c^4*gamma(5/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^9/((b*log(F))^(17/2)*d^13*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(5/2)) + 8*b^5*c*gamma(4, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^5/((b*log(F))^(17/2)*d^8) - 28*(b*d^2*x + b*c*d)^7*b^2*c^2*gamma(7/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^9/((b*log(F))^(17/2)*d^15*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(7/2)) - (b*d^2*x + b*c*d)^9*gamma(9/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^9/((b*log(F))^(17/2)*d^17*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(9/2)))*F^a*c^3*d^7/sqrt(b*log(F)) - 55/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b^9*c^9*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^10/((b*log(F))^(19/2)*d^10*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 9*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^9*c^8*log(F)^9/((b*log(F))^(19/2)*d^9) - 36*(b*d^2*x + b*c*d)^3*b^7*c^7*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^10/((b*log(F))^(19/2)*d^12*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) + 84*b^8*c^6*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^8/((b*log(F))^(19/2)*d^9) - 126*b^7*c^4*gamma(3, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^7/((b*log(F))^(19/2)*d^9) - 126*(b*d^2*x + b*c*d)^5*b^5*c^5*gamma(5/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^10/((b*log(F))^(19/2)*d^14*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(5/2)) + 36*b^6*c^2*gamma(4, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^6/((b*log(F))^(19/2)*d^9) - 84*(b*d^2*x + b*c*d)^7*b^3*c^3*gamma(7/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^10/((b*log(F))^(19/2)*d^16*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(7/2)) - b^5*gamma(5, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^5/((b*log(F))^(19/2)*d^9) - 9*(b*d^2*x + b*c*d)^9*b*c*gamma(9/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^10/((b*log(F))^(19/2)*d^18*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(9/2)))*F^a*c^2*d^8/sqrt(b*log(F)) + 11/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b^10*c^10*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^11/((b*log(F))^(21/2)*d^11*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 10*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^10*c^9*log(F)^10/((b*log(F))^(21/2)*d^10) - 45*(b*d^2*x + b*c*d)^3*b^8*c^8*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^11/((b*log(F))^(21/2)*d^13*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) + 120*b^9*c^7*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^9/((b*log(F))^(21/2)*d^10) - 252*b^8*c^5*gamma(3, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^8/((b*log(F))^(21/2)*d^10) - 210*(b*d^2*x + b*c*d)^5*b^6*c^6*gamma(5/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^11/((b*log(F))^(21/2)*d^15*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(5/2)) + 120*b^7*c^3*gamma(4, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^7/((b*log(F))^(21/2)*d^10) - 210*(b*d^2*x + b*c*d)^7*b^4*c^4*gamma(7/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^11/((b*log(F))^(21/2)*d^17*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(7/2)) - 10*b^6*c*gamma(5, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^6/((b*log(F))^(21/2)*d^10) - 45*(b*d^2*x + b*c*d)^9*b^2*c^2*gamma(9/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^11/((b*log(F))^(21/2)*d^19*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(9/2)) - (b*d^2*x + b*c*d)^11*gamma(11/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^11/((b*log(F))^(21/2)*d^21*(-(b*d^2*x + b*c*d)^2*log(F

```
)/(b*d^2))^(11/2)))*F^a*c*d^9/sqrt(b*log(F)) - 1/2*(sqrt(pi)*(b*d^2*x + b*c
*d)*b^11*c^11*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^1
2/((b*log(F))^(23/2)*d^12*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 11*F
^((b*d^2*x + b*c*d)^2/(b*d^2))*b^11*c^10*log(F)^11/((b*log(F))^(23/2)*d^11)
 - 55*(b*d^2*x + b*c*d)^3*b^9*c^9*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b
*d^2))*log(F)^12/((b*log(F))^(23/2)*d^14*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^
2))^(3/2)) + 165*b^10*c^8*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log
(F)^10/((b*log(F))^(23/2)*d^11) - 462*b^9*c^6*gamma(3, -(b*d^2*x + b*c*d)^2
*log(F)/(b*d^2))*log(F)^9/((b*log(F))^(23/2)*d^11) - 330*(b*d^2*x + b*c*d)^
5*b^7*c^7*gamma(5/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^12/((b*log
(F))^(23/2)*d^16*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(5/2)) + 330*b^8*c^4
*gamma(4, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^8/((b*log(F))^(23/2)*
d^11) - 462*(b*d^2*x + b*c*d)^7*b^5*c^5*gamma(7/2, -(b*d^2*x + b*c*d)^2*log
(F)/(b*d^2))*log(F)^12/((b*log(F))^(23/2)*d^18*(-(b*d^2*x + b*c*d)^2*log(F)
/(b*d^2))^(7/2)) - 55*b^7*c^2*gamma(5, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))
*log(F)^7/((b*log(F))^(23/2)*d^11) - 165*(b*d^2*x + b*c*d)^9*b^3*c^3*gamma(
9/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^12/((b*log(F))^(23/2)*d^20
*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(9/2)) + b^6*gamma(6, -(b*d^2*x + b*
c*d)^2*log(F)/(b*d^2))*log(F)^6/((b*log(F))^(23/2)*d^11) - 11*(b*d^2*x + b*
c*d)^11*b*c*gamma(11/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^12/((b*
log(F))^(23/2)*d^22*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(11/2)))*F^a*d^10
/sqrt(b*log(F)) + 1/2*sqrt(pi)*F^(b*c^2 + a)*c^11*erf(sqrt(-b*log(F))*d*x -
 b*c*log(F)/sqrt(-b*log(F)))/(sqrt(-b*log(F))*F^(b*c^2)*d)
```

mupad [B] time = 4.15, size = 553, normalized size = 5.27

$$\frac{F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,\left(c^{10}+10\,c^9\,d\,x+45\,c^8\,d^2\,x^2+120\,c^7\,d^3\,x^3+210\,c^6\,d^4\,x^4+252\,c^5\,d^5\,x^5+210\,c^4\,d^6\,x^6+120\right.}{2\,b\,d\,\ln(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)*(c + d*x)^11,x)
```

```
[Out] (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*(c^10 + d^10*x^10 + 10*c*d^9*x^9
 + 45*c^8*d^2*x^2 + 120*c^7*d^3*x^3 + 210*c^6*d^4*x^4 + 252*c^5*d^5*x^5 + 2
10*c^4*d^6*x^6 + 120*c^3*d^7*x^7 + 45*c^2*d^8*x^8 + 10*c^9*d*x))/(2*b*d*log
(F)) - (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*(5*c^8 + 5*d^8*x^8 + 40*c
*d^7*x^7 + 140*c^6*d^2*x^2 + 280*c^5*d^3*x^3 + 350*c^4*d^4*x^4 + 280*c^3*d^
5*x^5 + 140*c^2*d^6*x^6 + 40*c^7*d*x))/(2*b^2*d*log(F)^2) - (F^(b*d^2*x^2)*
F^a*F^(b*c^2)*F^(2*b*c*d*x)*(60*c^4 + 60*d^4*x^4 + 240*c*d^3*x^3 + 360*c^2*
d^2*x^2 + 240*c^3*d*x))/(2*b^4*d*log(F)^4) - (60*F^(b*d^2*x^2)*F^a*F^(b*c^2
)*F^(2*b*c*d*x))/(b^6*d*log(F)^6) + (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d
*x)*(20*c^6 + 20*d^6*x^6 + 120*c*d^5*x^5 + 300*c^4*d^2*x^2 + 400*c^3*d^3*x^
3 + 300*c^2*d^4*x^4 + 120*c^5*d*x))/(2*b^3*d*log(F)^3) + (F^(b*d^2*x^2)*F^a
*F^(b*c^2)*F^(2*b*c*d*x)*(120*c^2 + 120*d^2*x^2 + 240*c*d*x))/(2*b^5*d*log(
F)^5)
```

sympy [A] time = 0.55, size = 796, normalized size = 7.58

$$\begin{cases} \frac{F^{a+b(c+dx)^2}\left(b^5c^{10}\log(F)^5+10b^5c^9dx\log(F)^5+45b^5c^8d^2x^2\log(F)^5+120b^5c^7d^3x^3\log(F)^5+210b^5c^6d^4x^4\log(F)^5+252b^5c^5d^5x^5\log(F)^5+210b^5c^4d^6x \right.}{} \\ c^{11}x+\frac{11c^{10}dx^2}{2}+\frac{55c^9d^2x^3}{3}+\frac{165c^8d^3x^4}{4}+66c^7d^4x^5+77c^6d^5x^6+66c^5d^6x^7+\frac{165c^4d^7x^8}{4}+\frac{55c^3d^8x^9}{3}+\frac{11c^2d^9x^{10}}{2}+cd^{10} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)*(d*x+c)**11,x)
```

```
[Out] Piecewise((F**(a + b*(c + d*x)**2)*(b**5*c**10*log(F)**5 + 10*b**5*c**9*d*x
*log(F)**5 + 45*b**5*c**8*d**2*x**2*log(F)**5 + 120*b**5*c**7*d**3*x**3*log
(F)**5 + 210*b**5*c**6*d**4*x**4*log(F)**5 + 252*b**5*c**5*d**5*x**5*log(F)
**5 + 210*b**5*c**4*d**6*x**6*log(F)**5 + 120*b**5*c**3*d**7*x**7*log(F)**5
 + 45*b**5*c**2*d**8*x**8*log(F)**5 + 10*b**5*c*d**9*x**9*log(F)**5 + b**5*
d**10*x**10*log(F)**5 - 5*b**4*c**8*log(F)**4 - 40*b**4*c**7*d*x*log(F)**4
- 140*b**4*c**6*d**2*x**2*log(F)**4 - 280*b**4*c**5*d**3*x**3*log(F)**4 - 3
50*b**4*c**4*d**4*x**4*log(F)**4 - 280*b**4*c**3*d**5*x**5*log(F)**4 - 140*
b**4*c**2*d**6*x**6*log(F)**4 - 40*b**4*c*d**7*x**7*log(F)**4 - 5*b**4*d**8
*x**8*log(F)**4 + 20*b**3*c**6*log(F)**3 + 120*b**3*c**5*d*x*log(F)**3 + 30
0*b**3*c**4*d**2*x**2*log(F)**3 + 400*b**3*c**3*d**3*x**3*log(F)**3 + 300*b
**3*c**2*d**4*x**4*log(F)**3 + 120*b**3*c*d**5*x**5*log(F)**3 + 20*b**3*d**
6*x**6*log(F)**3 - 60*b**2*c**4*log(F)**2 - 240*b**2*c**3*d*x*log(F)**2 - 3
60*b**2*c**2*d**2*x**2*log(F)**2 - 240*b**2*c*d**3*x**3*log(F)**2 - 60*b**2
*d**4*x**4*log(F)**2 + 120*b*c**2*log(F) + 240*b*c*d*x*log(F) + 120*b*d**2*
x**2*log(F) - 120)/(2*b**6*d*log(F)**6), Ne(2*b**6*d*log(F)**6, 0)), (c**11
*x + 11*c**10*d*x**2/2 + 55*c**9*d**2*x**3/3 + 165*c**8*d**3*x**4/4 + 66*c*
*7*d**4*x**5 + 77*c**6*d**5*x**6 + 66*c**5*d**6*x**7 + 165*c**4*d**7*x**8/4
 + 55*c**3*d**8*x**9/3 + 11*c**2*d**9*x**10/2 + c*d**10*x**11 + d**11*x**12
/12, True))
```

3.256 $\int F^{a+b(c+dx)^2}(c+dx)^9\,dx$

Optimal. Leaf size=88

$$\frac{F^{a+b(c+dx)^2}\left(b^4\log^4(F)(c+dx)^8-4b^3\log^3(F)(c+dx)^6+12b^2\log^2(F)(c+dx)^4-24b\log(F)(c+dx)^2+24\right)}{2b^5d\log^5(F)}$$

```
[Out] 1/2*F^(a+b*(d*x+c)^2)*(24-24*b*(d*x+c)^2*ln(F)+12*b^2*(d*x+c)^4*ln(F)^2-4*b
^3*(d*x+c)^6*ln(F)^3+b^4*(d*x+c)^8*ln(F)^4)/b^5/d/ln(F)^5
```

Rubi [C] time = 0.07, antiderivative size = 31, normalized size of antiderivative = 0.35, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2218}

$$\frac{F^a\text{Gamma}\left(5,-b\log(F)(c+dx)^2\right)}{2b^5d\log^5(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)*(c + d*x)^9,x]
```

```
[Out] (F^a*Gamma[5, -(b*(c + d*x)^2*Log[F])])/(2*b^5*d*Log[F]^5)
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+b(c+dx)^2}(c+dx)^9\,dx=\frac{F^a\Gamma\left(5,-b(c+dx)^2\log(F)\right)}{2b^5d\log^5(F)}$$

Mathematica [C] time = 0.01, size = 31, normalized size = 0.35

$$\frac{F^a\Gamma\left(5,-b(c+dx)^2\log(F)\right)}{2b^5d\log^5(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)*(c + d*x)^9,x]
```

```
[Out] (F^a*Gamma[5, -(b*(c + d*x)^2*Log[F])])/(2*b^5*d*Log[F]^5)
```

fricas [B] time = 0.43, size = 324, normalized size = 3.68

$$\frac{\left(\left(b^4d^8x^8 + 8\,b^4cd^7x^7 + 28\,b^4c^2d^6x^6 + 56\,b^4c^3d^5x^5 + 70\,b^4c^4d^4x^4 + 56\,b^4c^5d^3x^3 + 28\,b^4c^6d^2x^2 + 8\,b^4c^7dx + b^4c^8\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^9,x, algorithm="fricas")
```

```
[Out] 1/2*((b^4*d^8*x^8 + 8*b^4*c*d^7*x^7 + 28*b^4*c^2*d^6*x^6 + 56*b^4*c^3*d^5*x
^5 + 70*b^4*c^4*d^4*x^4 + 56*b^4*c^5*d^3*x^3 + 28*b^4*c^6*d^2*x^2 + 8*b^4*c
^7*d*x + b^4*c^8)*log(F)^4 - 4*(b^3*d^6*x^6 + 6*b^3*c*d^5*x^5 + 15*b^3*c^2*
d^4*x^4 + 20*b^3*c^3*d^3*x^3 + 15*b^3*c^4*d^2*x^2 + 6*b^3*c^5*d*x + b^3*c^6
)*log(F)^3 + 12*(b^2*d^4*x^4 + 4*b^2*c*d^3*x^3 + 6*b^2*c^2*d^2*x^2 + 4*b^2*
c^3*d*x + b^2*c^4)*log(F)^2 - 24*(b*d^2*x^2 + 2*b*c*d*x + b*c^2)*log(F) + 2
4)*F^(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a)/(b^5*d*log(F)^5)
```

giac [A] time = 0.36, size = 124, normalized size = 1.41

$$\frac{\left(b^4d^8\left(x + \frac{c}{d}\right)^8 \log(F)^4 - 4\,b^3d^6\left(x + \frac{c}{d}\right)^6 \log(F)^3 + 12\,b^2d^4\left(x + \frac{c}{d}\right)^4 \log(F)^2 - 24\,bd^2\left(x + \frac{c}{d}\right)^2 \log(F) + 24\right)e^{\left(bd^2x^2 \log\right.}}{2\,b^5d\log(F)^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^9,x, algorithm="giac")
```

```
[Out] 1/2*(b^4*d^8*(x + c/d)^8*log(F)^4 - 4*b^3*d^6*(x + c/d)^6*log(F)^3 + 12*b^2
*d^4*(x + c/d)^4*log(F)^2 - 24*b*d^2*(x + c/d)^2*log(F) + 24)*e^(b*d^2*x^2*
log(F) + 2*b*c*d*x*log(F) + b*c^2*log(F) + a*log(F))/(b^5*d*log(F)^5)
```

maple [B] time = 0.02, size = 396, normalized size = 4.50

$$\frac{\left(b^4d^8x^8 \ln(F)^4 + 8b^4c\,d^7x^7 \ln(F)^4 + 28b^4c^2d^6x^6 \ln(F)^4 + 56b^4c^3d^5x^5 \ln(F)^4 + 70b^4c^4d^4x^4 \ln(F)^4 + 56b^4c^5d^3x^3 \ln\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+(d*x+c)^2*b)*(d*x+c)^9,x)
```

```
[Out] 1/2*(24-24*b*c^2*ln(F)-24*b*d^2*x^2*ln(F)-48*b*c*d*x*ln(F)-4*b^3*c^6*ln(F)^
3+12*b^2*c^4*ln(F)^2+b^4*c^8*ln(F)^4+b^4*d^8*x^8*ln(F)^4-4*b^3*d^6*x^6*ln(F
)^3+12*b^2*d^4*x^4*ln(F)^2-80*b^3*c^3*d^3*x^3*ln(F)^3-60*b^3*c^4*d^2*x^2*ln
```

```
(F)^3-24*b^3*c^5*d*x*ln(F)^3+48*b^2*c*d^3*x^3*ln(F)^2+72*b^2*c^2*d^2*x^2*ln
(F)^2+48*b^2*c^3*d*x*ln(F)^2+8*b^4*c*d^7*x^7*ln(F)^4+28*b^4*c^2*d^6*x^6*ln(
F)^4+56*b^4*c^3*d^5*x^5*ln(F)^4+70*b^4*c^4*d^4*x^4*ln(F)^4+56*b^4*c^5*d^3*x
^3*ln(F)^4+28*b^4*c^6*d^2*x^2*ln(F)^4+8*b^4*c^7*d*x*ln(F)^4-24*b^3*c*d^5*x^
5*ln(F)^3-60*b^3*c^2*d^4*x^4*ln(F)^3)*F^(b*d^2*x^2+2*b*c*d*x+b*c^2+a)/b^5/l
n(F)^5/d
```

maxima [C] time = 14.67, size = 3727, normalized size = 42.35

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^9,x, algorithm="maxima")
```

```
[Out] -9/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b*c*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/
(b*d^2))) - 1)*log(F)^2/((b*log(F))^(3/2)*d^2*sqrt(-(b*d^2*x + b*c*d)^2*log
(F)/(b*d^2))) - F^((b*d^2*x + b*c*d)^2/(b*d^2))*b*log(F)/((b*log(F))^(3/2)*
d))*F^a*c^8/sqrt(b*log(F)) + 18*(sqrt(pi)*(b*d^2*x + b*c*d)*b^2*c^2*(erf(sq
rt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^3/((b*log(F))^(5/2)*d^
3*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 2*F^((b*d^2*x + b*c*d)^2/(b*
d^2))*b^2*c*log(F)^2/((b*log(F))^(5/2)*d^2) - (b*d^2*x + b*c*d)^3*gamma(3/2
, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F))^(5/2)*d^5*(-(b*
d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)))*F^a*c^7*d/sqrt(b*log(F)) - 42*(sqr
t(pi)*(b*d^2*x + b*c*d)*b^3*c^3*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^
2))) - 1)*log(F)^4/((b*log(F))^(7/2)*d^4*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(
b*d^2))) - 3*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^3*c^2*log(F)^3/((b*log(F))^(
7/2)*d^3) - 3*(b*d^2*x + b*c*d)^3*b*c*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F
)/(b*d^2))*log(F)^4/((b*log(F))^(7/2)*d^6*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d
^2))^(3/2)) + b^2*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^2/((
b*log(F))^(7/2)*d^3))*F^a*c^6*d^2/sqrt(b*log(F)) + 63*(sqrt(pi)*(b*d^2*x +
b*c*d)*b^4*c^4*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^
5/((b*log(F))^(9/2)*d^5*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 4*F^((
b*d^2*x + b*c*d)^2/(b*d^2))*b^4*c^3*log(F)^4/((b*log(F))^(9/2)*d^4) - 6*(b*
d^2*x + b*c*d)^3*b^2*c^2*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*lo
g(F)^5/((b*log(F))^(9/2)*d^7*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) +
 4*b^3*c*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F))
^(9/2)*d^4) - (b*d^2*x + b*c*d)^5*gamma(5/2, -(b*d^2*x + b*c*d)^2*log(F)/(b
*d^2))*log(F)^5/((b*log(F))^(9/2)*d^9*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))
^(5/2)))*F^a*c^5*d^3/sqrt(b*log(F)) - 63*(sqrt(pi)*(b*d^2*x + b*c*d)*b^5*c^
5*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^6/((b*log(F))
^(11/2)*d^6*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 5*F^((b*d^2*x + b*
c*d)^2/(b*d^2))*b^5*c^4*log(F)^5/((b*log(F))^(11/2)*d^5) - 10*(b*d^2*x + b*
c*d)^3*b^3*c^3*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^6/((b
*log(F))^(11/2)*d^8*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) + 10*b^4*c
^2*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^4/((b*log(F))^(11/2
```

)*d^5) - b^3*gamma(3, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log
(F))^(11/2)*d^5) - 5*(b*d^2*x + b*c*d)^5*b*c*gamma(5/2, -(b*d^2*x + b*c*d)^
2*log(F)/(b*d^2))*log(F)^6/((b*log(F))^(11/2)*d^10*(-(b*d^2*x + b*c*d)^2*lo
g(F)/(b*d^2))^(5/2)))*F^a*c^4*d^4/sqrt(b*log(F)) + 42*(sqrt(pi)*(b*d^2*x +
b*c*d)*b^6*c^6*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^
7/((b*log(F))^(13/2)*d^7*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 6*F^(
(b*d^2*x + b*c*d)^2/(b*d^2))*b^6*c^5*log(F)^6/((b*log(F))^(13/2)*d^6) - 15*
(b*d^2*x + b*c*d)^3*b^4*c^4*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))
*log(F)^7/((b*log(F))^(13/2)*d^9*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2
)) + 20*b^5*c^3*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^5/((b*
log(F))^(13/2)*d^6) - 6*b^4*c*gamma(3, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))
*log(F)^4/((b*log(F))^(13/2)*d^6) - 15*(b*d^2*x + b*c*d)^5*b^2*c^2*gamma(5/
2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^7/((b*log(F))^(13/2)*d^11*(-
(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(5/2)) - (b*d^2*x + b*c*d)^7*gamma(7/2,
 -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^7/((b*log(F))^(13/2)*d^13*(-(b
*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(7/2)))*F^a*c^3*d^5/sqrt(b*log(F)) - 18*(
sqrt(pi)*(b*d^2*x + b*c*d)*b^7*c^7*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b
*d^2))) - 1)*log(F)^8/((b*log(F))^(15/2)*d^8*sqrt(-(b*d^2*x + b*c*d)^2*log(
F)/(b*d^2))) - 7*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^7*c^6*log(F)^7/((b*log(F
))^(15/2)*d^7) - 21*(b*d^2*x + b*c*d)^3*b^5*c^5*gamma(3/2, -(b*d^2*x + b*c*
d)^2*log(F)/(b*d^2))*log(F)^8/((b*log(F))^(15/2)*d^10*(-(b*d^2*x + b*c*d)^2
*log(F)/(b*d^2))^(3/2)) + 35*b^6*c^4*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(
b*d^2))*log(F)^6/((b*log(F))^(15/2)*d^7) - 21*b^5*c^2*gamma(3, -(b*d^2*x +
b*c*d)^2*log(F)/(b*d^2))*log(F)^5/((b*log(F))^(15/2)*d^7) - 35*(b*d^2*x + b
*c*d)^5*b^3*c^3*gamma(5/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^8/((
b*log(F))^(15/2)*d^12*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(5/2)) + b^4*ga
mma(4, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^4/((b*log(F))^(15/2)*d^7
) - 7*(b*d^2*x + b*c*d)^7*b*c*gamma(7/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2
))*log(F)^8/((b*log(F))^(15/2)*d^14*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(
7/2)))*F^a*c^2*d^6/sqrt(b*log(F)) + 9/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b^8*c^8
*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^9/((b*log(F))^
(17/2)*d^9*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 8*F^((b*d^2*x + b*c
*d)^2/(b*d^2))*b^8*c^7*log(F)^8/((b*log(F))^(17/2)*d^8) - 28*(b*d^2*x + b*c
*d)^3*b^6*c^6*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^9/((b*
log(F))^(17/2)*d^11*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) + 56*b^7*c
^5*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^7/((b*log(F))^(17/2
)*d^8) - 56*b^6*c^3*gamma(3, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^6/
((b*log(F))^(17/2)*d^8) - 70*(b*d^2*x + b*c*d)^5*b^4*c^4*gamma(5/2, -(b*d^2
*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^9/((b*log(F))^(17/2)*d^13*(-(b*d^2*x +
 b*c*d)^2*log(F)/(b*d^2))^(5/2)) + 8*b^5*c*gamma(4, -(b*d^2*x + b*c*d)^2*lo
g(F)/(b*d^2))*log(F)^5/((b*log(F))^(17/2)*d^8) - 28*(b*d^2*x + b*c*d)^7*b^2
*c^2*gamma(7/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^9/((b*log(F))^(
17/2)*d^15*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(7/2)) - (b*d^2*x + b*c*d)
^9*gamma(9/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^9/((b*log(F))^(17
/2)*d^17*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(9/2)))*F^a*c*d^7/sqrt(b*log

```
(F)) - 1/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b^9*c^9*(erf(sqrt(-(b*d^2*x + b*c*d)
^2*log(F)/(b*d^2))) - 1)*log(F)^10/((b*log(F))^(19/2)*d^10*sqrt(-(b*d^2*x +
 b*c*d)^2*log(F)/(b*d^2))) - 9*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^9*c^8*log(
F)^9/((b*log(F))^(19/2)*d^9) - 36*(b*d^2*x + b*c*d)^3*b^7*c^7*gamma(3/2, -(
b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^10/((b*log(F))^(19/2)*d^12*(-(b*d
^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) + 84*b^8*c^6*gamma(2, -(b*d^2*x + b*
c*d)^2*log(F)/(b*d^2))*log(F)^8/((b*log(F))^(19/2)*d^9) - 126*b^7*c^4*gamma
(3, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^7/((b*log(F))^(19/2)*d^9) -
 126*(b*d^2*x + b*c*d)^5*b^5*c^5*gamma(5/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*
d^2))*log(F)^10/((b*log(F))^(19/2)*d^14*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2
))^(5/2)) + 36*b^6*c^2*gamma(4, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)
^6/((b*log(F))^(19/2)*d^9) - 84*(b*d^2*x + b*c*d)^7*b^3*c^3*gamma(7/2, -(b*
d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^10/((b*log(F))^(19/2)*d^16*(-(b*d^2
*x + b*c*d)^2*log(F)/(b*d^2))^(7/2)) - b^5*gamma(5, -(b*d^2*x + b*c*d)^2*lo
g(F)/(b*d^2))*log(F)^5/((b*log(F))^(19/2)*d^9) - 9*(b*d^2*x + b*c*d)^9*b*c*
gamma(9/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^10/((b*log(F))^(19/2
)*d^18*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(9/2)))*F^a*d^8/sqrt(b*log(F))
 + 1/2*sqrt(pi)*F^(b*c^2 + a)*c^9*erf(sqrt(-b*log(F))*d*x - b*c*log(F)/sqrt
(-b*log(F)))/(sqrt(-b*log(F))*F^(b*c^2)*d)
```

mupad [B] time = 3.94, size = 391, normalized size = 4.44

$$12\,F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}-\frac{F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,b^3\,\ln(F)^3\left(4\,c^6+24\,c^5\,d\,x+60\,c^4\,d^2\,x^2+80\,c^3\,d^3\,x^3+60\,c^2\,d^4\,x^4+24\,c\,d^5\,x^5+4\,d^6\,x^6\right)}{2}+\frac{F^{b\,d^2\,x^2}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)*(c + d*x)^9,x)
```

```
[Out] (12*F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x) - (F^(b*d^2*x^2)*F^a*F^(b*c^2
)*F^(2*b*c*d*x)*b^3*log(F)^3*(4*c^6 + 4*d^6*x^6 + 24*c*d^5*x^5 + 60*c^4*d^2
*x^2 + 80*c^3*d^3*x^3 + 60*c^2*d^4*x^4 + 24*c^5*d*x))/2 + (F^(b*d^2*x^2)*F^
a*F^(b*c^2)*F^(2*b*c*d*x)*b^4*log(F)^4*(c^8 + d^8*x^8 + 8*c*d^7*x^7 + 28*c^
6*d^2*x^2 + 56*c^5*d^3*x^3 + 70*c^4*d^4*x^4 + 56*c^3*d^5*x^5 + 28*c^2*d^6*x
^6 + 8*c^7*d*x))/2 - (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*b*log(F)*(2
4*c^2 + 24*d^2*x^2 + 48*c*d*x))/2 + (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d
*x)*b^2*log(F)^2*(12*c^4 + 12*d^4*x^4 + 48*c*d^3*x^3 + 72*c^2*d^2*x^2 + 48*
c^3*d*x))/2)/(b^5*d*log(F)^5)
```

sympy [A] time = 0.43, size = 558, normalized size = 6.34

$$\begin{cases}\frac{F^{a+b(c+dx)^2}\left(b^4c^8\log(F)^4+8b^4c^7dx\log(F)^4+28b^4c^6d^2x^2\log(F)^4+56b^4c^5d^3x^3\log(F)^4+70b^4c^4d^4x^4\log(F)^4+56b^4c^3d^5x^5\log(F)^4+28b^4c^2d^6x^6\log(F)^4\right.}{} \\ c^9x+\frac{9c^8dx^2}{2}+12c^7d^2x^3+21c^6d^3x^4+\frac{126c^5d^4x^5}{5}+21c^4d^5x^6+12c^3d^6x^7+\frac{9c^2d^7x^8}{2}+cd^8x^9+\frac{d^9x^{10}}{10}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)*(d*x+c)**9,x)
```

```
[Out] Piecewise((F**(a + b*(c + d*x)**2)*(b**4*c**8*log(F)**4 + 8*b**4*c**7*d*x*l
og(F)**4 + 28*b**4*c**6*d**2*x**2*log(F)**4 + 56*b**4*c**5*d**3*x**3*log(F)
**4 + 70*b**4*c**4*d**4*x**4*log(F)**4 + 56*b**4*c**3*d**5*x**5*log(F)**4 +
 28*b**4*c**2*d**6*x**6*log(F)**4 + 8*b**4*c*d**7*x**7*log(F)**4 + b**4*d**
8*x**8*log(F)**4 - 4*b**3*c**6*log(F)**3 - 24*b**3*c**5*d*x*log(F)**3 - 60*
b**3*c**4*d**2*x**2*log(F)**3 - 80*b**3*c**3*d**3*x**3*log(F)**3 - 60*b**3*
c**2*d**4*x**4*log(F)**3 - 24*b**3*c*d**5*x**5*log(F)**3 - 4*b**3*d**6*x**6
*log(F)**3 + 12*b**2*c**4*log(F)**2 + 48*b**2*c**3*d*x*log(F)**2 + 72*b**2*
c**2*d**2*x**2*log(F)**2 + 48*b**2*c*d**3*x**3*log(F)**2 + 12*b**2*d**4*x**
4*log(F)**2 - 24*b*c**2*log(F) - 48*b*c*d*x*log(F) - 24*b*d**2*x**2*log(F)
+ 24)/(2*b**5*d*log(F)**5), Ne(2*b**5*d*log(F)**5, 0)), (c**9*x + 9*c**8*d*
x**2/2 + 12*c**7*d**2*x**3 + 21*c**6*d**3*x**4 + 126*c**5*d**4*x**5/5 + 21*
c**4*d**5*x**6 + 12*c**3*d**6*x**7 + 9*c**2*d**7*x**8/2 + c*d**8*x**9 + d**
9*x**10/10, True))
```

3.257 $\int F^{a+b(c+dx)^2}(c+dx)^7\,dx$

Optimal. Leaf size=126

$$-\frac{3F^{a+b(c+dx)^2}}{b^4d\log^4(F)}+\frac{3(c+dx)^2F^{a+b(c+dx)^2}}{b^3d\log^3(F)}-\frac{3(c+dx)^4F^{a+b(c+dx)^2}}{2b^2d\log^2(F)}+\frac{(c+dx)^6F^{a+b(c+dx)^2}}{2bd\log(F)}$$

```
[Out] -3*F^(a+b*(d*x+c)^2)/b^4/d/ln(F)^4+3*F^(a+b*(d*x+c)^2)*(d*x+c)^2/b^3/d/ln(F
)^3-3/2*F^(a+b*(d*x+c)^2)*(d*x+c)^4/b^2/d/ln(F)^2+1/2*F^(a+b*(d*x+c)^2)*(d*
x+c)^6/b/d/ln(F)
```

Rubi [A] time = 0.26, antiderivative size = 126, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2212, 2209}

$$-\frac{3(c+dx)^4F^{a+b(c+dx)^2}}{2b^2d\log^2(F)}+\frac{3(c+dx)^2F^{a+b(c+dx)^2}}{b^3d\log^3(F)}-\frac{3F^{a+b(c+dx)^2}}{b^4d\log^4(F)}+\frac{(c+dx)^6F^{a+b(c+dx)^2}}{2bd\log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)*(c + d*x)^7,x]
```

```
[Out] (-3*F^(a + b*(c + d*x)^2))/(b^4*d*Log[F]^4) + (3*F^(a + b*(c + d*x)^2)*(c +
 d*x)^2)/(b^3*d*Log[F]^3) - (3*F^(a + b*(c + d*x)^2)*(c + d*x)^4)/(2*b^2*d*
Log[F]^2) + (F^(a + b*(c + d*x)^2)*(c + d*x)^6)/(2*b*d*Log[F])
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int F^{a+b(c+dx)^2}(c+dx)^7\,dx = \frac{F^{a+b(c+dx)^2}(c+dx)^6}{2bd\log(F)} - \frac{3\int F^{a+b(c+dx)^2}(c+dx)^5\,dx}{b\log(F)}$$
$$= -\frac{3F^{a+b(c+dx)^2}(c+dx)^4}{2b^2d\log^2(F)} + \frac{F^{a+b(c+dx)^2}(c+dx)^6}{2bd\log(F)} + \frac{6\int F^{a+b(c+dx)^2}(c+dx)^3\,dx}{b^2\log^2(F)}$$
$$= \frac{3F^{a+b(c+dx)^2}(c+dx)^2}{b^3d\log^3(F)} - \frac{3F^{a+b(c+dx)^2}(c+dx)^4}{2b^2d\log^2(F)} + \frac{F^{a+b(c+dx)^2}(c+dx)^6}{2bd\log(F)} - \frac{6\int F^{a+b(c+dx)}}{b^3\log}$$
$$= -\frac{3F^{a+b(c+dx)^2}}{b^4d\log^4(F)} + \frac{3F^{a+b(c+dx)^2}(c+dx)^2}{b^3d\log^3(F)} - \frac{3F^{a+b(c+dx)^2}(c+dx)^4}{2b^2d\log^2(F)} + \frac{F^{a+b(c+dx)^2}(c+dx)^6}{2bd\log(F)}$$

Mathematica [A] time = 0.04, size = 72, normalized size = 0.57

$$\frac{F^{a+b(c+dx)^2}\left(b^3\log^3(F)(c+dx)^6 - 3b^2\log^2(F)(c+dx)^4 + 6b\log(F)(c+dx)^2 - 6\right)}{2b^4d\log^4(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)*(c + d*x)^7,x]
```

```
[Out] (F^(a + b*(c + d*x)^2)*(-6 + 6*b*(c + d*x)^2*Log[F] - 3*b^2*(c + d*x)^4*Log
[F]^2 + b^3*(c + d*x)^6*Log[F]^3))/(2*b^4*d*Log[F]^4)
```

fricas [A] time = 0.41, size = 208, normalized size = 1.65

$$\frac{\left(\left(b^3d^6x^6 + 6\,b^3cd^5x^5 + 15\,b^3c^2d^4x^4 + 20\,b^3c^3d^3x^3 + 15\,b^3c^4d^2x^2 + 6\,b^3c^5dx + b^3c^6\right)\log(F)^3 - 3\left(b^2d^4x^4 + 4\,b^2c\right.\right.}{2\,b^4d\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^7,x, algorithm="fricas")
```

```
[Out] 1/2*((b^3*d^6*x^6 + 6*b^3*c*d^5*x^5 + 15*b^3*c^2*d^4*x^4 + 20*b^3*c^3*d^3*x
^3 + 15*b^3*c^4*d^2*x^2 + 6*b^3*c^5*d*x + b^3*c^6)*log(F)^3 - 3*(b^2*d^4*x^
4 + 4*b^2*c*d^3*x^3 + 6*b^2*c^2*d^2*x^2 + 4*b^2*c^3*d*x + b^2*c^4)*log(F)^2
 + 6*(b*d^2*x^2 + 2*b*c*d*x + b*c^2)*log(F) - 6)*F^(b*d^2*x^2 + 2*b*c*d*x +
 b*c^2 + a)/(b^4*d*log(F)^4)
```

giac [A] time = 0.31, size = 103, normalized size = 0.82

$$\frac{\left(b^3d^6\left(x+\frac{c}{d}\right)^6\log(F)^3 - 3\,b^2d^4\left(x+\frac{c}{d}\right)^4\log(F)^2 + 6\,bd^2\left(x+\frac{c}{d}\right)^2\log(F) - 6\right)e^{\left(bd^2x^2\log(F) + 2\,bcdx\log(F) + bc^2\log(F) + a\log\right.}}{2\,b^4d\log(F)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^7,x, algorithm="giac")
```

```
[Out] 1/2*(b^3*d^6*(x + c/d)^6*log(F)^3 - 3*b^2*d^4*(x + c/d)^4*log(F)^2 + 6*b*d^
2*(x + c/d)^2*log(F) - 6)*e^(b*d^2*x^2*log(F) + 2*b*c*d*x*log(F) + b*c^2*lo
g(F) + a*log(F))/(b^4*d*log(F)^4)
```

maple [B] time = 0.01, size = 249, normalized size = 1.98

$$\frac{\left(b^3d^6x^6\ln(F)^3 + 6b^3c\,d^5x^5\ln(F)^3 + 15b^3c^2d^4x^4\ln(F)^3 + 20b^3c^3d^3x^3\ln(F)^3 + 15b^3c^4d^2x^2\ln(F)^3 + 6b^3c^5dx\ln(F)^3\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+(d*x+c)^2*b)*(d*x+c)^7,x)
```

```
[Out] 1/2*(b^3*d^6*x^6*ln(F)^3+6*b^3*c*d^5*x^5*ln(F)^3+15*b^3*c^2*d^4*x^4*ln(F)^3
+20*b^3*c^3*d^3*x^3*ln(F)^3+15*b^3*c^4*d^2*x^2*ln(F)^3+6*b^3*c^5*d*x*ln(F)^
3+b^3*c^6*ln(F)^3-3*b^2*d^4*x^4*ln(F)^2-12*b^2*c*d^3*x^3*ln(F)^2-18*b^2*c^2
*d^2*x^2*ln(F)^2-12*b^2*c^3*d*x*ln(F)^2-3*b^2*c^4*ln(F)^2+6*b*d^2*x^2*ln(F)
+12*b*c*d*x*ln(F)+6*b*c^2*ln(F)-6)*F^(b*d^2*x^2+2*b*c*d*x+b*c^2+a)/ln(F)^4/
b^4/d
```

maxima [C] time = 10.24, size = 2452, normalized size = 19.46

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^7,x, algorithm="maxima")
```

```
[Out] -7/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b*c*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/
(b*d^2))) - 1)*log(F)^2/((b*log(F))^(3/2)*d^2*sqrt(-(b*d^2*x + b*c*d)^2*log
(F)/(b*d^2))) - F^((b*d^2*x + b*c*d)^2/(b*d^2))*b*log(F)/((b*log(F))^(3/2)*
d))*F^a*c^6/sqrt(b*log(F)) + 21/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b^2*c^2*(erf(
sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^3/((b*log(F))^(5/2)*
d^3*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 2*F^((b*d^2*x + b*c*d)^2/(
b*d^2))*b^2*c*log(F)^2/((b*log(F))^(5/2)*d^2) - (b*d^2*x + b*c*d)^3*gamma(3
/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F))^(5/2)*d^5*(-(
b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)))*F^a*c^5*d/sqrt(b*log(F)) - 35/2*
(sqrt(pi)*(b*d^2*x + b*c*d)*b^3*c^3*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(
b*d^2))) - 1)*log(F)^4/((b*log(F))^(7/2)*d^4*sqrt(-(b*d^2*x + b*c*d)^2*log(
F)/(b*d^2))) - 3*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^3*c^2*log(F)^3/((b*log(F
))^(7/2)*d^3) - 3*(b*d^2*x + b*c*d)^3*b*c*gamma(3/2, -(b*d^2*x + b*c*d)^2*l
og(F)/(b*d^2))*log(F)^4/((b*log(F))^(7/2)*d^6*(-(b*d^2*x + b*c*d)^2*log(F)/
(b*d^2))^(3/2)) + b^2*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^
```

```
2/((b*log(F))^(7/2)*d^3))*F^a*c^4*d^2/sqrt(b*log(F)) + 35/2*(sqrt(pi)*(b*d^
2*x + b*c*d)*b^4*c^4*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*l
og(F)^5/((b*log(F))^(9/2)*d^5*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) -
4*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^4*c^3*log(F)^4/((b*log(F))^(9/2)*d^4) -
 6*(b*d^2*x + b*c*d)^3*b^2*c^2*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^
2))*log(F)^5/((b*log(F))^(9/2)*d^7*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3
/2)) + 4*b^3*c*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*l
og(F))^(9/2)*d^4) - (b*d^2*x + b*c*d)^5*gamma(5/2, -(b*d^2*x + b*c*d)^2*log
(F)/(b*d^2))*log(F)^5/((b*log(F))^(9/2)*d^9*(-(b*d^2*x + b*c*d)^2*log(F)/(b
*d^2))^(5/2)))*F^a*c^3*d^3/sqrt(b*log(F)) - 21/2*(sqrt(pi)*(b*d^2*x + b*c*d
)*b^5*c^5*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^6/((b
*log(F))^(11/2)*d^6*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 5*F^((b*d^
2*x + b*c*d)^2/(b*d^2))*b^5*c^4*log(F)^5/((b*log(F))^(11/2)*d^5) - 10*(b*d^
2*x + b*c*d)^3*b^3*c^3*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(
F)^6/((b*log(F))^(11/2)*d^8*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) +
10*b^4*c^2*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^4/((b*log(F
))^(11/2)*d^5) - b^3*gamma(3, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3
/((b*log(F))^(11/2)*d^5) - 5*(b*d^2*x + b*c*d)^5*b*c*gamma(5/2, -(b*d^2*x +
 b*c*d)^2*log(F)/(b*d^2))*log(F)^6/((b*log(F))^(11/2)*d^10*(-(b*d^2*x + b*c
*d)^2*log(F)/(b*d^2))^(5/2)))*F^a*c^2*d^4/sqrt(b*log(F)) + 7/2*(sqrt(pi)*(b
*d^2*x + b*c*d)*b^6*c^6*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1
)*log(F)^7/((b*log(F))^(13/2)*d^7*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))
) - 6*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^6*c^5*log(F)^6/((b*log(F))^(13/2)*d
^6) - 15*(b*d^2*x + b*c*d)^3*b^4*c^4*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)
/(b*d^2))*log(F)^7/((b*log(F))^(13/2)*d^9*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d
^2))^(3/2)) + 20*b^5*c^3*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(
F)^5/((b*log(F))^(13/2)*d^6) - 6*b^4*c*gamma(3, -(b*d^2*x + b*c*d)^2*log(F)
/(b*d^2))*log(F)^4/((b*log(F))^(13/2)*d^6) - 15*(b*d^2*x + b*c*d)^5*b^2*c^2
*gamma(5/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^7/((b*log(F))^(13/2
)*d^11*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(5/2)) - (b*d^2*x + b*c*d)^7*g
amma(7/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^7/((b*log(F))^(13/2)*
d^13*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(7/2)))*F^a*c*d^5/sqrt(b*log(F))
 - 1/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b^7*c^7*(erf(sqrt(-(b*d^2*x + b*c*d)^2*l
og(F)/(b*d^2))) - 1)*log(F)^8/((b*log(F))^(15/2)*d^8*sqrt(-(b*d^2*x + b*c*d
)^2*log(F)/(b*d^2))) - 7*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^7*c^6*log(F)^7/(
(b*log(F))^(15/2)*d^7) - 21*(b*d^2*x + b*c*d)^3*b^5*c^5*gamma(3/2, -(b*d^2*
x + b*c*d)^2*log(F)/(b*d^2))*log(F)^8/((b*log(F))^(15/2)*d^10*(-(b*d^2*x +
b*c*d)^2*log(F)/(b*d^2))^(3/2)) + 35*b^6*c^4*gamma(2, -(b*d^2*x + b*c*d)^2*
log(F)/(b*d^2))*log(F)^6/((b*log(F))^(15/2)*d^7) - 21*b^5*c^2*gamma(3, -(b*
d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^5/((b*log(F))^(15/2)*d^7) - 35*(b*d
^2*x + b*c*d)^5*b^3*c^3*gamma(5/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log
(F)^8/((b*log(F))^(15/2)*d^12*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(5/2))
+ b^4*gamma(4, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^4/((b*log(F))^(1
5/2)*d^7) - 7*(b*d^2*x + b*c*d)^7*b*c*gamma(7/2, -(b*d^2*x + b*c*d)^2*log(F
)/(b*d^2))*log(F)^8/((b*log(F))^(15/2)*d^14*(-(b*d^2*x + b*c*d)^2*log(F)/(b
```

```
*d^2))^(7/2)))*F^a*d^6/sqrt(b*log(F)) + 1/2*sqrt(pi)*F^(b*c^2 + a)*c^7*erf(
sqrt(-b*log(F))*d*x - b*c*log(F)/sqrt(-b*log(F)))/(sqrt(-b*log(F))*F^(b*c^2
)*d)
```

mupad [B] time = 3.82, size = 253, normalized size = 2.01

$$\frac{F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,\left(b^3\,c^6\,\ln(F)^3+6\,b^3\,c^5\,d\,x\,\ln(F)^3+15\,b^3\,c^4\,d^2\,x^2\,\ln(F)^3+20\,b^3\,c^3\,d^3\,x^3\,\ln(F)^3+15\,b^3\,c^2\,d^4\,x\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)*(c + d*x)^7,x)
```

```
[Out] (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*(6*b*c^2*log(F) - 3*b^2*c^4*log(
F)^2 + b^3*c^6*log(F)^3 + 6*b*d^2*x^2*log(F) - 3*b^2*d^4*x^4*log(F)^2 + b^3
*d^6*x^6*log(F)^3 - 12*b^2*c*d^3*x^3*log(F)^2 + 6*b^3*c*d^5*x^5*log(F)^3 -
18*b^2*c^2*d^2*x^2*log(F)^2 + 15*b^3*c^4*d^2*x^2*log(F)^3 + 20*b^3*c^3*d^3*
x^3*log(F)^3 + 15*b^3*c^2*d^4*x^4*log(F)^3 + 12*b*c*d*x*log(F) - 12*b^2*c^3
*d*x*log(F)^2 + 6*b^3*c^5*d*x*log(F)^3 - 6))/(2*b^4*d*log(F)^4)
```

sympy [A] time = 0.34, size = 366, normalized size = 2.90

$$\begin{cases} \frac{F^{a+b(c+dx)^2}\left(b^3c^6\log{(F)}^3+6b^3c^5dx\log{(F)}^3+15b^3c^4d^2x^2\log{(F)}^3+20b^3c^3d^3x^3\log{(F)}^3+15b^3c^2d^4x^4\log{(F)}^3+6b^3cd^5x^5\log{(F)}^3+b^3d^6x^6\log{(F)}^3-3b^2c\right.}{2b^4d\log{(F)}^4} \\ c^7x+\frac{7c^6dx^2}{2}+7c^5d^2x^3+\frac{35c^4d^3x^4}{4}+7c^3d^4x^5+\frac{7c^2d^5x^6}{2}+cd^6x^7+\frac{d^7x^8}{8} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)*(d*x+c)**7,x)
```

```
[Out] Piecewise((F**(a + b*(c + d*x)**2)*(b**3*c**6*log(F)**3 + 6*b**3*c**5*d*x*l
og(F)**3 + 15*b**3*c**4*d**2*x**2*log(F)**3 + 20*b**3*c**3*d**3*x**3*log(F)
**3 + 15*b**3*c**2*d**4*x**4*log(F)**3 + 6*b**3*c*d**5*x**5*log(F)**3 + b**
3*d**6*x**6*log(F)**3 - 3*b**2*c**4*log(F)**2 - 12*b**2*c**3*d*x*log(F)**2
- 18*b**2*c**2*d**2*x**2*log(F)**2 - 12*b**2*c*d**3*x**3*log(F)**2 - 3*b**2
*d**4*x**4*log(F)**2 + 6*b*c**2*log(F) + 12*b*c*d*x*log(F) + 6*b*d**2*x**2*
log(F) - 6)/(2*b**4*d*log(F)**4), Ne(2*b**4*d*log(F)**4, 0)), (c**7*x + 7*c
**6*d*x**2/2 + 7*c**5*d**2*x**3 + 35*c**4*d**3*x**4/4 + 7*c**3*d**4*x**5 +
7*c**2*d**5*x**6/2 + c*d**6*x**7 + d**7*x**8/8, True))
```

3.258 $\int F^{a+b(c+dx)^2}(c+dx)^5\,dx$

Optimal. Leaf size=91

$$\frac{F^{a+b(c+dx)^2}}{b^3d\log^3(F)}-\frac{(c+dx)^2F^{a+b(c+dx)^2}}{b^2d\log^2(F)}+\frac{(c+dx)^4F^{a+b(c+dx)^2}}{2bd\log(F)}$$

```
[Out] F^(a+b*(d*x+c)^2)/b^3/d/ln(F)^3-F^(a+b*(d*x+c)^2)*(d*x+c)^2/b^2/d/ln(F)^2+1
/2*F^(a+b*(d*x+c)^2)*(d*x+c)^4/b/d/ln(F)
```

Rubi [A] time = 0.18, antiderivative size = 91, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2212, 2209}

$$-\frac{(c+dx)^2F^{a+b(c+dx)^2}}{b^2d\log^2(F)}+\frac{F^{a+b(c+dx)^2}}{b^3d\log^3(F)}+\frac{(c+dx)^4F^{a+b(c+dx)^2}}{2bd\log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)*(c + d*x)^5,x]
```

```
[Out] F^(a + b*(c + d*x)^2)/(b^3*d*Log[F]^3) - (F^(a + b*(c + d*x)^2)*(c + d*x)^2
)/(b^2*d*Log[F]^2) + (F^(a + b*(c + d*x)^2)*(c + d*x)^4)/(2*b*d*Log[F])
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int F^{a+b(c+dx)^2}(c+dx)^5\,dx = \frac{F^{a+b(c+dx)^2}(c+dx)^4}{2bd\log(F)} - \frac{2\int F^{a+b(c+dx)^2}(c+dx)^3\,dx}{b\log(F)}$$
$$= -\frac{F^{a+b(c+dx)^2}(c+dx)^2}{b^2d\log^2(F)} + \frac{F^{a+b(c+dx)^2}(c+dx)^4}{2bd\log(F)} + \frac{2\int F^{a+b(c+dx)^2}(c+dx)\,dx}{b^2\log^2(F)}$$
$$= \frac{F^{a+b(c+dx)^2}}{b^3d\log^3(F)} - \frac{F^{a+b(c+dx)^2}(c+dx)^2}{b^2d\log^2(F)} + \frac{F^{a+b(c+dx)^2}(c+dx)^4}{2bd\log(F)}$$

Mathematica [A] time = 0.03, size = 56, normalized size = 0.62

$$\frac{F^{a+b(c+dx)^2}\left(b^2\log^2(F)(c+dx)^4 - 2b\log(F)(c+dx)^2 + 2\right)}{2b^3d\log^3(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)*(c + d*x)^5,x]
```

```
[Out] (F^(a + b*(c + d*x)^2)*(2 - 2*b*(c + d*x)^2*Log[F] + b^2*(c + d*x)^4*Log[F]
^2))/(2*b^3*d*Log[F]^3)
```

fricas [A] time = 0.43, size = 120, normalized size = 1.32

$$\frac{\left(\left(b^2d^4x^4 + 4\,b^2cd^3x^3 + 6\,b^2c^2d^2x^2 + 4\,b^2c^3dx + b^2c^4\right)\log(F)^2 - 2\left(bd^2x^2 + 2\,bcdx + bc^2\right)\log(F) + 2\right)F^{bd^2x^2+2\,bcdx+}}{2\,b^3d\log(F)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^5,x, algorithm="fricas")
```

```
[Out] 1/2*((b^2*d^4*x^4 + 4*b^2*c*d^3*x^3 + 6*b^2*c^2*d^2*x^2 + 4*b^2*c^3*d*x + b
^2*c^4)*log(F)^2 - 2*(b*d^2*x^2 + 2*b*c*d*x + b*c^2)*log(F) + 2)*F^(b*d^2*x
^2 + 2*b*c*d*x + b*c^2 + a)/(b^3*d*log(F)^3)
```

giac [A] time = 0.30, size = 82, normalized size = 0.90

$$\frac{\left(b^2d^4\left(x+\frac{c}{d}\right)^4\log(F)^2 - 2\,bd^2\left(x+\frac{c}{d}\right)^2\log(F) + 2\right)e^{\left(bd^2x^2\log(F) + 2\,bcdx\log(F) + bc^2\log(F) + a\log(F)\right)}}{2\,b^3d\log(F)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^5,x, algorithm="giac")
```

```
[Out] 1/2*(b^2*d^4*(x + c/d)^4*log(F)^2 - 2*b*d^2*(x + c/d)^2*log(F) + 2)*e^(b*d^
2*x^2*log(F) + 2*b*c*d*x*log(F) + b*c^2*log(F) + a*log(F))/(b^3*d*log(F)^3)
```

maple [A] time = 0.01, size = 138, normalized size = 1.52

$$\frac{\left(b^2d^4x^4\ln(F)^2 + 4b^2c\,d^3x^3\ln(F)^2 + 6b^2c^2d^2x^2\ln(F)^2 + 4b^2c^3dx\ln(F)^2 + b^2c^4\ln(F)^2 - 2b\,d^2x^2\ln(F) - 4bcdx\ln(\right.}{2b^3d\ln(F)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+(d*x+c)^2*b)*(d*x+c)^5,x)
```

```
[Out] 1/2*(b^2*d^4*x^4*ln(F)^2+4*b^2*c*d^3*x^3*ln(F)^2+6*b^2*c^2*d^2*x^2*ln(F)^2+
4*b^2*c^3*d*x*ln(F)^2+b^2*c^4*ln(F)^2-2*b*d^2*x^2*ln(F)-4*b*c*d*x*ln(F)-2*b
*c^2*ln(F)+2)*F^(b*d^2*x^2+2*b*c*d*x+b*c^2+a)/ln(F)^3/b^3/d
```

maxima [C] time = 6.92, size = 1438, normalized size = 15.80

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^5,x, algorithm="maxima")
```

```
[Out] -5/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b*c*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/
(b*d^2))) - 1)*log(F)^2/((b*log(F))^(3/2)*d^2*sqrt(-(b*d^2*x + b*c*d)^2*log
(F)/(b*d^2))) - F^((b*d^2*x + b*c*d)^2/(b*d^2))*b*log(F)/((b*log(F))^(3/2)*
d))*F^a*c^4/sqrt(b*log(F)) + 5*(sqrt(pi)*(b*d^2*x + b*c*d)*b^2*c^2*(erf(sqr
t(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^3/((b*log(F))^(5/2)*d^3
*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 2*F^((b*d^2*x + b*c*d)^2/(b*d
^2))*b^2*c*log(F)^2/((b*log(F))^(5/2)*d^2) - (b*d^2*x + b*c*d)^3*gamma(3/2,
 -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F))^(5/2)*d^5*(-(b*d
^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)))*F^a*c^3*d/sqrt(b*log(F)) - 5*(sqrt(
pi)*(b*d^2*x + b*c*d)*b^3*c^3*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2)
)) - 1)*log(F)^4/((b*log(F))^(7/2)*d^4*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*
d^2))) - 3*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^3*c^2*log(F)^3/((b*log(F))^(7/
2)*d^3) - 3*(b*d^2*x + b*c*d)^3*b*c*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/
(b*d^2))*log(F)^4/((b*log(F))^(7/2)*d^6*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2
))^(3/2)) + b^2*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^2/((b*
log(F))^(7/2)*d^3))*F^a*c^2*d^2/sqrt(b*log(F)) + 5/2*(sqrt(pi)*(b*d^2*x + b
*c*d)*b^4*c^4*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^5
/((b*log(F))^(9/2)*d^5*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 4*F^((b
*d^2*x + b*c*d)^2/(b*d^2))*b^4*c^3*log(F)^4/((b*log(F))^(9/2)*d^4) - 6*(b*d
^2*x + b*c*d)^3*b^2*c^2*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log
(F)^5/((b*log(F))^(9/2)*d^7*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) +
4*b^3*c*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F))^
```

```
(9/2)*d^4) - (b*d^2*x + b*c*d)^5*gamma(5/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*
d^2))*log(F)^5/((b*log(F))^(9/2)*d^9*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^
(5/2)))*F^a*c*d^3/sqrt(b*log(F)) - 1/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b^5*c^5*
(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^6/((b*log(F))^(
11/2)*d^6*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 5*F^((b*d^2*x + b*c*
d)^2/(b*d^2))*b^5*c^4*log(F)^5/((b*log(F))^(11/2)*d^5) - 10*(b*d^2*x + b*c*
d)^3*b^3*c^3*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^6/((b*l
og(F))^(11/2)*d^8*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) + 10*b^4*c^2
*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^4/((b*log(F))^(11/2)*
d^5) - b^3*gamma(3, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F
))^(11/2)*d^5) - 5*(b*d^2*x + b*c*d)^5*b*c*gamma(5/2, -(b*d^2*x + b*c*d)^2*
log(F)/(b*d^2))*log(F)^6/((b*log(F))^(11/2)*d^10*(-(b*d^2*x + b*c*d)^2*log(
F)/(b*d^2))^(5/2)))*F^a*d^4/sqrt(b*log(F)) + 1/2*sqrt(pi)*F^(b*c^2 + a)*c^5
*erf(sqrt(-b*log(F))*d*x - b*c*log(F)/sqrt(-b*log(F)))/(sqrt(-b*log(F))*F^(
b*c^2)*d)
```

mupad [B] time = 3.66, size = 142, normalized size = 1.56

$$\frac{F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,\left(b^2\,c^4\,\ln(F)^2+4\,b^2\,c^3\,d\,x\,\ln(F)^2+6\,b^2\,c^2\,d^2\,x^2\,\ln(F)^2+4\,b^2\,c\,d^3\,x^3\,\ln(F)^2+b^2\,d^4\,x^4\,\ln(F)^2\cdots\right.}{2\,b^3\,d\,\ln(F)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)*(c + d*x)^5,x)
```

```
[Out] (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*(b^2*c^4*log(F)^2 - 2*b*c^2*log(
F) - 2*b*d^2*x^2*log(F) + b^2*d^4*x^4*log(F)^2 + 4*b^2*c*d^3*x^3*log(F)^2 +
 6*b^2*c^2*d^2*x^2*log(F)^2 - 4*b*c*d*x*log(F) + 4*b^2*c^3*d*x*log(F)^2 + 2
))/(2*b^3*d*log(F)^3)
```

sympy [A] time = 0.26, size = 214, normalized size = 2.35

$$\begin{cases} \frac{F^{a+b(c+dx)^2}\left(b^2c^4\log{(F)}^2+4b^2c^3dx\log{(F)}^2+6b^2c^2d^2x^2\log{(F)}^2+4b^2cd^3x^3\log{(F)}^2+b^2d^4x^4\log{(F)}^2-2bc^2\log{(F)}-4bcdx\log{(F)}-2bd^2x^2\log{(F)}+2\right)}{2b^3d\log{(F)}^3} \\ c^5x+\frac{5c^4dx^2}{2}+\frac{10c^3d^2x^3}{3}+\frac{5c^2d^3x^4}{2}+cd^4x^5+\frac{d^5x^6}{6} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)*(d*x+c)**5,x)
```

```
[Out] Piecewise((F**(a + b*(c + d*x)**2)*(b**2*c**4*log(F)**2 + 4*b**2*c**3*d*x*l
og(F)**2 + 6*b**2*c**2*d**2*x**2*log(F)**2 + 4*b**2*c*d**3*x**3*log(F)**2 +
 b**2*d**4*x**4*log(F)**2 - 2*b*c**2*log(F) - 4*b*c*d*x*log(F) - 2*b*d**2*x
**2*log(F) + 2)/(2*b**3*d*log(F)**3), Ne(2*b**3*d*log(F)**3, 0)), (c**5*x +
```

```
5*c**4*d*x**2/2 + 10*c**3*d**2*x**3/3 + 5*c**2*d**3*x**4/2 + c*d**4*x**5 +
d**5*x**6/6, True))
```

3.259 $\int F^{a+b(c+dx)^2}(c+dx)^3\,dx$

Optimal. Leaf size=62

$$\frac{(c+dx)^2F^{a+b(c+dx)^2}}{2bd\log(F)}-\frac{F^{a+b(c+dx)^2}}{2b^2d\log^2(F)}$$

```
[Out] -1/2*F^(a+b*(d*x+c)^2)/b^2/d/ln(F)^2+1/2*F^(a+b*(d*x+c)^2)*(d*x+c)^2/b/d/ln
(F)
```

Rubi [A] time = 0.10, antiderivative size = 62, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2212, 2209}

$$\frac{(c+dx)^2F^{a+b(c+dx)^2}}{2bd\log(F)}-\frac{F^{a+b(c+dx)^2}}{2b^2d\log^2(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)*(c + d*x)^3,x]
```

```
[Out] -F^(a + b*(c + d*x)^2)/(2*b^2*d*Log[F]^2) + (F^(a + b*(c + d*x)^2)*(c + d*x
)^2)/(2*b*d*Log[F])
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int F^{a+b(c+dx)^2}(c+dx)^3\,dx = \frac{F^{a+b(c+dx)^2}(c+dx)^2}{2bd\log(F)} - \frac{\int F^{a+b(c+dx)^2}(c+dx)\,dx}{b\log(F)}$$
$$= -\frac{F^{a+b(c+dx)^2}}{2b^2d\log^2(F)} + \frac{F^{a+b(c+dx)^2}(c+dx)^2}{2bd\log(F)}$$

Mathematica [A] time = 0.02, size = 40, normalized size = 0.65

$$\frac{F^{a+b(c+dx)^2}\left(b\log(F)(c+dx)^2-1\right)}{2b^2d\log^2(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)*(c + d*x)^3,x]
```

```
[Out] (F^(a + b*(c + d*x)^2)*(-1 + b*(c + d*x)^2*Log[F]))/(2*b^2*d*Log[F]^2)
```

fricas [A] time = 0.45, size = 60, normalized size = 0.97

$$\frac{\left(\left(bd^2x^2+2\,bcdx+bc^2\right)\log(F)-1\right)F^{bd^2x^2+2\,bcdx+bc^2+a}}{2\,b^2d\log(F)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^3,x, algorithm="fricas")
```

```
[Out] 1/2*((b*d^2*x^2 + 2*b*c*d*x + b*c^2)*log(F) - 1)*F^(b*d^2*x^2 + 2*b*c*d*x +
 b*c^2 + a)/(b^2*d*log(F)^2)
```

giac [B] time = 0.35, size = 1186, normalized size = 19.13

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^3,x, algorithm="giac")
```

```
[Out] 1/2*(2*((pi*b^2*d^2*log(abs(F))*sgn(F) - pi*b^2*d^2*log(abs(F)))*(pi*b*c^2*
d*sgn(F) + pi*(d*x^2 + 2*c*x)*b*d^2*sgn(F) - pi*b*c^2*d - pi*(d*x^2 + 2*c*x
)*b*d^2)/((pi^2*b^2*d^2*sgn(F) - pi^2*b^2*d^2 + 2*b^2*d^2*log(abs(F))^2)^2
+ 4*(pi*b^2*d^2*log(abs(F))*sgn(F) - pi*b^2*d^2*log(abs(F)))^2) + (pi^2*b^2
*d^2*sgn(F) - pi^2*b^2*d^2 + 2*b^2*d^2*log(abs(F))^2)*(b*c^2*d*log(abs(F))
+ (d*x^2 + 2*c*x)*b*d^2*log(abs(F)) - d)/((pi^2*b^2*d^2*sgn(F) - pi^2*b^2*d
```

```
^2 + 2*b^2*d^2*log(abs(F))^2)^2 + 4*(pi*b^2*d^2*log(abs(F))*sgn(F) - pi*b^2
*d^2*log(abs(F)))^2))*cos(-1/2*pi*b*d^2*x^2*sgn(F) + 1/2*pi*b*d^2*x^2 - pi*
b*c*d*x*sgn(F) + pi*b*c*d*x - 1/2*pi*b*c^2*sgn(F) + 1/2*pi*b*c^2 - 1/2*pi*a
*sgn(F) + 1/2*pi*a) + ((pi^2*b^2*d^2*sgn(F) - pi^2*b^2*d^2 + 2*b^2*d^2*log(
abs(F))^2)*(pi*b*c^2*d*sgn(F) + pi*(d*x^2 + 2*c*x)*b*d^2*sgn(F) - pi*b*c^2*
d - pi*(d*x^2 + 2*c*x)*b*d^2)/((pi^2*b^2*d^2*sgn(F) - pi^2*b^2*d^2 + 2*b^2*
d^2*log(abs(F))^2)^2 + 4*(pi*b^2*d^2*log(abs(F))*sgn(F) - pi*b^2*d^2*log(ab
s(F)))^2) - 4*(pi*b^2*d^2*log(abs(F))*sgn(F) - pi*b^2*d^2*log(abs(F)))*(b*c
^2*d*log(abs(F)) + (d*x^2 + 2*c*x)*b*d^2*log(abs(F)) - d)/((pi^2*b^2*d^2*sg
n(F) - pi^2*b^2*d^2 + 2*b^2*d^2*log(abs(F))^2)^2 + 4*(pi*b^2*d^2*log(abs(F)
)*sgn(F) - pi*b^2*d^2*log(abs(F)))^2))*sin(-1/2*pi*b*d^2*x^2*sgn(F) + 1/2*p
i*b*d^2*x^2 - pi*b*c*d*x*sgn(F) + pi*b*c*d*x - 1/2*pi*b*c^2*sgn(F) + 1/2*pi
*b*c^2 - 1/2*pi*a*sgn(F) + 1/2*pi*a))*e^(b*c^2*log(abs(F)) + (d*x^2 + 2*c*x
)*b*d*log(abs(F)) + a*log(abs(F))) - 1/4*((2*b*c^2*d*i*log(abs(F)) + 2*(d*x
^2 + 2*c*x)*b*d^2*i*log(abs(F)) - pi*b*c^2*d*sgn(F) - pi*(d*x^2 + 2*c*x)*b*
d^2*sgn(F) + pi*b*c^2*d + pi*(d*x^2 + 2*c*x)*b*d^2 - 2*d*i)*e^(1/2*(pi*b*c^
2*(sgn(F) - 1) + pi*(d*x^2 + 2*c*x)*b*d*(sgn(F) - 1) + pi*a*(sgn(F) - 1))*i
)/(2*pi*b^2*d^2*i*log(abs(F))*sgn(F) - 2*pi*b^2*d^2*i*log(abs(F)) + pi^2*b^
2*d^2*sgn(F) - pi^2*b^2*d^2 + 2*b^2*d^2*log(abs(F))^2) + (2*b*c^2*d*i*log(a
bs(F)) + 2*(d*x^2 + 2*c*x)*b*d^2*i*log(abs(F)) + pi*b*c^2*d*sgn(F) + pi*(d*
x^2 + 2*c*x)*b*d^2*sgn(F) - pi*b*c^2*d - pi*(d*x^2 + 2*c*x)*b*d^2 - 2*d*i)*
e^(-1/2*(pi*b*c^2*(sgn(F) - 1) + pi*(d*x^2 + 2*c*x)*b*d*(sgn(F) - 1) + pi*a
*(sgn(F) - 1))*i)/(2*pi*b^2*d^2*i*log(abs(F))*sgn(F) - 2*pi*b^2*d^2*i*log(a
bs(F)) - pi^2*b^2*d^2*sgn(F) + pi^2*b^2*d^2 - 2*b^2*d^2*log(abs(F))^2))*e^(
b*c^2*log(abs(F)) + (d*x^2 + 2*c*x)*b*d*log(abs(F)) + a*log(abs(F)))/i
```

maple [A] time = 0.01, size = 63, normalized size = 1.02

$$\frac{\left(b\,d^2x^2\ln(F)+2bcdx\ln(F)+b\,c^2\ln(F)-1\right)F^{b\,d^2x^2+2bcdx+b\,c^2+a}}{2b^2d\ln(F)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+(d*x+c)^2*b)*(d*x+c)^3,x)
```

```
[Out] 1/2*(b*d^2*x^2*ln(F)+2*b*c*d*x*ln(F)+b*c^2*ln(F)-1)*F^(b*d^2*x^2+2*b*c*d*x+
b*c^2+a)/b^2/d/ln(F)^2
```

maxima [C] time = 4.15, size = 683, normalized size = 11.02

$$-\frac{3\left(\frac{\sqrt{\pi}\left(bd^2x+bcd\right)bc\left(\operatorname{erf}\left(\sqrt{-\frac{\left(bd^2x+bcd\right)^2\log(F)}{bd^2}}\right)-1\right)\log(F)^2}{\left(b\log(F)\right)^{\frac{3}{2}}d^2\sqrt{-\frac{\left(bd^2x+bcd\right)^2\log(F)}{bd^2}}}-\frac{F^{\frac{\left(bd^2x+bcd\right)^2}{bd^2}}b\log(F)}{\left(b\log(F)\right)^{\frac{3}{2}}d}\right)F^ac^2}{2\sqrt{b\log(F)}}+\frac{3\left(\frac{\sqrt{\pi}\left(bd^2x+bcd\right)b^2c^2\left(\operatorname{erf}\left(\sqrt{-\frac{\left(bd^2x+bcd\right)^2\log(F)}{bd^2}}\right)-\right.}{\left(b\log(F)\right)^{\frac{5}{2}}d^3\sqrt{-\frac{\left(bd^2x+bcd\right)^2\log(F)}{bd^2}}}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^3,x, algorithm="maxima")
```

```
[Out] -3/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b*c*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/
(b*d^2))) - 1)*log(F)^2/((b*log(F))^(3/2)*d^2*sqrt(-(b*d^2*x + b*c*d)^2*log
(F)/(b*d^2))) - F^((b*d^2*x + b*c*d)^2/(b*d^2))*b*log(F)/((b*log(F))^(3/2)*
d))*F^a*c^2/sqrt(b*log(F)) + 3/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b^2*c^2*(erf(s
qrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^3/((b*log(F))^(5/2)*d
^3*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 2*F^((b*d^2*x + b*c*d)^2/(b
*d^2))*b^2*c*log(F)^2/((b*log(F))^(5/2)*d^2) - (b*d^2*x + b*c*d)^3*gamma(3/
2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F))^(5/2)*d^5*(-(b
*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)))*F^a*c*d/sqrt(b*log(F)) - 1/2*(sqr
t(pi)*(b*d^2*x + b*c*d)*b^3*c^3*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^
2))) - 1)*log(F)^4/((b*log(F))^(7/2)*d^4*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(
b*d^2))) - 3*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^3*c^2*log(F)^3/((b*log(F))^(
7/2)*d^3) - 3*(b*d^2*x + b*c*d)^3*b*c*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F
)/(b*d^2))*log(F)^4/((b*log(F))^(7/2)*d^6*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d
^2))^(3/2)) + b^2*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^2/((
b*log(F))^(7/2)*d^3))*F^a*d^2/sqrt(b*log(F)) + 1/2*sqrt(pi)*F^(b*c^2 + a)*c
^3*erf(sqrt(-b*log(F))*d*x - b*c*log(F)/sqrt(-b*log(F)))/(sqrt(-b*log(F))*F
^(b*c^2)*d)
```

mupad [B] time = 3.55, size = 67, normalized size = 1.08

$$\frac{F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,\left(b\,\ln(F)\,c^2+2\,b\,\ln(F)\,c\,d\,x+b\,\ln(F)\,d^2\,x^2-1\right)}{2\,b^2\,d\,{\ln(F)}^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)*(c + d*x)^3,x)
```

```
[Out] (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*(b*c^2*log(F) + b*d^2*x^2*log(F)
 + 2*b*c*d*x*log(F) - 1))/(2*b^2*d*log(F)^2)
```

sympy [A] time = 0.19, size = 100, normalized size = 1.61

$$\begin{cases} \frac{F^{a+b(c+dx)^2}\left(bc^2\log{(F)}+2bcdx\log{(F)}+bd^2x^2\log{(F)}-1\right)}{2b^2d\log{(F)}^2} & \text{for } 2b^2d\log{(F)}^2\neq 0 \\ c^3x+\frac{3c^2dx^2}{2}+cd^2x^3+\frac{d^3x^4}{4} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)*(d*x+c)**3,x)
```

```
[Out] Piecewise((F**(a + b*(c + d*x)**2)*(b*c**2*log(F) + 2*b*c*d*x*log(F) + b*d*
*2*x**2*log(F) - 1)/(2*b**2*d*log(F)**2), Ne(2*b**2*d*log(F)**2, 0)), (c**3
*x + 3*c**2*d*x**2/2 + c*d**2*x**3 + d**3*x**4/4, True))
```

3.260 $\int F^{a+b(c+dx)^2}(c+dx)\,dx$

Optimal. Leaf size=27

$$\frac{F^{a+b(c+dx)^2}}{2bd\log(F)}$$

```
[Out] 1/2*F^(a+b*(d*x+c)^2)/b/d/ln(F)
```

Rubi [A] time = 0.04, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.053, Rules used = {2209}

$$\frac{F^{a+b(c+dx)^2}}{2bd\log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)*(c + d*x),x]
```

```
[Out] F^(a + b*(c + d*x)^2)/(2*b*d*Log[F])
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+b(c+dx)^2}(c+dx)\,dx = \frac{F^{a+b(c+dx)^2}}{2bd\log(F)}$$

Mathematica [A] time = 0.01, size = 27, normalized size = 1.00

$$\frac{F^{a+b(c+dx)^2}}{2bd\log(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)*(c + d*x),x]
```

```
[Out] F^(a + b*(c + d*x)^2)/(2*b*d*Log[F])
```

fricas [A]   time = 0.43, size = 35, normalized size = 1.30

$$\frac{F^{bd^2x^2+2\,bcdx+bc^2+a}}{2\,bd\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c),x, algorithm="fricas")
[Out] 1/2*F^(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a)/(b*d*log(F))
```

giac [A]   time = 0.19, size = 35, normalized size = 1.30

$$\frac{F^{bd^2x^2+2\,bcdx+bc^2+a}}{2\,bd\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c),x, algorithm="giac")
[Out] 1/2*F^(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a)/(b*d*log(F))
```

maple [A]   time = 0.01, size = 36, normalized size = 1.33

$$\frac{F^{b\,d^2x^2+2bcdx+b\,c^2+a}}{2bd\ln(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+(d*x+c)^2*b)*(d*x+c),x)
[Out] 1/2*F^(b*d^2*x^2+2*b*c*d*x+b*c^2+a)/b/d/ln(F)
```

maxima [A]   time = 1.19, size = 25, normalized size = 0.93

$$\frac{F^{(dx+c)^2b+a}}{2\,bd\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c),x, algorithm="maxima")
[Out] 1/2*F^((d*x + c)^2*b + a)/(b*d*log(F))
```

mupad [B]   time = 3.52, size = 25, normalized size = 0.93

$$\frac{F^{a+b\,(c+d\,x)^2}}{2\,b\,d\,\ln(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)*(c + d*x),x)
```

```
[Out] F^(a + b*(c + d*x)^2)/(2*b*d*log(F))
```

sympy [A] time = 0.14, size = 36, normalized size = 1.33

$$\begin{cases} \frac{F^{a+b(c+dx)^2}}{2bd\log(F)} & \text{for } 2bd\log(F) \neq 0 \\ cx + \frac{dx^2}{2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)*(d*x+c),x)
```

```
[Out] Piecewise((F**(a + b*(c + d*x)**2)/(2*b*d*log(F)), Ne(2*b*d*log(F), 0)), (c
*x + d*x**2/2, True))
```

3.261 $\int \frac{F^{a+b(c+dx)^2}}{c+dx}\,dx$

Optimal. Leaf size=22

$$\frac{F^a\text{Ei}\left(b(c+dx)^2\log(F)\right)}{2d}$$

```
[Out] 1/2*F^a*Ei(b*(d*x+c)^2*ln(F))/d
```

Rubi [A] time = 0.07, antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2210}

$$\frac{F^a\text{Ei}\left(b(c+dx)^2\log(F)\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)/(c + d*x),x]
[Out] (F^a*ExpIntegralEi[b*(c + d*x)^2*Log[F]])/(2*d)
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^2}}{c+dx}\,dx = \frac{F^a\text{Ei}\left(b(c+dx)^2\log(F)\right)}{2d}$$

Mathematica [A] time = 0.01, size = 22, normalized size = 1.00

$$\frac{F^a\text{Ei}\left(b(c+dx)^2\log(F)\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)/(c + d*x),x]
[Out] (F^a*ExpIntegralEi[b*(c + d*x)^2*Log[F]])/(2*d)
```

fricas [A] time = 0.52, size = 32, normalized size = 1.45

$$\frac{F^a \mathrm{Ei}\left(\left(bd^2x^2 + 2\,bcdx + bc^2\right)\log(F)\right)}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c),x, algorithm="fricas")
[Out] 1/2*F^a*Ei((b*d^2*x^2 + 2*b*c*d*x + b*c^2)*log(F))/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^2 b+a}}{dx+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c),x, algorithm="giac")
[Out] integrate(F^((d*x + c)^2*b + a)/(d*x + c), x)
```

maple [A] time = 0.04, size = 23, normalized size = 1.05

$$-\frac{F^a\,\mathrm{Ei}\left(1, -\left(dx+c\right)^2 b\ln(F)\right)}{2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+(d*x+c)^2*b)/(d*x+c),x)
[Out] -1/2/d*F^a*Ei(1,-b*(d*x+c)^2*ln(F))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^2 b+a}}{dx+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c),x, algorithm="maxima")
[Out] integrate(F^((d*x + c)^2*b + a)/(d*x + c), x)
```

mupad [B] time = 3.68, size = 20, normalized size = 0.91

$$\frac{F^a\,\mathrm{ei}\left(b\,\ln(F)\,\left(c+d\,x\right)^2\right)}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)/(c + d*x),x)
```

```
[Out] (F^a*ei(b*log(F)*(c + d*x)^2))/(2*d)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b(c+dx)^2}}{c+dx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)/(d*x+c),x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**2)/(c + d*x), x)
```

3.262 $\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^3} dx$

Optimal. Leaf size=53

$$\frac{bF^a \log(F)\text{Ei}\left(b(c+dx)^2\log(F)\right)}{2d} - \frac{F^{a+b(c+dx)^2}}{2d(c+dx)^2}$$

```
[Out] -1/2*F^(a+b*(d*x+c)^2)/d/(d*x+c)^2+1/2*b*F^a*Ei(b*(d*x+c)^2*ln(F))*ln(F)/d
```

Rubi [A] time = 0.13, antiderivative size = 53, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2214, 2210}

$$\frac{bF^a \log(F)\text{Ei}\left(b(c+dx)^2\log(F)\right)}{2d} - \frac{F^{a+b(c+dx)^2}}{2d(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)/(c + d*x)^3,x]
```

```
[Out] -F^(a + b*(c + d*x)^2)/(2*d*(c + d*x)^2) + (b*F^a*ExpIntegralEi[b*(c + d*x)
^2*Log[F]]*Log[F])/(2*d)
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^3}\,dx = -\frac{F^{a+b(c+dx)^2}}{2d(c+dx)^2} + (b\log(F))\int \frac{F^{a+b(c+dx)^2}}{c+dx}\,dx$$
$$= -\frac{F^{a+b(c+dx)^2}}{2d(c+dx)^2} + \frac{bF^a\text{Ei}\left(b(c+dx)^2\log(F)\right)\log(F)}{2d}$$

Mathematica [A] time = 0.04, size = 47, normalized size = 0.89

$$\frac{F^a\left(b\log(F)\text{Ei}\left(b(c+dx)^2\log(F)\right) - \frac{F^{b(c+dx)^2}}{(c+dx)^2}\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)/(c + d*x)^3,x]
```

```
[Out] (F^a*(-(F^(b*(c + d*x)^2)/(c + d*x)^2) + b*ExpIntegralEi[b*(c + d*x)^2*Log[
F]]*Log[F]))/(2*d)
```

fricas [B] time = 0.43, size = 100, normalized size = 1.89

$$\frac{\left(bd^2x^2 + 2\,bcdx + bc^2\right)F^a\text{Ei}\left(\left(bd^2x^2 + 2\,bcdx + bc^2\right)\log(F)\right)\log(F) - F^{bd^2x^2+2\,bcdx+bc^2+a}}{2\left(d^3x^2 + 2\,cd^2x + c^2d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^3,x, algorithm="fricas")
```

```
[Out] 1/2*((b*d^2*x^2 + 2*b*c*d*x + b*c^2)*F^a*Ei((b*d^2*x^2 + 2*b*c*d*x + b*c^2)
*log(F))*log(F) - F^(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a))/(d^3*x^2 + 2*c*d^2
*x + c^2*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^2b+a}}{(dx+c)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^3,x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^2*b + a)/(d*x + c)^3, x)
```

maple [A] time = 0.06, size = 53, normalized size = 1.00

$$-\frac{b F^{a} \operatorname{Ei}\left(1,-(dx+c)^{2} b \ln(F)\right) \ln(F)}{2d}-\frac{F^{a} F^{(dx+c)^{2} b}}{2 (dx+c)^{2} d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+(d*x+c)^2*b)/(d*x+c)^3,x)
```

```
[Out] -1/2/d/(d*x+c)^2*F^((d*x+c)^2*b)*F^a-1/2/d*b*ln(F)*F^a*Ei(1,-(d*x+c)^2*b*ln
(F))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^{2} b+a}}{(dx+c)^{3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^3,x, algorithm="maxima")
```

```
[Out] integrate(F^((d*x + c)^2*b + a)/(d*x + c)^3, x)
```

mupad [B] time = 4.68, size = 51, normalized size = 0.96

$$-\frac{F^{a} \left(F^{b (c+d x)^{2}}+b \ln(F) \operatorname{expint}\left(-b \ln(F) (c+d x)^{2}\right) (c+d x)^{2}\right)}{2 d (c+d x)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)/(c + d*x)^3,x)
```

```
[Out] -(F^a*(F^(b*(c + d*x)^2) + b*log(F)*expint(-b*log(F)*(c + d*x)^2)*(c + d*x)
^2))/(2*d*(c + d*x)^2)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b(c+dx)^{2}}}{(c+dx)^{3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)/(d*x+c)**3,x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**2)/(c + d*x)**3, x)
```

3.263 $\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^5} dx$

Optimal. Leaf size=87

$$\frac{b^2F^a\log^2(F)\text{Ei}\left(b(c+dx)^2\log(F)\right)}{4d}-\frac{F^{a+b(c+dx)^2}}{4d(c+dx)^4}-\frac{b\log(F)F^{a+b(c+dx)^2}}{4d(c+dx)^2}$$

```
[Out] -1/4*F^(a+b*(d*x+c)^2)/d/(d*x+c)^4-1/4*b*F^(a+b*(d*x+c)^2)*ln(F)/d/(d*x+c)^
2+1/4*b^2*F^a*Ei(b*(d*x+c)^2*ln(F))*ln(F)^2/d
```

Rubi [A] time = 0.20, antiderivative size = 87, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2214, 2210}

$$\frac{b^2F^a\log^2(F)\text{Ei}\left(b(c+dx)^2\log(F)\right)}{4d}-\frac{F^{a+b(c+dx)^2}}{4d(c+dx)^4}-\frac{b\log(F)F^{a+b(c+dx)^2}}{4d(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)/(c + d*x)^5,x]
```

```
[Out] -F^(a + b*(c + d*x)^2)/(4*d*(c + d*x)^4) - (b*F^(a + b*(c + d*x)^2)*Log[F])
/(4*d*(c + d*x)^2) + (b^2*F^a*ExpIntegralEi[b*(c + d*x)^2*Log[F]]*Log[F]^2)
/(4*d)
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^5}\,dx = -\frac{F^{a+b(c+dx)^2}}{4d(c+dx)^4} + \frac{1}{2}(b\log(F))\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^3}\,dx$$
$$= -\frac{F^{a+b(c+dx)^2}}{4d(c+dx)^4} - \frac{bF^{a+b(c+dx)^2}\log(F)}{4d(c+dx)^2} + \frac{1}{2}\left(b^2\log^2(F)\right)\int \frac{F^{a+b(c+dx)^2}}{c+dx}\,dx$$
$$= -\frac{F^{a+b(c+dx)^2}}{4d(c+dx)^4} - \frac{bF^{a+b(c+dx)^2}\log(F)}{4d(c+dx)^2} + \frac{b^2F^a\text{Ei}\left(b(c+dx)^2\log(F)\right)\log^2(F)}{4d}$$

Mathematica [A] time = 0.07, size = 64, normalized size = 0.74

$$\frac{F^a\left(b^2\log^2(F)\text{Ei}\left(b(c+dx)^2\log(F)\right) - \frac{F^{b(c+dx)^2}\left(b\log(F)(c+dx)^2+1\right)}{(c+dx)^4}\right)}{4d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)/(c + d*x)^5,x]
```

```
[Out] (F^a*(b^2*ExpIntegralEi[b*(c + d*x)^2*Log[F]]*Log[F]^2 - (F^(b*(c + d*x)^2)
*(1 + b*(c + d*x)^2*Log[F]))/(c + d*x)^4))/(4*d)
```

fricas [B] time = 0.42, size = 183, normalized size = 2.10

$$\frac{\left(b^2d^4x^4 + 4\,b^2cd^3x^3 + 6\,b^2c^2d^2x^2 + 4\,b^2c^3dx + b^2c^4\right)F^a\text{Ei}\left(\left(bd^2x^2 + 2\,bcdx + bc^2\right)\log(F)\right)\log(F)^2 - \left(\left(bd^2x^2 + 2\right.\right.}{4\left(d^5x^4 + 4\,cd^4x^3 + 6\,c^2d^3x^2 + 4\,c^3d^2x + c^4d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^5,x, algorithm="fricas")
```

```
[Out] 1/4*((b^2*d^4*x^4 + 4*b^2*c*d^3*x^3 + 6*b^2*c^2*d^2*x^2 + 4*b^2*c^3*d*x + b
^2*c^4)*F^a*Ei((b*d^2*x^2 + 2*b*c*d*x + b*c^2)*log(F))*log(F)^2 - ((b*d^2*x
^2 + 2*b*c*d*x + b*c^2)*log(F) + 1)*F^(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a))/
(d^5*x^4 + 4*c*d^4*x^3 + 6*c^2*d^3*x^2 + 4*c^3*d^2*x + c^4*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^2b+a}}{(dx+c)^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^5,x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^2*b + a)/(d*x + c)^5, x)
```

maple [A] time = 0.07, size = 86, normalized size = 0.99

$$-\frac{b^{2} F^{a} \operatorname{Ei}\left(1,-\left(d x+c\right)^{2} b \ln\left(F\right)\right) \ln\left(F\right)^{2}}{4 d}-\frac{b\, F^{a} F^{\left(d x+c\right)^{2} b} \ln\left(F\right)}{4 \left(d x+c\right)^{2} d}-\frac{F^{a} F^{\left(d x+c\right)^{2} b}}{4 \left(d x+c\right)^{4} d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+(d*x+c)^2*b)/(d*x+c)^5,x)
```

```
[Out] -1/4/d/(d*x+c)^4*F^((d*x+c)^2*b)*F^a-1/4/d*b*ln(F)/(d*x+c)^2*F^((d*x+c)^2*b
)*F^a-1/4/d*b^2*ln(F)^2*F^a*Ei(1,-(d*x+c)^2*b*ln(F))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{\left(d x+c\right)^{2} b+a}}{\left(d x+c\right)^{5}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^5,x, algorithm="maxima")
```

```
[Out] integrate(F^((d*x + c)^2*b + a)/(d*x + c)^5, x)
```

mupad [B] time = 5.76, size = 76, normalized size = 0.87

$$-\frac{F^{a}\, b^{2} \ln\left(F\right)^{2} \left(\frac{\mathrm{expint}\left(-b\, \ln\left(F\right) \left(c+d\, x\right)^{2}\right)}{2}+F^{b \left(c+d\, x\right)^{2}} \left(\frac{1}{2\, b\, \ln\left(F\right) \left(c+d\, x\right)^{2}}+\frac{1}{2\, b^{2} \ln\left(F\right)^{2} \left(c+d\, x\right)^{4}}\right)\right)}{2\, d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)/(c + d*x)^5,x)
```

```
[Out] -(F^a*b^2*log(F)^2*(expint(-b*log(F)*(c + d*x)^2)/2 + F^(b*(c + d*x)^2)*(1/
(2*b*log(F)*(c + d*x)^2) + 1/(2*b^2*log(F)^2*(c + d*x)^4))))/(2*d)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)/(d*x+c)**5,x)
```

```
[Out] Timed out
```

3.264 $\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^7} dx$

Optimal. Leaf size=121

$$\frac{b^3F^a\log^3(F)\text{Ei}\left(b(c+dx)^2\log(F)\right)}{12d}-\frac{b^2\log^2(F)F^{a+b(c+dx)^2}}{12d(c+dx)^2}-\frac{F^{a+b(c+dx)^2}}{6d(c+dx)^6}-\frac{b\log(F)F^{a+b(c+dx)^2}}{12d(c+dx)^4}$$

```
[Out] -1/6*F^(a+b*(d*x+c)^2)/d/(d*x+c)^6-1/12*b*F^(a+b*(d*x+c)^2)*ln(F)/d/(d*x+c)
^4-1/12*b^2*F^(a+b*(d*x+c)^2)*ln(F)^2/d/(d*x+c)^2+1/12*b^3*F^a*Ei(b*(d*x+c)
^2*ln(F))*ln(F)^3/d
```

Rubi [A] time = 0.26, antiderivative size = 121, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2214, 2210}

$$\frac{b^3F^a\log^3(F)\text{Ei}\left(b(c+dx)^2\log(F)\right)}{12d}-\frac{b^2\log^2(F)F^{a+b(c+dx)^2}}{12d(c+dx)^2}-\frac{F^{a+b(c+dx)^2}}{6d(c+dx)^6}-\frac{b\log(F)F^{a+b(c+dx)^2}}{12d(c+dx)^4}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)/(c + d*x)^7,x]
```

```
[Out] -F^(a + b*(c + d*x)^2)/(6*d*(c + d*x)^6) - (b*F^(a + b*(c + d*x)^2)*Log[F])
/(12*d*(c + d*x)^4) - (b^2*F^(a + b*(c + d*x)^2)*Log[F]^2)/(12*d*(c + d*x)^
2) + (b^3*F^a*ExpIntegralEi[b*(c + d*x)^2*Log[F]]*Log[F]^3)/(12*d)
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^7}\,dx = -\frac{F^{a+b(c+dx)^2}}{6d(c+dx)^6} + \frac{1}{3}(b\log(F))\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^5}\,dx$$
$$= -\frac{F^{a+b(c+dx)^2}}{6d(c+dx)^6} - \frac{bF^{a+b(c+dx)^2}\log(F)}{12d(c+dx)^4} + \frac{1}{6}\left(b^2\log^2(F)\right)\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^3}\,dx$$
$$= -\frac{F^{a+b(c+dx)^2}}{6d(c+dx)^6} - \frac{bF^{a+b(c+dx)^2}\log(F)}{12d(c+dx)^4} - \frac{b^2F^{a+b(c+dx)^2}\log^2(F)}{12d(c+dx)^2} + \frac{1}{6}\left(b^3\log^3(F)\right)\int \frac{F^{a+b(c+dx)^2}}{c+dx}\,dx$$
$$= -\frac{F^{a+b(c+dx)^2}}{6d(c+dx)^6} - \frac{bF^{a+b(c+dx)^2}\log(F)}{12d(c+dx)^4} - \frac{b^2F^{a+b(c+dx)^2}\log^2(F)}{12d(c+dx)^2} + \frac{b^3F^a\text{Ei}\left(b(c+dx)^2\log(F)\right)\log^3(}{12d}$$

Mathematica [A] time = 0.09, size = 79, normalized size = 0.65

$$\frac{F^a\left(b^3\log^3(F)\text{Ei}\left(b(c+dx)^2\log(F)\right) - \frac{F^{b(c+dx)^2}\left(b^2\log^2(F)(c+dx)^4+b\log(F)(c+dx)^2+2\right)}{(c+dx)^6}\right)}{12d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)/(c + d*x)^7,x]
```

```
[Out] (F^a*(b^3*ExpIntegralEi[b*(c + d*x)^2*Log[F]]*Log[F]^3 - (F^(b*(c + d*x)^2)
*(2 + b*(c + d*x)^2*Log[F] + b^2*(c + d*x)^4*Log[F]^2))/(c + d*x)^6))/(12*d
)
```

fricas [B] time = 0.43, size = 292, normalized size = 2.41

$$\frac{\left(b^3d^6x^6 + 6\,b^3cd^5x^5 + 15\,b^3c^2d^4x^4 + 20\,b^3c^3d^3x^3 + 15\,b^3c^4d^2x^2 + 6\,b^3c^5dx + b^3c^6\right)F^a\text{Ei}\left(\left(bd^2x^2 + 2\,bcdx + bc^2\right)\text{lo}\right.}{12\left(d^7x^6 + 6\,cd^6x^5 + 15\,c^2\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^7,x, algorithm="fricas")
```

```
[Out] 1/12*((b^3*d^6*x^6 + 6*b^3*c*d^5*x^5 + 15*b^3*c^2*d^4*x^4 + 20*b^3*c^3*d^3*
x^3 + 15*b^3*c^4*d^2*x^2 + 6*b^3*c^5*d*x + b^3*c^6)*F^a*Ei((b*d^2*x^2 + 2*b
*c*d*x + b*c^2)*log(F))*log(F)^3 - ((b^2*d^4*x^4 + 4*b^2*c*d^3*x^3 + 6*b^2*
c^2*d^2*x^2 + 4*b^2*c^3*d*x + b^2*c^4)*log(F)^2 + (b*d^2*x^2 + 2*b*c*d*x +
b*c^2)*log(F) + 2)*F^(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a))/(d^7*x^6 + 6*c*d^
6*x^5 + 15*c^2*d^5*x^4 + 20*c^3*d^4*x^3 + 15*c^4*d^3*x^2 + 6*c^5*d^2*x + c^
6*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^2b+a}}{(dx+c)^7}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^7,x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^2*b + a)/(d*x + c)^7, x)
```

maple [A] time = 0.09, size = 119, normalized size = 0.98

$$-\frac{b^3F^a \operatorname{Ei}\left(1,-(dx+c)^2 b\ln(F)\right)\ln(F)^3}{12d}-\frac{b^2F^aF^{(dx+c)^2b}\ln(F)^2}{12\,(dx+c)^2\,d}-\frac{b\,F^aF^{(dx+c)^2b}\ln(F)}{12\,(dx+c)^4\,d}-\frac{F^aF^{(dx+c)^2b}}{6\,(dx+c)^6\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+(d*x+c)^2*b)/(d*x+c)^7,x)
```

```
[Out] -1/6/d/(d*x+c)^6*F^((d*x+c)^2*b)*F^a-1/12/d*b*ln(F)/(d*x+c)^4*F^((d*x+c)^2*
b)*F^a-1/12/d*b^2*ln(F)^2/(d*x+c)^2*F^((d*x+c)^2*b)*F^a-1/12/d*b^3*ln(F)^3*
F^a*Ei(1,-(d*x+c)^2*b*ln(F))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^2b+a}}{(dx+c)^7}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^7,x, algorithm="maxima")
```

```
[Out] integrate(F^((d*x + c)^2*b + a)/(d*x + c)^7, x)
```

mupad [B] time = 3.82, size = 104, normalized size = 0.86

$$-\frac{F^a\,b^3\ln(F)^3\operatorname{expint}\left(-b\,\ln(F)\,(c+d\,x)^2\right)}{12\,d}-\frac{F^a\,F^{b\,(c+d\,x)^2}\,b^3\ln(F)^3\,\left(\frac{1}{6\,b\,\ln(F)\,(c+d\,x)^2}+\frac{1}{6\,b^2\ln(F)^2\,(c+d\,x)^4}+\frac{1}{3\,b^3\ln(F)^3\,(c+\cdots}\right.}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)/(c + d*x)^7,x)
```

```
[Out] - (F^a*b^3*log(F)^3*expint(-b*log(F)*(c + d*x)^2))/(12*d) - (F^a*F^(b*(c +
d*x)^2)*b^3*log(F)^3*(1/(6*b*log(F)*(c + d*x)^2) + 1/(6*b^2*log(F)^2*(c + d
*x)^4) + 1/(3*b^3*log(F)^3*(c + d*x)^6)))/(2*d)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)/(d*x+c)**7,x)
```

```
[Out] Timed out
```

3.265 $\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^9}\,dx$

Optimal. Leaf size=31

$$-\frac{b^4 F^a \log^4(F)\Gamma\left(-4,-b(c+dx)^2\log(F)\right)}{2d}$$

```
[Out] -1/2*F^a/(d*x+c)^8*Ei(5,-b*(d*x+c)^2*ln(F))/d
```

Rubi [A] time = 0.06, antiderivative size = 31, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2218}

$$-\frac{b^4 F^a \log^4(F)\text{Gamma}\left(-4,-b\log(F)(c+dx)^2\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)/(c + d*x)^9,x]
```

```
[Out] -(b^4*F^a*Gamma[-4, -(b*(c + d*x)^2*Log[F])]*Log[F]^4)/(2*d)
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^9}\,dx = -\frac{b^4 F^a \Gamma\left(-4,-b(c+dx)^2\log(F)\right)\log^4(F)}{2d}$$

Mathematica [A] time = 0.01, size = 31, normalized size = 1.00

$$-\frac{b^4 F^a \log^4(F)\Gamma\left(-4,-b(c+dx)^2\log(F)\right)}{2d}$$

Antiderivative was successfully verified.

[In] Integrate[F^(a + b*(c + d*x)^2)/(c + d*x)^9,x]

[Out] -1/2*(b^4*F^a*Gamma[-4, -(b*(c + d*x)^2*Log[F])]*Log[F]^4)/d

fricas [B] time = 0.42, size = 430, normalized size = 13.87

$$\frac{\left(b^4d^8x^8+8\,b^4cd^7x^7+28\,b^4c^2d^6x^6+56\,b^4c^3d^5x^5+70\,b^4c^4d^4x^4+56\,b^4c^5d^3x^3+28\,b^4c^6d^2x^2+8\,b^4c^7dx+b^4c^8\right)F^{\cdots}}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^9,x, algorithm="fricas")

[Out] 1/48*((b^4*d^8*x^8 + 8*b^4*c*d^7*x^7 + 28*b^4*c^2*d^6*x^6 + 56*b^4*c^3*d^5*
x^5 + 70*b^4*c^4*d^4*x^4 + 56*b^4*c^5*d^3*x^3 + 28*b^4*c^6*d^2*x^2 + 8*b^4*
c^7*d*x + b^4*c^8)*F^a*Ei((b*d^2*x^2 + 2*b*c*d*x + b*c^2)*log(F))*log(F)^4
- ((b^3*d^6*x^6 + 6*b^3*c*d^5*x^5 + 15*b^3*c^2*d^4*x^4 + 20*b^3*c^3*d^3*x^3
 + 15*b^3*c^4*d^2*x^2 + 6*b^3*c^5*d*x + b^3*c^6)*log(F)^3 + (b^2*d^4*x^4 +
4*b^2*c*d^3*x^3 + 6*b^2*c^2*d^2*x^2 + 4*b^2*c^3*d*x + b^2*c^4)*log(F)^2 + 2
*(b*d^2*x^2 + 2*b*c*d*x + b*c^2)*log(F) + 6)*F^(b*d^2*x^2 + 2*b*c*d*x + b*c
^2 + a))/(d^9*x^8 + 8*c*d^8*x^7 + 28*c^2*d^7*x^6 + 56*c^3*d^6*x^5 + 70*c^4*
d^5*x^4 + 56*c^5*d^4*x^3 + 28*c^6*d^3*x^2 + 8*c^7*d^2*x + c^8*d)

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^2b+a}}{(dx+c)^9}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^9,x, algorithm="giac")

[Out] integrate(F^((d*x + c)^2*b + a)/(d*x + c)^9, x)

maple [B] time = 0.12, size = 152, normalized size = 4.90

$$-\frac{b^4F^a\operatorname{Ei}\left(1,-(dx+c)^2b\ln(F)\right)\ln(F)^4}{48d}-\frac{b^3F^aF^{(dx+c)^2b}\ln(F)^3}{48\,(dx+c)^2\,d}-\frac{b^2F^aF^{(dx+c)^2b}\ln(F)^2}{48\,(dx+c)^4\,d}-\frac{b\,F^aF^{(dx+c)^2b}\ln(F)}{24\,(dx+c)^6\,d}-\frac{F^aF^{(dx+c)^{\cdots}}}{8\,(dx+c)^{\cdots}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(F^(a+(d*x+c)^2*b)/(d*x+c)^9,x)

[Out] -1/8/d/(d*x+c)^8*F^((d*x+c)^2*b)*F^a-1/24/d*b*ln(F)/(d*x+c)^6*F^((d*x+c)^2*
b)*F^a-1/48/d*b^2*ln(F)^2/(d*x+c)^4*F^((d*x+c)^2*b)*F^a-1/48/d*b^3*ln(F)^3/

```
(d*x+c)^2*F^((d*x+c)^2*b)*F^a-1/48/d*b^4*ln(F)^4*F^a*Ei(1,-(d*x+c)^2*b*ln(F
))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^2b+a}}{(dx+c)^9}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^9,x, algorithm="maxima")
```

```
[Out] integrate(F^((d*x + c)^2*b + a)/(d*x + c)^9, x)
```

mupad [B] time = 3.81, size = 120, normalized size = 3.87

$$-\frac{F^a\,b^4\,\ln(F)^4\,\mathrm{expint}\left(-b\,\ln(F)\,(c+d\,x)^2\right)}{48\,d}-\frac{F^a\,F^{b\,(c+d\,x)^2}\,b^4\,\ln(F)^4\,\left(\frac{1}{24\,b\,\ln(F)\,(c+d\,x)^2}+\frac{1}{24\,b^2\,\ln(F)^2\,(c+d\,x)^4}+\frac{1}{12\,b^3\,\ln(F)^3}\right.}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)/(c + d*x)^9,x)
```

```
[Out] - (F^a*b^4*log(F)^4*expint(-b*log(F)*(c + d*x)^2))/(48*d) - (F^a*F^(b*(c +
d*x)^2)*b^4*log(F)^4*(1/(24*b*log(F)*(c + d*x)^2) + 1/(24*b^2*log(F)^2*(c +
 d*x)^4) + 1/(12*b^3*log(F)^3*(c + d*x)^6) + 1/(4*b^4*log(F)^4*(c + d*x)^8)
))/(2*d)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)/(d*x+c)**9,x)
```

```
[Out] Timed out
```

3.266 $\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^{11}} dx$

Optimal. Leaf size=31

$$\frac{b^5 F^a \log^5(F)\Gamma\left(-5,-b(c+dx)^2\log(F)\right)}{2d}$$

```
[Out] -1/2*F^a/(d*x+c)^10*Ei(6,-b*(d*x+c)^2*ln(F))/d
```

Rubi [A] time = 0.06, antiderivative size = 31, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2218}

$$\frac{b^5 F^a \log^5(F)\text{Gamma}\left(-5,-b\log(F)(c+dx)^2\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)/(c + d*x)^11,x]
```

```
[Out] (b^5*F^a*Gamma[-5, -(b*(c + d*x)^2*Log[F])]*Log[F]^5)/(2*d)
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^{11}} dx = \frac{b^5 F^a \Gamma\left(-5,-b(c+dx)^2\log(F)\right)\log^5(F)}{2d}$$

Mathematica [A] time = 0.01, size = 31, normalized size = 1.00

$$\frac{b^5 F^a \log^5(F)\Gamma\left(-5,-b(c+dx)^2\log(F)\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)/(c + d*x)^11,x]
```

```
[Out] (b^5*F^a*Gamma[-5, -(b*(c + d*x)^2*Log[F])]*Log[F]^5)/(2*d)
```

fricas [B] time = 0.46, size = 596, normalized size = 19.23

$$\frac{\left(b^5 d^{10} x^{10} + 10\, b^5 c d^9 x^9 + 45\, b^5 c^2 d^8 x^8 + 120\, b^5 c^3 d^7 x^7 + 210\, b^5 c^4 d^6 x^6 + 252\, b^5 c^5 d^5 x^5 + 210\, b^5 c^6 d^4 x^4 + 120\, b^5 c^7 d\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^11,x, algorithm="fricas")
```

```
[Out] 1/240*((b^5*d^10*x^10 + 10*b^5*c*d^9*x^9 + 45*b^5*c^2*d^8*x^8 + 120*b^5*c^3
*d^7*x^7 + 210*b^5*c^4*d^6*x^6 + 252*b^5*c^5*d^5*x^5 + 210*b^5*c^6*d^4*x^4
+ 120*b^5*c^7*d^3*x^3 + 45*b^5*c^8*d^2*x^2 + 10*b^5*c^9*d*x + b^5*c^10)*F^a
*Ei((b*d^2*x^2 + 2*b*c*d*x + b*c^2)*log(F))*log(F)^5 - ((b^4*d^8*x^8 + 8*b^
4*c*d^7*x^7 + 28*b^4*c^2*d^6*x^6 + 56*b^4*c^3*d^5*x^5 + 70*b^4*c^4*d^4*x^4
+ 56*b^4*c^5*d^3*x^3 + 28*b^4*c^6*d^2*x^2 + 8*b^4*c^7*d*x + b^4*c^8)*log(F)
^4 + (b^3*d^6*x^6 + 6*b^3*c*d^5*x^5 + 15*b^3*c^2*d^4*x^4 + 20*b^3*c^3*d^3*x
^3 + 15*b^3*c^4*d^2*x^2 + 6*b^3*c^5*d*x + b^3*c^6)*log(F)^3 + 2*(b^2*d^4*x^
4 + 4*b^2*c*d^3*x^3 + 6*b^2*c^2*d^2*x^2 + 4*b^2*c^3*d*x + b^2*c^4)*log(F)^2
 + 6*(b*d^2*x^2 + 2*b*c*d*x + b*c^2)*log(F) + 24)*F^(b*d^2*x^2 + 2*b*c*d*x
+ b*c^2 + a))/(d^11*x^10 + 10*c*d^10*x^9 + 45*c^2*d^9*x^8 + 120*c^3*d^8*x^7
 + 210*c^4*d^7*x^6 + 252*c^5*d^6*x^5 + 210*c^6*d^5*x^4 + 120*c^7*d^4*x^3 +
45*c^8*d^3*x^2 + 10*c^9*d^2*x + c^10*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^2 b+a}}{(dx+c)^{11}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^11,x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^2*b + a)/(d*x + c)^11, x)
```

maple [B] time = 0.17, size = 185, normalized size = 5.97

$$-\frac{b^5 F^a \operatorname{Ei}\left(1, -(dx+c)^2 b \ln(F)\right) \ln(F)^5}{240d} - \frac{b^4 F^a F^{(dx+c)^2 b} \ln(F)^4}{240\,(dx+c)^2\, d} - \frac{b^3 F^a F^{(dx+c)^2 b} \ln(F)^3}{240\,(dx+c)^4\, d} - \frac{b^2 F^a F^{(dx+c)^2 b} \ln(F)^2}{120\,(dx+c)^6\, d} - \frac{b\, F^a F^{(d}}{40\,(d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+(d*x+c)^2*b)/(d*x+c)^11,x)
```

[Out] -1/10/d/(d*x+c)^10*F^((d*x+c)^2*b)*F^a-1/40/d*b*ln(F)/(d*x+c)^8*F^((d*x+c)^2*b)*F^a-1/120/d*b^2*ln(F)^2/(d*x+c)^6*F^((d*x+c)^2*b)*F^a-1/240/d*b^3*ln(F)^3/(d*x+c)^4*F^((d*x+c)^2*b)*F^a-1/240/d*b^4*ln(F)^4/(d*x+c)^2*F^((d*x+c)^2*b)*F^a-1/240/d*b^5*ln(F)^5*F^a*Ei(1,-(d*x+c)^2*b*ln(F))

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^2b+a}}{(dx+c)^{11}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^11,x, algorithm="maxima")

[Out] integrate(F^((d*x + c)^2*b + a)/(d*x + c)^11, x)

mupad [B] time = 3.91, size = 136, normalized size = 4.39

$$-\frac{F^a\,b^5\,\ln(F)^5\,\mathrm{expint}\left(-b\,\ln(F)\,(c+d\,x)^2\right)}{240\,d}-\frac{F^a\,F^{b\,(c+d\,x)^2}\,b^5\,\ln(F)^5\,\left(\frac{1}{120\,b\,\ln(F)\,(c+d\,x)^2}+\frac{1}{120\,b^2\,\ln(F)^2\,(c+d\,x)^4}+\frac{1}{60\,b^3\,\ln(F)^3}\right.}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(F^(a + b*(c + d*x)^2)/(c + d*x)^11,x)

[Out] - (F^a*b^5*log(F)^5*expint(-b*log(F)*(c + d*x)^2))/(240*d) - (F^a*F^(b*(c + d*x)^2)*b^5*log(F)^5*(1/(120*b*log(F)*(c + d*x)^2) + 1/(120*b^2*log(F)^2*(c + d*x)^4) + 1/(60*b^3*log(F)^3*(c + d*x)^6) + 1/(20*b^4*log(F)^4*(c + d*x)^8) + 1/(5*b^5*log(F)^5*(c + d*x)^10)))/(2*d)

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F**(a+b*(d*x+c)**2)/(d*x+c)**11,x)

[Out] Timed out

3.267 $\int F^{a+b(c+dx)^2}(c+dx)^{12}\,dx$

Optimal. Leaf size=49

$$-\frac{F^a(c+dx)^{13}\Gamma\left(\frac{13}{2},-b(c+dx)^2\log(F)\right)}{2d\left(-b\log(F)(c+dx)^2\right)^{13/2}}$$

```
[Out] -1/2*F^a*(d*x+c)^13*(524288/5621533568633696205238621875*GAMMA(51/2,-b*(d*x
+c)^2*ln(F))-524288/5621533568633696205238621875*(-b*(d*x+c)^2*ln(F))^(49/2
)*exp(b*(d*x+c)^2*ln(F))-262144/114725174870075432759971875*(-b*(d*x+c)^2*l
n(F))^(47/2)*exp(b*(d*x+c)^2*ln(F))-131072/2440961167448413462978125*(-b*(d
*x+c)^2*ln(F))^(45/2)*exp(b*(d*x+c)^2*ln(F))-65536/54243581498853632510625*
(-b*(d*x+c)^2*ln(F))^(43/2)*exp(b*(d*x+c)^2*ln(F))-32768/12614786395082240l
1875*(-b*(d*x+c)^2*ln(F))^(41/2)*exp(b*(d*x+c)^2*ln(F))-16384/3076777169532
2536875*(-b*(d*x+c)^2*ln(F))^(39/2)*exp(b*(d*x+c)^2*ln(F))-8192/78891722295
6988125*(-b*(d*x+c)^2*ln(F))^(37/2)*exp(b*(d*x+c)^2*ln(F))-4096/21322087106
945625*(-b*(d*x+c)^2*ln(F))^(35/2)*exp(b*(d*x+c)^2*ln(F))-2048/609202488769
875*(-b*(d*x+c)^2*ln(F))^(33/2)*exp(b*(d*x+c)^2*ln(F))-1024/18460681477875*
(-b*(d*x+c)^2*ln(F))^(31/2)*exp(b*(d*x+c)^2*ln(F))-512/595505854125*(-b*(d*
x+c)^2*ln(F))^(29/2)*exp(b*(d*x+c)^2*ln(F))-256/20534684625*(-b*(d*x+c)^2*l
n(F))^(27/2)*exp(b*(d*x+c)^2*ln(F))-128/760543875*(-b*(d*x+c)^2*ln(F))^(25/
2)*exp(b*(d*x+c)^2*ln(F))-64/30421755*(-b*(d*x+c)^2*ln(F))^(23/2)*exp(b*(d*
x+c)^2*ln(F))-32/1322685*(-b*(d*x+c)^2*ln(F))^(21/2)*exp(b*(d*x+c)^2*ln(F))
-16/62985*(-b*(d*x+c)^2*ln(F))^(19/2)*exp(b*(d*x+c)^2*ln(F))-8/3315*(-b*(d*
x+c)^2*ln(F))^(17/2)*exp(b*(d*x+c)^2*ln(F))-4/195*(-b*(d*x+c)^2*ln(F))^(15/
2)*exp(b*(d*x+c)^2*ln(F))-2/13*(-b*(d*x+c)^2*ln(F))^(13/2)*exp(b*(d*x+c)^2*
ln(F)))/d/(-b*(d*x+c)^2*ln(F))^(13/2)
```

Rubi [A] time = 0.07, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2218}

$$-\frac{F^a(c+dx)^{13}\text{Gamma}\left(\frac{13}{2},-b\log(F)(c+dx)^2\right)}{2d\left(-b\log(F)(c+dx)^2\right)^{13/2}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)*(c + d*x)^12,x]
```

```
[Out] -(F^a*(c + d*x)^13*Gamma[13/2, -(b*(c + d*x)^2*Log[F])])/(2*d*(-(b*(c + d*x
)^2*Log[F]))^(13/2))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+b(c+dx)^2}(c+dx)^{12}\,dx=-\frac{F^a(c+dx)^{13}\Gamma\left(\frac{13}{2},-b(c+dx)^2\log(F)\right)}{2d\left(-b(c+dx)^2\log(F)\right)^{13/2}}$$

Mathematica [A] time = 0.03, size = 49, normalized size = 1.00

$$-\frac{F^a(c+dx)^{13}\Gamma\left(\frac{13}{2},-b(c+dx)^2\log(F)\right)}{2d\left(-b\log(F)(c+dx)^2\right)^{13/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)*(c + d*x)^12,x]
```

```
[Out] -1/2*(F^a*(c + d*x)^13*Gamma[13/2, -(b*(c + d*x)^2*Log[F])])/(d*(-(b*(c + d
*x)^2*Log[F]))^(13/2))
```

fricas [A] time = 0.44, size = 617, normalized size = 12.59

$$-\frac{10395\sqrt{\pi}\sqrt{-bd^2\log(F)}\,F^a\operatorname{erf}\left(\frac{\sqrt{-bd^2\log(F)}\,(dx+c)}{d}\right)-2\left(32\left(b^6d^{12}x^{11}+11\,b^6cd^{11}x^{10}+55\,b^6c^2d^{10}x^9+165\,b^6c^3d^9x\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^12,x, algorithm="fricas")
```

```
[Out] -1/128*(10395*sqrt(pi)*sqrt(-b*d^2*log(F))*F^a*erf(sqrt(-b*d^2*log(F))*(d*x
 + c)/d) - 2*(32*(b^6*d^12*x^11 + 11*b^6*c*d^11*x^10 + 55*b^6*c^2*d^10*x^9
+ 165*b^6*c^3*d^9*x^8 + 330*b^6*c^4*d^8*x^7 + 462*b^6*c^5*d^7*x^6 + 462*b^6
*c^6*d^6*x^5 + 330*b^6*c^7*d^5*x^4 + 165*b^6*c^8*d^4*x^3 + 55*b^6*c^9*d^3*x
^2 + 11*b^6*c^10*d^2*x + b^6*c^11*d)*log(F)^6 - 176*(b^5*d^10*x^9 + 9*b^5*c
*d^9*x^8 + 36*b^5*c^2*d^8*x^7 + 84*b^5*c^3*d^7*x^6 + 126*b^5*c^4*d^6*x^5 +
126*b^5*c^5*d^5*x^4 + 84*b^5*c^6*d^4*x^3 + 36*b^5*c^7*d^3*x^2 + 9*b^5*c^8*d
^2*x + b^5*c^9*d)*log(F)^5 + 792*(b^4*d^8*x^7 + 7*b^4*c*d^7*x^6 + 21*b^4*c^
```

```
2*d^6*x^5 + 35*b^4*c^3*d^5*x^4 + 35*b^4*c^4*d^4*x^3 + 21*b^4*c^5*d^3*x^2 +
7*b^4*c^6*d^2*x + b^4*c^7*d)*log(F)^4 - 2772*(b^3*d^6*x^5 + 5*b^3*c*d^5*x^4
 + 10*b^3*c^2*d^4*x^3 + 10*b^3*c^3*d^3*x^2 + 5*b^3*c^4*d^2*x + b^3*c^5*d)*l
og(F)^3 + 6930*(b^2*d^4*x^3 + 3*b^2*c*d^3*x^2 + 3*b^2*c^2*d^2*x + b^2*c^3*d
)*log(F)^2 - 10395*(b*d^2*x + b*c*d)*log(F))*F^(b*d^2*x^2 + 2*b*c*d*x + b*c
^2 + a))/(b^7*d^2*log(F)^7)
```

giac [A] time = 0.37, size = 195, normalized size = 3.98

$$\frac{\left(32\,b^5d^{10}\left(x+\frac{c}{d}\right)^{11}\log(F)^5-176\,b^4d^8\left(x+\frac{c}{d}\right)^9\log(F)^4+792\,b^3d^6\left(x+\frac{c}{d}\right)^7\log(F)^3-2772\,b^2d^4\left(x+\frac{c}{d}\right)^5\log(F)^2}{64\,b^6\log(F)^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^12,x, algorithm="giac")
```

```
[Out] 1/64*(32*b^5*d^10*(x + c/d)^11*log(F)^5 - 176*b^4*d^8*(x + c/d)^9*log(F)^4
+ 792*b^3*d^6*(x + c/d)^7*log(F)^3 - 2772*b^2*d^4*(x + c/d)^5*log(F)^2 + 69
30*b*d^2*(x + c/d)^3*log(F) - 10395*x - 10395*c/d)*e^(b*d^2*x^2*log(F) + 2*
b*c*d*x*log(F) + b*c^2*log(F) + a*log(F))/(b^6*log(F)^6) - 10395/128*sqrt(p
i)*F^a*erf(-sqrt(-b*log(F))*d*(x + c/d))/(sqrt(-b*log(F))*b^6*d*log(F)^6)
```

maple [B] time = 0.51, size = 1896, normalized size = 38.69

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+(d*x+c)^2*b)*(d*x+c)^12,x)
```

```
[Out] 3465/32/d*c^3/ln(F)^5/b^5*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+1/2/d*c
^11/ln(F)/b*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-11/4/d*c^9/ln(F)^2/b^
2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+99/8/d*c^7/ln(F)^3/b^3*F^(b*d^2
*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-10395/64/d*c/ln(F)^6/b^6*F^(b*d^2*x^2)*F^
(2*b*c*d*x)*F^(b*c^2)*F^a+1/2*d^10/ln(F)/b*x^11*F^(b*d^2*x^2)*F^(2*b*c*d*x)
*F^(b*c^2)*F^a-11/4*d^8/ln(F)^2/b^2*x^9*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^
2)*F^a+99/8*d^6/ln(F)^3/b^3*x^7*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-6
93/16*d^4/ln(F)^4/b^4*x^5*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+3465/32
*d^2/ln(F)^5/b^5*x^3*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-693/16/d*c^5
/ln(F)^4/b^4*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+11/2*c^10/ln(F)/b*x*
F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-99/4*c^8/ln(F)^2/b^2*x*F^(b*d^2*x
^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+10395/32*c^2/ln(F)^5/b^5*x*F^(b*d^2*x^2)*F^
(2*b*c*d*x)*F^(b*c^2)*F^a+693/8*c^6/ln(F)^3/b^3*x*F^(b*d^2*x^2)*F^(2*b*c*d*
x)*F^(b*c^2)*F^a-3465/16*c^4/ln(F)^4/b^4*x*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b
*c^2)*F^a-99*d*c^7/ln(F)^2/b^2*x^2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^
```

```
a-231*d^2*c^6/ln(F)^2/b^2*x^3*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-99*
d^6*c^2/ln(F)^2/b^2*x^7*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+2079/8*d^
4*c^2/ln(F)^3/b^3*x^5*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-3465/8*d^2*
c^2/ln(F)^4/b^4*x^3*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-99/4*d^7*c/ln
(F)^2/b^2*x^8*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+693/8*d^5*c/ln(F)^3
/b^3*x^6*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-3465/16*d^3*c/ln(F)^4/b^
4*x^4*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+10395/32*d*c/ln(F)^5/b^5*x^
2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+11/2*d^9*c/ln(F)/b*x^10*F^(b*d^
2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+55/2*d^8*c^2/ln(F)/b*x^9*F^(b*d^2*x^2)*F
^(2*b*c*d*x)*F^(b*c^2)*F^a+165/2*d^7*c^3/ln(F)/b*x^8*F^(b*d^2*x^2)*F^(2*b*c
*d*x)*F^(b*c^2)*F^a-231*d^5*c^3/ln(F)^2/b^2*x^6*F^(b*d^2*x^2)*F^(2*b*c*d*x)
*F^(b*c^2)*F^a+3465/8*d^3*c^3/ln(F)^3/b^3*x^4*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F
^(b*c^2)*F^a-3465/8*d*c^3/ln(F)^4/b^4*x^2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*
c^2)*F^a+165*d^6*c^4/ln(F)/b*x^7*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-
693/2*d^4*c^4/ln(F)^2/b^2*x^5*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+346
5/8*d^2*c^4/ln(F)^3/b^3*x^3*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+231*d
^5*c^5/ln(F)/b*x^6*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-693/2*d^3*c^5/
ln(F)^2/b^2*x^4*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+2079/8*d*c^5/ln(F
)^3/b^3*x^2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+231*d^4*c^6/ln(F)/b*x
^5*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+165*d^3*c^7/ln(F)/b*x^4*F^(b*d
^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+165/2*d^2*c^8/ln(F)/b*x^3*F^(b*d^2*x^2)
*F^(2*b*c*d*x)*F^(b*c^2)*F^a+55/2*d*c^9/ln(F)/b*x^2*F^(b*d^2*x^2)*F^(2*b*c*
d*x)*F^(b*c^2)*F^a-10395/64/ln(F)^6/b^6*x*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*
c^2)*F^a-10395/128/d/ln(F)^6/b^6*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*erf(-d*(-b*l
n(F))^(1/2)*x+b*c*ln(F)/(-b*ln(F))^(1/2))
```

maxima [B] time = 22.53, size = 6135, normalized size = 125.20

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^12,x, algorithm="maxima")
```

```
[Out] -6*(sqrt(pi)*(b*d^2*x + b*c*d)*b*c*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b
*d^2))) - 1)*log(F)^2/((b*log(F))^(3/2)*d^2*sqrt(-(b*d^2*x + b*c*d)^2*log(F
)/(b*d^2))) - F^((b*d^2*x + b*c*d)^2/(b*d^2))*b*log(F)/((b*log(F))^(3/2)*d)
)*F^a*c^11/sqrt(b*log(F)) + 33*(sqrt(pi)*(b*d^2*x + b*c*d)*b^2*c^2*(erf(sqr
t(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^3/((b*log(F))^(5/2)*d^3
*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 2*F^((b*d^2*x + b*c*d)^2/(b*d
^2))*b^2*c*log(F)^2/((b*log(F))^(5/2)*d^2) - (b*d^2*x + b*c*d)^3*gamma(3/2,
 -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F))^(5/2)*d^5*(-(b*d
^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)))*F^a*c^10*d/sqrt(b*log(F)) - 110*(sq
rt(pi)*(b*d^2*x + b*c*d)*b^3*c^3*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d
^2))) - 1)*log(F)^4/((b*log(F))^(7/2)*d^4*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/
(b*d^2))) - 3*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^3*c^2*log(F)^3/((b*log(F))^
```

(7/2)*d^3) - 3*(b*d^2*x + b*c*d)^3*b*c*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^4/((b*log(F))^(7/2)*d^6*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) + b^2*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^2/((b*log(F))^(7/2)*d^3))*F^a*c^9*d^2/sqrt(b*log(F)) + 495/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b^4*c^4*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^5/((b*log(F))^(9/2)*d^5*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 4*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^4*c^3*log(F)^4/((b*log(F))^(9/2)*d^4) - 6*(b*d^2*x + b*c*d)^3*b^2*c^2*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^5/((b*log(F))^(9/2)*d^7*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) + 4*b^3*c*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F))^(9/2)*d^4) - (b*d^2*x + b*c*d)^5*gamma(5/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^5/((b*log(F))^(9/2)*d^9*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(5/2)))*F^a*c^8*d^3/sqrt(b*log(F)) - 396*(sqrt(pi)*(b*d^2*x + b*c*d)*b^5*c^5*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^6/((b*log(F))^(11/2)*d^6*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 5*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^5*c^4*log(F)^5/((b*log(F))^(11/2)*d^5) - 10*(b*d^2*x + b*c*d)^3*b^3*c^3*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^6/((b*log(F))^(11/2)*d^8*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) + 10*b^4*c^2*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^4/((b*log(F))^(11/2)*d^5) - b^3*gamma(3, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F))^(11/2)*d^5) - 5*(b*d^2*x + b*c*d)^5*b*c*gamma(5/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^6/((b*log(F))^(11/2)*d^10*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(5/2)))*F^a*c^7*d^4/sqrt(b*log(F)) + 462*(sqrt(pi)*(b*d^2*x + b*c*d)*b^6*c^6*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^7/((b*log(F))^(13/2)*d^7*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 6*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^6*c^5*log(F)^6/((b*log(F))^(13/2)*d^6) - 15*(b*d^2*x + b*c*d)^3*b^4*c^4*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^7/((b*log(F))^(13/2)*d^9*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) + 20*b^5*c^3*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^5/((b*log(F))^(13/2)*d^6) - 6*b^4*c*gamma(3, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^4/((b*log(F))^(13/2)*d^6) - 15*(b*d^2*x + b*c*d)^5*b^2*c^2*gamma(5/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^7/((b*log(F))^(13/2)*d^11*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(5/2)) - (b*d^2*x + b*c*d)^7*gamma(7/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^7/((b*log(F))^(13/2)*d^13*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(7/2)))*F^a*c^6*d^5/sqrt(b*log(F)) - 396*(sqrt(pi)*(b*d^2*x + b*c*d)*b^7*c^7*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^8/((b*log(F))^(15/2)*d^8*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 7*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^7*c^6*log(F)^7/((b*log(F))^(15/2)*d^7) - 21*(b*d^2*x + b*c*d)^3*b^5*c^5*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^8/((b*log(F))^(15/2)*d^10*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) + 35*b^6*c^4*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^6/((b*log(F))^(15/2)*d^7) - 21*b^5*c^2*gamma(3, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^5/((b*log(F))^(15/2)*d^7) - 35*(b*d^2*x + b*c*d)^5*b^3*c^3*gamma(5/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^8/((b*log(F))^(15/2)*d^12*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(5/2)) +

b^4*gamma(4, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^4/((b*log(F))^(15/2)*d^7) - 7*(b*d^2*x + b*c*d)^7*b*c*gamma(7/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^8/((b*log(F))^(15/2)*d^14*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(7/2)))*F^a*c^5*d^6/sqrt(b*log(F)) + 495/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b^8*c^8*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^9/((b*log(F))^(17/2)*d^9*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 8*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^8*c^7*log(F)^8/((b*log(F))^(17/2)*d^8) - 28*(b*d^2*x + b*c*d)^3*b^6*c^6*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^9/((b*log(F))^(17/2)*d^11*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) + 56*b^7*c^5*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^7/((b*log(F))^(17/2)*d^8) - 56*b^6*c^3*gamma(3, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^6/((b*log(F))^(17/2)*d^8) - 70*(b*d^2*x + b*c*d)^5*b^4*c^4*gamma(5/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^9/((b*log(F))^(17/2)*d^13*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(5/2)) + 8*b^5*c*gamma(4, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^5/((b*log(F))^(17/2)*d^8) - 28*(b*d^2*x + b*c*d)^7*b^2*c^2*gamma(7/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^9/((b*log(F))^(17/2)*d^15*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(7/2)) - (b*d^2*x + b*c*d)^9*gamma(9/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^9/((b*log(F))^(17/2)*d^17*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(9/2)))*F^a*c^4*d^7/sqrt(b*log(F)) - 110*(sqrt(pi)*(b*d^2*x + b*c*d)*b^9*c^9*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^10/((b*log(F))^(19/2)*d^10*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 9*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^9*c^8*log(F)^9/((b*log(F))^(19/2)*d^9) - 36*(b*d^2*x + b*c*d)^3*b^7*c^7*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^10/((b*log(F))^(19/2)*d^12*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) + 84*b^8*c^6*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^8/((b*log(F))^(19/2)*d^9) - 126*b^7*c^4*gamma(3, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^7/((b*log(F))^(19/2)*d^9) - 126*(b*d^2*x + b*c*d)^5*b^5*c^5*gamma(5/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^10/((b*log(F))^(19/2)*d^14*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(5/2)) + 36*b^6*c^2*gamma(4, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^6/((b*log(F))^(19/2)*d^9) - 84*(b*d^2*x + b*c*d)^7*b^3*c^3*gamma(7/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^10/((b*log(F))^(19/2)*d^16*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(7/2)) - b^5*gamma(5, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^5/((b*log(F))^(19/2)*d^9) - 9*(b*d^2*x + b*c*d)^9*b*c*gamma(9/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^10/((b*log(F))^(19/2)*d^18*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(9/2)))*F^a*c^3*d^8/sqrt(b*log(F)) + 33*(sqrt(pi)*(b*d^2*x + b*c*d)*b^10*c^10*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^11/((b*log(F))^(21/2)*d^11*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 10*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^10*c^9*log(F)^10/((b*log(F))^(21/2)*d^10) - 45*(b*d^2*x + b*c*d)^3*b^8*c^8*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^11/((b*log(F))^(21/2)*d^13*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) + 120*b^9*c^7*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^9/((b*log(F))^(21/2)*d^10) - 252*b^8*c^5*gamma(3, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^8/((b*log(F))^(21/2)*d^10) - 210*(b*d^2*x + b*c*d)^5*b^6*c^6*gamma(5/2, -(b*d^2*x +

b*c*d)^2*log(F)/(b*d^2))*log(F)^11/((b*log(F))^(21/2)*d^15*(-(b*d^2*x + b*c
*d)^2*log(F)/(b*d^2))^(5/2)) + 120*b^7*c^3*gamma(4, -(b*d^2*x + b*c*d)^2*lo
g(F)/(b*d^2))*log(F)^7/((b*log(F))^(21/2)*d^10) - 210*(b*d^2*x + b*c*d)^7*b
^4*c^4*gamma(7/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^11/((b*log(F)
)^(21/2)*d^17*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(7/2)) - 10*b^6*c*gamma
(5, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^6/((b*log(F))^(21/2)*d^10)
- 45*(b*d^2*x + b*c*d)^9*b^2*c^2*gamma(9/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*
d^2))*log(F)^11/((b*log(F))^(21/2)*d^19*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2
))^(9/2)) - (b*d^2*x + b*c*d)^11*gamma(11/2, -(b*d^2*x + b*c*d)^2*log(F)/(b
*d^2))*log(F)^11/((b*log(F))^(21/2)*d^21*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^
2))^(11/2)))*F^a*c^2*d^9/sqrt(b*log(F)) - 6*(sqrt(pi)*(b*d^2*x + b*c*d)*b^1
1*c^11*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^12/((b*l
og(F))^(23/2)*d^12*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 11*F^((b*d^
2*x + b*c*d)^2/(b*d^2))*b^11*c^10*log(F)^11/((b*log(F))^(23/2)*d^11) - 55*(
b*d^2*x + b*c*d)^3*b^9*c^9*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*
log(F)^12/((b*log(F))^(23/2)*d^14*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/
2)) + 165*b^10*c^8*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^10/
((b*log(F))^(23/2)*d^11) - 462*b^9*c^6*gamma(3, -(b*d^2*x + b*c*d)^2*log(F)
/(b*d^2))*log(F)^9/((b*log(F))^(23/2)*d^11) - 330*(b*d^2*x + b*c*d)^5*b^7*c
^7*gamma(5/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^12/((b*log(F))^(2
3/2)*d^16*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(5/2)) + 330*b^8*c^4*gamma(
4, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^8/((b*log(F))^(23/2)*d^11) -
 462*(b*d^2*x + b*c*d)^7*b^5*c^5*gamma(7/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*
d^2))*log(F)^12/((b*log(F))^(23/2)*d^18*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2
))^(7/2)) - 55*b^7*c^2*gamma(5, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)
^7/((b*log(F))^(23/2)*d^11) - 165*(b*d^2*x + b*c*d)^9*b^3*c^3*gamma(9/2, -(
b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^12/((b*log(F))^(23/2)*d^20*(-(b*d
^2*x + b*c*d)^2*log(F)/(b*d^2))^(9/2)) + b^6*gamma(6, -(b*d^2*x + b*c*d)^2*
log(F)/(b*d^2))*log(F)^6/((b*log(F))^(23/2)*d^11) - 11*(b*d^2*x + b*c*d)^11
*b*c*gamma(11/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^12/((b*log(F))
^(23/2)*d^22*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(11/2)))*F^a*c*d^10/sqrt
(b*log(F)) + 1/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b^12*c^12*(erf(sqrt(-(b*d^2*x
+ b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^13/((b*log(F))^(25/2)*d^13*sqrt(-(b
*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 12*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^1
2*c^11*log(F)^12/((b*log(F))^(25/2)*d^12) - 66*(b*d^2*x + b*c*d)^3*b^10*c^1
0*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^13/((b*log(F))^(25
/2)*d^15*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) + 220*b^11*c^9*gamma(
2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^11/((b*log(F))^(25/2)*d^12)
- 792*b^10*c^7*gamma(3, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^10/((b*
log(F))^(25/2)*d^12) - 495*(b*d^2*x + b*c*d)^5*b^8*c^8*gamma(5/2, -(b*d^2*x
 + b*c*d)^2*log(F)/(b*d^2))*log(F)^13/((b*log(F))^(25/2)*d^17*(-(b*d^2*x +
b*c*d)^2*log(F)/(b*d^2))^(5/2)) + 792*b^9*c^5*gamma(4, -(b*d^2*x + b*c*d)^2
*log(F)/(b*d^2))*log(F)^9/((b*log(F))^(25/2)*d^12) - 924*(b*d^2*x + b*c*d)^
7*b^6*c^6*gamma(7/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^13/((b*log
(F))^(25/2)*d^19*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(7/2)) - 220*b^8*c^3

```
*gamma(5, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^8/((b*log(F))^(25/2)*
d^12) - 495*(b*d^2*x + b*c*d)^9*b^4*c^4*gamma(9/2, -(b*d^2*x + b*c*d)^2*log
(F)/(b*d^2))*log(F)^13/((b*log(F))^(25/2)*d^21*(-(b*d^2*x + b*c*d)^2*log(F)
/(b*d^2))^(9/2)) + 12*b^7*c*gamma(6, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*l
og(F)^7/((b*log(F))^(25/2)*d^12) - 66*(b*d^2*x + b*c*d)^11*b^2*c^2*gamma(11
/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^13/((b*log(F))^(25/2)*d^23*
(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(11/2)) - (b*d^2*x + b*c*d)^13*gamma(
13/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^13/((b*log(F))^(25/2)*d^2
5*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(13/2)))*F^a*d^11/sqrt(b*log(F)) +
1/2*sqrt(pi)*F^(b*c^2 + a)*c^12*erf(sqrt(-b*log(F))*d*x - b*c*log(F)/sqrt(-
b*log(F)))/(sqrt(-b*log(F))*F^(b*c^2)*d)
```

mupad [B] time = 4.02, size = 209, normalized size = 4.27

$$\frac{\frac{F^a\left(\frac{10395\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\,\ln(F)\,(c+d\,x)}{\sqrt{b\,\ln(F)}}\right)}{128}-\frac{10395\,F^{b\,(c+d\,x)^2}\,\sqrt{b\,\ln(F)}\,(c+d\,x)}{64}\right)}{\sqrt{b\,\ln(F)}}-\frac{693\,F^{a+b\,(c+d\,x)^2}\,b^2\,\ln(F)^2\,(c+d\,x)^5}{16}+\frac{99\,F^{a+b\,(c+d\,x)^2}\,b^3\,\ln(F)^3\,(c+d\,x)^7}{8}-\frac{11\,F^{a+b}\cdots}{\cdots}}{b^6\,d\,\ln(F)^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)*(c + d*x)^12,x)
```

```
[Out] ((F^a*((10395*pi^(1/2)*erfi((b*log(F)*(c + d*x))/(b*log(F))^(1/2)))/128 - (
10395*F^(b*(c + d*x)^2)*(b*log(F))^(1/2)*(c + d*x))/64))/(b*log(F))^(1/2) -
 (693*F^(a + b*(c + d*x)^2)*b^2*log(F)^2*(c + d*x)^5)/16 + (99*F^(a + b*(c
+ d*x)^2)*b^3*log(F)^3*(c + d*x)^7)/8 - (11*F^(a + b*(c + d*x)^2)*b^4*log(F
)^4*(c + d*x)^9)/4 + (F^(a + b*(c + d*x)^2)*b^5*log(F)^5*(c + d*x)^11)/2 +
(3465*F^(a + b*(c + d*x)^2)*b*log(F)*(c + d*x)^3)/32)/(b^6*d*log(F)^6)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)*(d*x+c)**12,x)
```

```
[Out] Timed out
```

3.268 $\int F^{a+b(c+dx)^2}(c+dx)^{10}\,dx$

Optimal. Leaf size=49

$$-\frac{F^a(c+dx)^{11}\Gamma\left(\frac{11}{2},-b(c+dx)^2\log(F)\right)}{2d\left(-b\log(F)(c+dx)^2\right)^{11/2}}$$

```
[Out] -1/2*F^a*(d*x+c)^11*(1048576/61836869254970658257624840625*GAMMA(51/2,-b*(d
*x+c)^2*ln(F))-1048576/61836869254970658257624840625*(-b*(d*x+c)^2*ln(F))^(
49/2)*exp(b*(d*x+c)^2*ln(F))-524288/1261976923570829760359690625*(-b*(d*x+c
)^2*ln(F))^(47/2)*exp(b*(d*x+c)^2*ln(F))-262144/26850572841932548092759375*
(-b*(d*x+c)^2*ln(F))^(45/2)*exp(b*(d*x+c)^2*ln(F))-131072/596679396487389957616875*(-b*(d*x+c)^2*ln(F))^(43/2)*exp(b*(d*x+c)^2*ln(F))-65536/1387626503
4590464130625*(-b*(d*x+c)^2*ln(F))^(41/2)*exp(b*(d*x+c)^2*ln(F))-32768/3384
45488648547905625*(-b*(d*x+c)^2*ln(F))^(39/2)*exp(b*(d*x+c)^2*ln(F))-16384/
8678089452526869375*(-b*(d*x+c)^2*ln(F))^(37/2)*exp(b*(d*x+c)^2*ln(F))-8192
/234542958176401875*(-b*(d*x+c)^2*ln(F))^(35/2)*exp(b*(d*x+c)^2*ln(F))-4096
/6701227376468625*(-b*(d*x+c)^2*ln(F))^(33/2)*exp(b*(d*x+c)^2*ln(F))-2048/2
03067496256625*(-b*(d*x+c)^2*ln(F))^(31/2)*exp(b*(d*x+c)^2*ln(F))-1024/6550
564395375*(-b*(d*x+c)^2*ln(F))^(29/2)*exp(b*(d*x+c)^2*ln(F))-512/2258815308
75*(-b*(d*x+c)^2*ln(F))^(27/2)*exp(b*(d*x+c)^2*ln(F))-256/8365982625*(-b*(d
*x+c)^2*ln(F))^(25/2)*exp(b*(d*x+c)^2*ln(F))-128/334639305*(-b*(d*x+c)^2*ln
(F))^(23/2)*exp(b*(d*x+c)^2*ln(F))-64/14549535*(-b*(d*x+c)^2*ln(F))^(21/2)*
exp(b*(d*x+c)^2*ln(F))-32/692835*(-b*(d*x+c)^2*ln(F))^(19/2)*exp(b*(d*x+c)^
2*ln(F))-16/36465*(-b*(d*x+c)^2*ln(F))^(17/2)*exp(b*(d*x+c)^2*ln(F))-8/2145
*(-b*(d*x+c)^2*ln(F))^(15/2)*exp(b*(d*x+c)^2*ln(F))-4/143*(-b*(d*x+c)^2*ln(
F))^(13/2)*exp(b*(d*x+c)^2*ln(F))-2/11*(-b*(d*x+c)^2*ln(F))^(11/2)*exp(b*(d
*x+c)^2*ln(F)))/d/(-b*(d*x+c)^2*ln(F))^(11/2)
```

Rubi [A] time = 0.07, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2218}

$$-\frac{F^a(c+dx)^{11}\text{Gamma}\left(\frac{11}{2},-b\log(F)(c+dx)^2\right)}{2d\left(-b\log(F)(c+dx)^2\right)^{11/2}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)*(c + d*x)^10,x]
```

```
[Out] -(F^a*(c + d*x)^11*Gamma[11/2, -(b*(c + d*x)^2*Log[F])])/(2*d*(-(b*(c + d*x
)^2*Log[F]))^(11/2))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+b(c+dx)^2}(c+dx)^{10}\,dx = -\frac{F^a(c+dx)^{11}\Gamma\left(\frac{11}{2},-b(c+dx)^2\log(F)\right)}{2d\left(-b(c+dx)^2\log(F)\right)^{11/2}}$$

Mathematica [A] time = 0.03, size = 49, normalized size = 1.00

$$-\frac{F^a(c+dx)^{11}\Gamma\left(\frac{11}{2},-b(c+dx)^2\log(F)\right)}{2d\left(-b\log(F)(c+dx)^2\right)^{11/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)*(c + d*x)^10,x]
```

```
[Out] -1/2*(F^a*(c + d*x)^11*Gamma[11/2, -(b*(c + d*x)^2*Log[F])])/(d*(-(b*(c + d
*x)^2*Log[F]))^(11/2))
```

fricas [A] time = 0.53, size = 456, normalized size = 9.31

$$945\sqrt{\pi}\sqrt{-bd^2\log(F)}F^a\operatorname{erf}\left(\frac{\sqrt{-bd^2\log(F)}(dx+c)}{d}\right)+2\left(16\left(b^5d^{10}x^9+9b^5cd^9x^8+36b^5c^2d^8x^7+84b^5c^3d^7x^6+126b\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^10,x, algorithm="fricas")
```

```
[Out] 1/64*(945*sqrt(pi)*sqrt(-b*d^2*log(F))*F^a*erf(sqrt(-b*d^2*log(F))*(d*x + c
)/d) + 2*(16*(b^5*d^10*x^9 + 9*b^5*c*d^9*x^8 + 36*b^5*c^2*d^8*x^7 + 84*b^5*
c^3*d^7*x^6 + 126*b^5*c^4*d^6*x^5 + 126*b^5*c^5*d^5*x^4 + 84*b^5*c^6*d^4*x^
3 + 36*b^5*c^7*d^3*x^2 + 9*b^5*c^8*d^2*x + b^5*c^9*d)*log(F)^5 - 72*(b^4*d^
8*x^7 + 7*b^4*c*d^7*x^6 + 21*b^4*c^2*d^6*x^5 + 35*b^4*c^3*d^5*x^4 + 35*b^4*
c^4*d^4*x^3 + 21*b^4*c^5*d^3*x^2 + 7*b^4*c^6*d^2*x + b^4*c^7*d)*log(F)^4 +
252*(b^3*d^6*x^5 + 5*b^3*c*d^5*x^4 + 10*b^3*c^2*d^4*x^3 + 10*b^3*c^3*d^3*x^
```

```
2 + 5*b^3*c^4*d^2*x + b^3*c^5*d)*log(F)^3 - 630*(b^2*d^4*x^3 + 3*b^2*c*d^3*
x^2 + 3*b^2*c^2*d^2*x + b^2*c^3*d)*log(F)^2 + 945*(b*d^2*x + b*c*d)*log(F))
*F^(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a))/(b^6*d^2*log(F)^6)
```

giac [A] time = 0.35, size = 174, normalized size = 3.55

$$\frac{\left(16\,b^4d^8\left(x+\frac{c}{d}\right)^9\log(F)^4-72\,b^3d^6\left(x+\frac{c}{d}\right)^7\log(F)^3+252\,b^2d^4\left(x+\frac{c}{d}\right)^5\log(F)^2-630\,bd^2\left(x+\frac{c}{d}\right)^3\log(F)+945}{32\,b^5\log(F)^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^10,x, algorithm="giac")
```

```
[Out] 1/32*(16*b^4*d^8*(x + c/d)^9*log(F)^4 - 72*b^3*d^6*(x + c/d)^7*log(F)^3 + 2
52*b^2*d^4*(x + c/d)^5*log(F)^2 - 630*b*d^2*(x + c/d)^3*log(F) + 945*x + 94
5*c/d)*e^(b*d^2*x^2*log(F) + 2*b*c*d*x*log(F) + b*c^2*log(F) + a*log(F))/(b
^5*log(F)^5) + 945/64*sqrt(pi)*F^a*erf(-sqrt(-b*log(F))*d*(x + c/d))/(sqrt(
-b*log(F))*b^5*d*log(F)^5)
```

maple [B] time = 0.25, size = 1359, normalized size = 27.73

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+(d*x+c)^2*b)*(d*x+c)^10,x)
```

```
[Out] 1/2*d^8/ln(F)/b*x^9*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+63/8*d^4/ln(F
)^3/b^3*x^5*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-315/16*d^2/ln(F)^4/b^
4*x^3*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-9/4*d^6/ln(F)^2/b^2*x^7*F^(
b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+945/32/d*c/ln(F)^5/b^5*F^(b*d^2*x^2)
*F^(2*b*c*d*x)*F^(b*c^2)*F^a-315/16/d*c^3/ln(F)^4/b^4*F^(b*d^2*x^2)*F^(2*b*
c*d*x)*F^(b*c^2)*F^a+1/2/d*c^9/ln(F)/b*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2
)*F^a-9/4/d*c^7/ln(F)^2/b^2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+63/8/
d*c^5/ln(F)^3/b^3*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+315/8*c^4/ln(F)
^3/b^3*x*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-945/16*c^2/ln(F)^4/b^4*x
*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+9/2*c^8/ln(F)/b*x*F^(b*d^2*x^2)*
F^(2*b*c*d*x)*F^(b*c^2)*F^a-63/4*c^6/ln(F)^2/b^2*x*F^(b*d^2*x^2)*F^(2*b*c*d
*x)*F^(b*c^2)*F^a+63*d^3*c^5/ln(F)/b*x^4*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c
^2)*F^a+42*d^2*c^6/ln(F)/b*x^3*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+18
*d*c^7/ln(F)/b*x^2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-189/4*d*c^5/ln
(F)^2/b^2*x^2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-315/4*d^2*c^4/ln(F)
^2/b^2*x^3*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+42*d^5*c^3/ln(F)/b*x^6
*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-315/4*d^3*c^3/ln(F)^2/b^2*x^4*F^
(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+315/4*d*c^3/ln(F)^3/b^3*x^2*F^(b*d^
```

```
2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-189/4*d^4*c^2/ln(F)^2/b^2*x^5*F^(b*d^2*x
^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+315/4*d^2*c^2/ln(F)^3/b^3*x^3*F^(b*d^2*x^2)
*F^(2*b*c*d*x)*F^(b*c^2)*F^a+9/2*d^7*c/ln(F)/b*x^8*F^(b*d^2*x^2)*F^(2*b*c*d
*x)*F^(b*c^2)*F^a+63*d^4*c^4/ln(F)/b*x^5*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c
^2)*F^a+18*d^6*c^2/ln(F)/b*x^7*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-63
/4*d^5*c/ln(F)^2/b^2*x^6*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+315/8*d^
3*c/ln(F)^3/b^3*x^4*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-945/16*d*c/ln
(F)^4/b^4*x^2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+945/32/ln(F)^5/b^5*
x*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+945/64/d/ln(F)^5/b^5*Pi^(1/2)*F
^a/(-b*ln(F))^(1/2)*erf(1/(-b*ln(F))^(1/2)*b*c*ln(F)-(-b*ln(F))^(1/2)*d*x)
```

maxima [B] time = 16.75, size = 4471, normalized size = 91.24

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^10,x, algorithm="maxima")
```

```
[Out] -5*(sqrt(pi)*(b*d^2*x + b*c*d)*b*c*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b
*d^2))) - 1)*log(F)^2/((b*log(F))^(3/2)*d^2*sqrt(-(b*d^2*x + b*c*d)^2*log(F
)/(b*d^2))) - F^((b*d^2*x + b*c*d)^2/(b*d^2))*b*log(F)/((b*log(F))^(3/2)*d)
)*F^a*c^9/sqrt(b*log(F)) + 45/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b^2*c^2*(erf(sq
rt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^3/((b*log(F))^(5/2)*d^
3*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 2*F^((b*d^2*x + b*c*d)^2/(b*
d^2))*b^2*c*log(F)^2/((b*log(F))^(5/2)*d^2) - (b*d^2*x + b*c*d)^3*gamma(3/2
, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F))^(5/2)*d^5*(-(b*
d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)))*F^a*c^8*d/sqrt(b*log(F)) - 60*(sqr
t(pi)*(b*d^2*x + b*c*d)*b^3*c^3*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^
2))) - 1)*log(F)^4/((b*log(F))^(7/2)*d^4*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(
b*d^2))) - 3*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^3*c^2*log(F)^3/((b*log(F))^(
7/2)*d^3) - 3*(b*d^2*x + b*c*d)^3*b*c*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F
)/(b*d^2))*log(F)^4/((b*log(F))^(7/2)*d^6*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d
^2))^(3/2)) + b^2*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^2/((
b*log(F))^(7/2)*d^3))*F^a*c^7*d^2/sqrt(b*log(F)) + 105*(sqrt(pi)*(b*d^2*x +
 b*c*d)*b^4*c^4*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)
^5/((b*log(F))^(9/2)*d^5*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 4*F^(
(b*d^2*x + b*c*d)^2/(b*d^2))*b^4*c^3*log(F)^4/((b*log(F))^(9/2)*d^4) - 6*(b
*d^2*x + b*c*d)^3*b^2*c^2*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*l
og(F)^5/((b*log(F))^(9/2)*d^7*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2))
+ 4*b^3*c*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F)
)^(9/2)*d^4) - (b*d^2*x + b*c*d)^5*gamma(5/2, -(b*d^2*x + b*c*d)^2*log(F)/(
b*d^2))*log(F)^5/((b*log(F))^(9/2)*d^9*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2)
)^(5/2)))*F^a*c^6*d^3/sqrt(b*log(F)) - 126*(sqrt(pi)*(b*d^2*x + b*c*d)*b^5*
c^5*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^6/((b*log(F
))^(11/2)*d^6*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 5*F^((b*d^2*x +
```

```
b*c*d)^2/(b*d^2))*b^5*c^4*log(F)^5/((b*log(F))^(11/2)*d^5) - 10*(b*d^2*x +
b*c*d)^3*b^3*c^3*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^6/(
(b*log(F))^(11/2)*d^8*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) + 10*b^4
*c^2*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^4/((b*log(F))^(11
/2)*d^5) - b^3*gamma(3, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*l
og(F))^(11/2)*d^5) - 5*(b*d^2*x + b*c*d)^5*b*c*gamma(5/2, -(b*d^2*x + b*c*d
)^2*log(F)/(b*d^2))*log(F)^6/((b*log(F))^(11/2)*d^10*(-(b*d^2*x + b*c*d)^2*
log(F)/(b*d^2))^(5/2)))*F^a*c^5*d^4/sqrt(b*log(F)) + 105*(sqrt(pi)*(b*d^2*x
 + b*c*d)*b^6*c^6*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(
F)^7/((b*log(F))^(13/2)*d^7*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 6*
F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^6*c^5*log(F)^6/((b*log(F))^(13/2)*d^6) -
15*(b*d^2*x + b*c*d)^3*b^4*c^4*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^
2))*log(F)^7/((b*log(F))^(13/2)*d^9*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(
3/2)) + 20*b^5*c^3*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^5/(
(b*log(F))^(13/2)*d^6) - 6*b^4*c*gamma(3, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^
2))*log(F)^4/((b*log(F))^(13/2)*d^6) - 15*(b*d^2*x + b*c*d)^5*b^2*c^2*gamma
(5/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^7/((b*log(F))^(13/2)*d^11
*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(5/2)) - (b*d^2*x + b*c*d)^7*gamma(7
/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^7/((b*log(F))^(13/2)*d^13*(
-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(7/2)))*F^a*c^4*d^5/sqrt(b*log(F)) - 6
0*(sqrt(pi)*(b*d^2*x + b*c*d)*b^7*c^7*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)
/(b*d^2))) - 1)*log(F)^8/((b*log(F))^(15/2)*d^8*sqrt(-(b*d^2*x + b*c*d)^2*l
og(F)/(b*d^2))) - 7*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^7*c^6*log(F)^7/((b*lo
g(F))^(15/2)*d^7) - 21*(b*d^2*x + b*c*d)^3*b^5*c^5*gamma(3/2, -(b*d^2*x + b
*c*d)^2*log(F)/(b*d^2))*log(F)^8/((b*log(F))^(15/2)*d^10*(-(b*d^2*x + b*c*d
)^2*log(F)/(b*d^2))^(3/2)) + 35*b^6*c^4*gamma(2, -(b*d^2*x + b*c*d)^2*log(F
)/(b*d^2))*log(F)^6/((b*log(F))^(15/2)*d^7) - 21*b^5*c^2*gamma(3, -(b*d^2*x
 + b*c*d)^2*log(F)/(b*d^2))*log(F)^5/((b*log(F))^(15/2)*d^7) - 35*(b*d^2*x
+ b*c*d)^5*b^3*c^3*gamma(5/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^8
/((b*log(F))^(15/2)*d^12*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(5/2)) + b^4
*gamma(4, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^4/((b*log(F))^(15/2)*
d^7) - 7*(b*d^2*x + b*c*d)^7*b*c*gamma(7/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*
d^2))*log(F)^8/((b*log(F))^(15/2)*d^14*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2)
)^(7/2)))*F^a*c^3*d^6/sqrt(b*log(F)) + 45/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b^8
*c^8*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^9/((b*log(
F))^(17/2)*d^9*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 8*F^((b*d^2*x +
 b*c*d)^2/(b*d^2))*b^8*c^7*log(F)^8/((b*log(F))^(17/2)*d^8) - 28*(b*d^2*x +
 b*c*d)^3*b^6*c^6*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^9/
((b*log(F))^(17/2)*d^11*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) + 56*b
^7*c^5*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^7/((b*log(F))^(
17/2)*d^8) - 56*b^6*c^3*gamma(3, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F
)^6/((b*log(F))^(17/2)*d^8) - 70*(b*d^2*x + b*c*d)^5*b^4*c^4*gamma(5/2, -(b
*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^9/((b*log(F))^(17/2)*d^13*(-(b*d^2
*x + b*c*d)^2*log(F)/(b*d^2))^(5/2)) + 8*b^5*c*gamma(4, -(b*d^2*x + b*c*d)^
2*log(F)/(b*d^2))*log(F)^5/((b*log(F))^(17/2)*d^8) - 28*(b*d^2*x + b*c*d)^7
```

```
*b^2*c^2*gamma(7/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^9/((b*log(F
))^(17/2)*d^15*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(7/2)) - (b*d^2*x + b*
c*d)^9*gamma(9/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^9/((b*log(F))
^(17/2)*d^17*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(9/2)))*F^a*c^2*d^7/sqrt
(b*log(F)) - 5*(sqrt(pi)*(b*d^2*x + b*c*d)*b^9*c^9*(erf(sqrt(-(b*d^2*x + b*
c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^10/((b*log(F))^(19/2)*d^10*sqrt(-(b*d^2
*x + b*c*d)^2*log(F)/(b*d^2))) - 9*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^9*c^8*
log(F)^9/((b*log(F))^(19/2)*d^9) - 36*(b*d^2*x + b*c*d)^3*b^7*c^7*gamma(3/2
, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^10/((b*log(F))^(19/2)*d^12*(-
(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) + 84*b^8*c^6*gamma(2, -(b*d^2*x
+ b*c*d)^2*log(F)/(b*d^2))*log(F)^8/((b*log(F))^(19/2)*d^9) - 126*b^7*c^4*g
amma(3, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^7/((b*log(F))^(19/2)*d^
9) - 126*(b*d^2*x + b*c*d)^5*b^5*c^5*gamma(5/2, -(b*d^2*x + b*c*d)^2*log(F)
/(b*d^2))*log(F)^10/((b*log(F))^(19/2)*d^14*(-(b*d^2*x + b*c*d)^2*log(F)/(b
*d^2))^(5/2)) + 36*b^6*c^2*gamma(4, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*lo
g(F)^6/((b*log(F))^(19/2)*d^9) - 84*(b*d^2*x + b*c*d)^7*b^3*c^3*gamma(7/2,
-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^10/((b*log(F))^(19/2)*d^16*(-(b
*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(7/2)) - b^5*gamma(5, -(b*d^2*x + b*c*d)^
2*log(F)/(b*d^2))*log(F)^5/((b*log(F))^(19/2)*d^9) - 9*(b*d^2*x + b*c*d)^9*
b*c*gamma(9/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^10/((b*log(F))^(
19/2)*d^18*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(9/2)))*F^a*c*d^8/sqrt(b*l
og(F)) + 1/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b^10*c^10*(erf(sqrt(-(b*d^2*x + b*
c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^11/((b*log(F))^(21/2)*d^11*sqrt(-(b*d^2
*x + b*c*d)^2*log(F)/(b*d^2))) - 10*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^10*c^
9*log(F)^10/((b*log(F))^(21/2)*d^10) - 45*(b*d^2*x + b*c*d)^3*b^8*c^8*gamma
(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^11/((b*log(F))^(21/2)*d^1
3*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) + 120*b^9*c^7*gamma(2, -(b*d
^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^9/((b*log(F))^(21/2)*d^10) - 252*b^8
*c^5*gamma(3, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^8/((b*log(F))^(21
/2)*d^10) - 210*(b*d^2*x + b*c*d)^5*b^6*c^6*gamma(5/2, -(b*d^2*x + b*c*d)^2
*log(F)/(b*d^2))*log(F)^11/((b*log(F))^(21/2)*d^15*(-(b*d^2*x + b*c*d)^2*lo
g(F)/(b*d^2))^(5/2)) + 120*b^7*c^3*gamma(4, -(b*d^2*x + b*c*d)^2*log(F)/(b*
d^2))*log(F)^7/((b*log(F))^(21/2)*d^10) - 210*(b*d^2*x + b*c*d)^7*b^4*c^4*g
amma(7/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^11/((b*log(F))^(21/2)
*d^17*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(7/2)) - 10*b^6*c*gamma(5, -(b*
d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^6/((b*log(F))^(21/2)*d^10) - 45*(b*
d^2*x + b*c*d)^9*b^2*c^2*gamma(9/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*lo
g(F)^11/((b*log(F))^(21/2)*d^19*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(9/2)
) - (b*d^2*x + b*c*d)^11*gamma(11/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*l
og(F)^11/((b*log(F))^(21/2)*d^21*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(11/
2)))*F^a*d^9/sqrt(b*log(F)) + 1/2*sqrt(pi)*F^(b*c^2 + a)*c^10*erf(sqrt(-b*l
og(F))*d*x - b*c*log(F)/sqrt(-b*log(F)))/(sqrt(-b*log(F))*F^(b*c^2)*d)
```

mupad [B] time = 4.13, size = 730, normalized size = 14.90

$$\frac{F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,\left(\frac{b^4\,c^9\,\ln(F)^4}{2}-\frac{9\,b^3\,c^7\,\ln(F)^3}{4}+\frac{63\,b^2\,c^5\,\ln(F)^2}{8}-\frac{315\,b\,c^3\,\ln(F)}{16}+\frac{945\,c}{32}\right)}{b^5\,d\,\ln(F)^5}-\frac{945\,F^a\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\,x\,\ln(F)\,d^2+b\,c}{\sqrt{b\,d^2\,\ln(F}}\right.}{64\,b^5\,\ln(F)^5\,\sqrt{b\,d^2\,\ln(F}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)*(c + d*x)^10,x)
```

```
[Out] (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*((945*c)/32 - (315*b*c^3*log(F))
/16 + (63*b^2*c^5*log(F)^2)/8 - (9*b^3*c^7*log(F)^3)/4 + (b^4*c^9*log(F)^4)
/2))/(b^5*d*log(F)^5) - (945*F^a*pi^(1/2)*erfi((b*c*d*log(F) + b*d^2*x*log(
F))/(b*d^2*log(F))^(1/2)))/(64*b^5*log(F)^5*(b*d^2*log(F))^(1/2)) + (63*F^(
b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*x^4*(5*c*d^3 + 8*b^2*c^5*d^3*log(F)^
2 - 10*b*c^3*d^3*log(F)))/(8*b^3*log(F)^3) + (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F
^(2*b*c*d*x)*d^8*x^9)/(2*b*log(F)) - (9*F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*
c*d*x)*x^2*(105*c*d + 84*b^2*c^5*d*log(F)^2 - 32*b^3*c^7*d*log(F)^3 - 140*b
*c^3*d*log(F)))/(16*b^4*log(F)^4) + (63*F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*
c*d*x)*x^5*(d^4 + 8*b^2*c^4*d^4*log(F)^2 - 6*b*c^2*d^4*log(F)))/(8*b^3*log(
F)^3) - (21*F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*x^6*(3*c*d^5 - 8*b*c^
3*d^5*log(F)))/(4*b^2*log(F)^2) - (21*F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*
d*x)*x^3*(15*d^2 + 60*b^2*c^4*d^2*log(F)^2 - 32*b^3*c^6*d^2*log(F)^3 - 60*b
*c^2*d^2*log(F)))/(16*b^4*log(F)^4) + (9*F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b
*c*d*x)*x*(140*b^2*c^4*log(F)^2 - 210*b*c^2*log(F) - 56*b^3*c^6*log(F)^3 +
16*b^4*c^8*log(F)^4 + 105))/(32*b^5*log(F)^5) + (9*F^(b*d^2*x^2)*F^a*F^(b*c
^2)*F^(2*b*c*d*x)*c*d^7*x^8)/(2*b*log(F)) + (9*F^(b*d^2*x^2)*F^a*F^(b*c^2)*
F^(2*b*c*d*x)*d^6*x^7*(8*b*c^2*log(F) - 1))/(4*b^2*log(F)^2)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)*(d*x+c)**10,x)
```

```
[Out] Timed out
```

3.269 $\int F^{a+b(c+dx)^2}(c+dx)^8\,dx$

Optimal. Leaf size=179

$$\frac{105\sqrt{\pi}F^a\operatorname{erfi}\left(\sqrt{b}\sqrt{\log(F)}(c+dx)\right)}{32b^{9/2}d\log^{\frac{9}{2}}(F)}-\frac{105(c+dx)F^{a+b(c+dx)^2}}{16b^4d\log^4(F)}+\frac{35(c+dx)^3F^{a+b(c+dx)^2}}{8b^3d\log^3(F)}-\frac{7(c+dx)^5F^{a+b(c+dx)^2}}{4b^2d\log^2(F)}+\frac{(c+\ldots}{}$$

```
[Out] -105/16*F^(a+b*(d*x+c)^2)*(d*x+c)/b^4/d/ln(F)^4+35/8*F^(a+b*(d*x+c)^2)*(d*x
+c)^3/b^3/d/ln(F)^3-7/4*F^(a+b*(d*x+c)^2)*(d*x+c)^5/b^2/d/ln(F)^2+1/2*F^(a+
b*(d*x+c)^2)*(d*x+c)^7/b/d/ln(F)+105/32*F^a*erfi((d*x+c)*b^(1/2)*ln(F)^(1/2
))*Pi^(1/2)/b^(9/2)/d/ln(F)^(9/2)
```

Rubi [A] time = 0.33, antiderivative size = 179, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2212, 2204}

$$\frac{105\sqrt{\pi}F^a\operatorname{Erfi}\left(\sqrt{b}\sqrt{\log(F)}(c+dx)\right)}{32b^{9/2}d\log^{\frac{9}{2}}(F)}-\frac{7(c+dx)^5F^{a+b(c+dx)^2}}{4b^2d\log^2(F)}+\frac{35(c+dx)^3F^{a+b(c+dx)^2}}{8b^3d\log^3(F)}-\frac{105(c+dx)F^{a+b(c+dx)^2}}{16b^4d\log^4(F)}+\frac{(c+\ldots}{}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)*(c + d*x)^8,x]
```

```
[Out] (105*F^a*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]])/(32*b^(9/2)*d*Log[F
]^(9/2)) - (105*F^(a + b*(c + d*x)^2)*(c + d*x))/(16*b^4*d*Log[F]^4) + (35*
F^(a + b*(c + d*x)^2)*(c + d*x)^3)/(8*b^3*d*Log[F]^3) - (7*F^(a + b*(c + d*
x)^2)*(c + d*x)^5)/(4*b^2*d*Log[F]^2) + (F^(a + b*(c + d*x)^2)*(c + d*x)^7)
/(2*b*d*Log[F])
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int F^{a+b(c+dx)^2}(c+dx)^8\,dx = \frac{F^{a+b(c+dx)^2}(c+dx)^7}{2bd\log(F)} - \frac{7\int F^{a+b(c+dx)^2}(c+dx)^6\,dx}{2b\log(F)}$$

$$= -\frac{7F^{a+b(c+dx)^2}(c+dx)^5}{4b^2d\log^2(F)} + \frac{F^{a+b(c+dx)^2}(c+dx)^7}{2bd\log(F)} + \frac{35\int F^{a+b(c+dx)^2}(c+dx)^4\,dx}{4b^2\log^2(F)}$$

$$= \frac{35F^{a+b(c+dx)^2}(c+dx)^3}{8b^3d\log^3(F)} - \frac{7F^{a+b(c+dx)^2}(c+dx)^5}{4b^2d\log^2(F)} + \frac{F^{a+b(c+dx)^2}(c+dx)^7}{2bd\log(F)} - \frac{105\int F^{a+b(c\cdot}}{8b^3}$$

$$= -\frac{105F^{a+b(c+dx)^2}(c+dx)}{16b^4d\log^4(F)} + \frac{35F^{a+b(c+dx)^2}(c+dx)^3}{8b^3d\log^3(F)} - \frac{7F^{a+b(c+dx)^2}(c+dx)^5}{4b^2d\log^2(F)} + \frac{F^{a+b(c+d}}{2bd}$$

$$= \frac{105F^a\sqrt{\pi}\,\text{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)}{32b^{9/2}d\log^{\frac{9}{2}}(F)} - \frac{105F^{a+b(c+dx)^2}(c+dx)}{16b^4d\log^4(F)} + \frac{35F^{a+b(c+dx)^2}(c+d}{8b^3d\log^3(F)}$$

Mathematica [A] time = 0.38, size = 153, normalized size = 0.85

$$\frac{F^a\left(\frac{105\sqrt{\pi}\,\text{erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{b^{7/2}\log^{\frac{7}{2}}(F)} - \frac{210(c+dx)F^{b(c+dx)^2}}{b^3\log^3(F)} + \frac{140(c+dx)^3F^{b(c+dx)^2}}{b^2\log^2(F)} + 16(c+dx)^7F^{b(c+dx)^2} - \frac{56(c+dx)^5F^{b(c+dx)^2}}{b\log(F)}\right)}{32bd\log(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)*(c + d*x)^8,x]
```

```
[Out] (F^a*(16*F^(b*(c + d*x)^2)*(c + d*x)^7 + (105*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*
x)*Sqrt[Log[F]]])/(b^(7/2)*Log[F]^(7/2)) - (210*F^(b*(c + d*x)^2)*(c + d*x)
)/(b^3*Log[F]^3) + (140*F^(b*(c + d*x)^2)*(c + d*x)^3)/(b^2*Log[F]^2) - (56
*F^(b*(c + d*x)^2)*(c + d*x)^5)/(b*Log[F])))/(32*b*d*Log[F])
```

fricas [B] time = 0.62, size = 323, normalized size = 1.80

$$-\frac{105\sqrt{\pi}\sqrt{-bd^2\log(F)}\,F^a\,\text{erf}\left(\frac{\sqrt{-bd^2\log(F)}\,(dx+c)}{d}\right) - 2\left(8\left(b^4d^8x^7 + 7\,b^4cd^7x^6 + 21\,b^4c^2d^6x^5 + 35\,b^4c^3d^5x^4 + 35\,b^4\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^8,x, algorithm="fricas")
```

```
[Out] -1/32*(105*sqrt(pi)*sqrt(-b*d^2*log(F))*F^a*erf(sqrt(-b*d^2*log(F))*(d*x +
c)/d) - 2*(8*(b^4*d^8*x^7 + 7*b^4*c*d^7*x^6 + 21*b^4*c^2*d^6*x^5 + 35*b^4*c
```

```
^3*d^5*x^4 + 35*b^4*c^4*d^4*x^3 + 21*b^4*c^5*d^3*x^2 + 7*b^4*c^6*d^2*x + b^
4*c^7*d)*log(F)^4 - 28*(b^3*d^6*x^5 + 5*b^3*c*d^5*x^4 + 10*b^3*c^2*d^4*x^3
+ 10*b^3*c^3*d^3*x^2 + 5*b^3*c^4*d^2*x + b^3*c^5*d)*log(F)^3 + 70*(b^2*d^4*
x^3 + 3*b^2*c*d^3*x^2 + 3*b^2*c^2*d^2*x + b^2*c^3*d)*log(F)^2 - 105*(b*d^2*
x + b*c*d)*log(F))*F^(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a))/(b^5*d^2*log(F)^5
)
```

giac [A] time = 0.31, size = 153, normalized size = 0.85

$$\frac{\left(8\,b^3d^6\left(x+\frac{c}{d}\right)^7\log(F)^3-28\,b^2d^4\left(x+\frac{c}{d}\right)^5\log(F)^2+70\,bd^2\left(x+\frac{c}{d}\right)^3\log(F)-105\,x-\frac{105\,c}{d}\right)e^{\left(bd^2x^2\log(F)+2\,bcdx\log(F)\right.}}{16\,b^4\log(F)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^8,x, algorithm="giac")
```

```
[Out] 1/16*(8*b^3*d^6*(x + c/d)^7*log(F)^3 - 28*b^2*d^4*(x + c/d)^5*log(F)^2 + 70
*b*d^2*(x + c/d)^3*log(F) - 105*x - 105*c/d)*e^(b*d^2*x^2*log(F) + 2*b*c*d*
x*log(F) + b*c^2*log(F) + a*log(F))/(b^4*log(F)^4) - 105/32*sqrt(pi)*F^a*er
f(-sqrt(-b*log(F))*d*(x + c/d))/(sqrt(-b*log(F))*b^4*d*log(F)^4)
```

maple [B] time = 0.16, size = 914, normalized size = 5.11

$$\frac{d^6x^7F^aF^{b\,c^2}F^{b\,d^2x^2}F^{2bcdx}}{2b\ln(F)}+\frac{7c\,d^5x^6F^aF^{b\,c^2}F^{b\,d^2x^2}F^{2bcdx}}{2b\ln(F)}+\frac{21c^2d^4x^5F^aF^{b\,c^2}F^{b\,d^2x^2}F^{2bcdx}}{2b\ln(F)}+\frac{35c^3d^3x^4F^aF^{b\,c^2}F^{b\,d^2x^2}F^{2bcdx}}{2b\ln(F)}+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+(d*x+c)^2*b)*(d*x+c)^8,x)
```

```
[Out] -35/2*d*c^3/ln(F)^2/b^2*x^2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-35/2*
d^2*c^2/ln(F)^2/b^2*x^3*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+35/2*d^3*
c^3/ln(F)/b*x^4*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+35/2*d^2*c^4/ln(F
)/b*x^3*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+21/2*d*c^5/ln(F)/b*x^2*F^
(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-35/4*d^3*c/ln(F)^2/b^2*x^4*F^(b*d^2
*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+105/8*d*c/ln(F)^3/b^3*x^2*F^(b*d^2*x^2)*F
^(2*b*c*d*x)*F^(b*c^2)*F^a+7/2*d^5*c/ln(F)/b*x^6*F^(b*d^2*x^2)*F^(2*b*c*d*x
)*F^(b*c^2)*F^a+21/2*d^4*c^2/ln(F)/b*x^5*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c
^2)*F^a+105/8*c^2/ln(F)^3/b^3*x*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+7
/2*c^6/ln(F)/b*x*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-35/4*c^4/ln(F)^2
/b^2*x*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+1/2*d^6/ln(F)/b*x^7*F^(b*d
^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-7/4*d^4/ln(F)^2/b^2*x^5*F^(b*d^2*x^2)*F
^(2*b*c*d*x)*F^(b*c^2)*F^a+35/8*d^2/ln(F)^3/b^3*x^3*F^(b*d^2*x^2)*F^(2*b*c*
d*x)*F^(b*c^2)*F^a-105/16/d*c/ln(F)^4/b^4*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*
```

```
c^2)*F^a+1/2/d*c^7/ln(F)/b*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-7/4/d*
c^5/ln(F)^2/b^2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+35/8/d*c^3/ln(F)^
3/b^3*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-105/16/ln(F)^4/b^4*x*F^(b*d
^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-105/32/d/ln(F)^4/b^4*Pi^(1/2)*F^a/(-b*l
n(F))^(1/2)*erf(1/(-b*ln(F))^(1/2)*b*c*ln(F)-(-b*ln(F))^(1/2)*d*x)
```

maxima [B] time = 12.51, size = 3066, normalized size = 17.13

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^8,x, algorithm="maxima")
```

```
[Out] -4*(sqrt(pi)*(b*d^2*x + b*c*d)*b*c*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b
*d^2))) - 1)*log(F)^2/((b*log(F))^(3/2)*d^2*sqrt(-(b*d^2*x + b*c*d)^2*log(F
)/(b*d^2))) - F^((b*d^2*x + b*c*d)^2/(b*d^2))*b*log(F)/((b*log(F))^(3/2)*d)
)*F^a*c^7/sqrt(b*log(F)) + 14*(sqrt(pi)*(b*d^2*x + b*c*d)*b^2*c^2*(erf(sqrt
(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^3/((b*log(F))^(5/2)*d^3*
sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 2*F^((b*d^2*x + b*c*d)^2/(b*d^
2))*b^2*c*log(F)^2/((b*log(F))^(5/2)*d^2) - (b*d^2*x + b*c*d)^3*gamma(3/2,
-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F))^(5/2)*d^5*(-(b*d^
2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)))*F^a*c^6*d/sqrt(b*log(F)) - 28*(sqrt(
pi)*(b*d^2*x + b*c*d)*b^3*c^3*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2)
)) - 1)*log(F)^4/((b*log(F))^(7/2)*d^4*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*
d^2))) - 3*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^3*c^2*log(F)^3/((b*log(F))^(7/
2)*d^3) - 3*(b*d^2*x + b*c*d)^3*b*c*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/
(b*d^2))*log(F)^4/((b*log(F))^(7/2)*d^6*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2
))^(3/2)) + b^2*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^2/((b*
log(F))^(7/2)*d^3))*F^a*c^5*d^2/sqrt(b*log(F)) + 35*(sqrt(pi)*(b*d^2*x + b*
c*d)*b^4*c^4*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^5/
((b*log(F))^(9/2)*d^5*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 4*F^((b*
d^2*x + b*c*d)^2/(b*d^2))*b^4*c^3*log(F)^4/((b*log(F))^(9/2)*d^4) - 6*(b*d^
2*x + b*c*d)^3*b^2*c^2*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(
F)^5/((b*log(F))^(9/2)*d^7*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) + 4
*b^3*c*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F))^(
9/2)*d^4) - (b*d^2*x + b*c*d)^5*gamma(5/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d
^2))*log(F)^5/((b*log(F))^(9/2)*d^9*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(
5/2)))*F^a*c^4*d^3/sqrt(b*log(F)) - 28*(sqrt(pi)*(b*d^2*x + b*c*d)*b^5*c^5*
(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^6/((b*log(F))^(
11/2)*d^6*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 5*F^((b*d^2*x + b*c*
d)^2/(b*d^2))*b^5*c^4*log(F)^5/((b*log(F))^(11/2)*d^5) - 10*(b*d^2*x + b*c*
d)^3*b^3*c^3*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^6/((b*l
og(F))^(11/2)*d^8*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) + 10*b^4*c^2
*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^4/((b*log(F))^(11/2)*
d^5) - b^3*gamma(3, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F
```

```
))^(11/2)*d^5) - 5*(b*d^2*x + b*c*d)^5*b*c*gamma(5/2, -(b*d^2*x + b*c*d)^2*
log(F)/(b*d^2))*log(F)^6/((b*log(F))^(11/2)*d^10*(-(b*d^2*x + b*c*d)^2*log(
F)/(b*d^2))^(5/2)))*F^a*c^3*d^4/sqrt(b*log(F)) + 14*(sqrt(pi)*(b*d^2*x + b*
c*d)*b^6*c^6*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^7/
((b*log(F))^(13/2)*d^7*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 6*F^((b
*d^2*x + b*c*d)^2/(b*d^2))*b^6*c^5*log(F)^6/((b*log(F))^(13/2)*d^6) - 15*(b
*d^2*x + b*c*d)^3*b^4*c^4*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*l
og(F)^7/((b*log(F))^(13/2)*d^9*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2))
 + 20*b^5*c^3*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^5/((b*lo
g(F))^(13/2)*d^6) - 6*b^4*c*gamma(3, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*l
og(F)^4/((b*log(F))^(13/2)*d^6) - 15*(b*d^2*x + b*c*d)^5*b^2*c^2*gamma(5/2,
 -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^7/((b*log(F))^(13/2)*d^11*(-(b
*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(5/2)) - (b*d^2*x + b*c*d)^7*gamma(7/2, -
(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^7/((b*log(F))^(13/2)*d^13*(-(b*d
^2*x + b*c*d)^2*log(F)/(b*d^2))^(7/2)))*F^a*c^2*d^5/sqrt(b*log(F)) - 4*(sqr
t(pi)*(b*d^2*x + b*c*d)*b^7*c^7*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^
2))) - 1)*log(F)^8/((b*log(F))^(15/2)*d^8*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/
(b*d^2))) - 7*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^7*c^6*log(F)^7/((b*log(F))^
(15/2)*d^7) - 21*(b*d^2*x + b*c*d)^3*b^5*c^5*gamma(3/2, -(b*d^2*x + b*c*d)^
2*log(F)/(b*d^2))*log(F)^8/((b*log(F))^(15/2)*d^10*(-(b*d^2*x + b*c*d)^2*lo
g(F)/(b*d^2))^(3/2)) + 35*b^6*c^4*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d
^2))*log(F)^6/((b*log(F))^(15/2)*d^7) - 21*b^5*c^2*gamma(3, -(b*d^2*x + b*c
*d)^2*log(F)/(b*d^2))*log(F)^5/((b*log(F))^(15/2)*d^7) - 35*(b*d^2*x + b*c*
d)^5*b^3*c^3*gamma(5/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^8/((b*l
og(F))^(15/2)*d^12*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(5/2)) + b^4*gamma
(4, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^4/((b*log(F))^(15/2)*d^7) -
 7*(b*d^2*x + b*c*d)^7*b*c*gamma(7/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*
log(F)^8/((b*log(F))^(15/2)*d^14*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(7/2
)))*F^a*c*d^6/sqrt(b*log(F)) + 1/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b^8*c^8*(erf
(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^9/((b*log(F))^(17/2
)*d^9*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 8*F^((b*d^2*x + b*c*d)^2
/(b*d^2))*b^8*c^7*log(F)^8/((b*log(F))^(17/2)*d^8) - 28*(b*d^2*x + b*c*d)^3
*b^6*c^6*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^9/((b*log(F
))^(17/2)*d^11*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) + 56*b^7*c^5*ga
mma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^7/((b*log(F))^(17/2)*d^8
) - 56*b^6*c^3*gamma(3, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^6/((b*l
og(F))^(17/2)*d^8) - 70*(b*d^2*x + b*c*d)^5*b^4*c^4*gamma(5/2, -(b*d^2*x +
b*c*d)^2*log(F)/(b*d^2))*log(F)^9/((b*log(F))^(17/2)*d^13*(-(b*d^2*x + b*c*
d)^2*log(F)/(b*d^2))^(5/2)) + 8*b^5*c*gamma(4, -(b*d^2*x + b*c*d)^2*log(F)/
(b*d^2))*log(F)^5/((b*log(F))^(17/2)*d^8) - 28*(b*d^2*x + b*c*d)^7*b^2*c^2*
gamma(7/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^9/((b*log(F))^(17/2)
*d^15*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(7/2)) - (b*d^2*x + b*c*d)^9*ga
mma(9/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^9/((b*log(F))^(17/2)*d
^17*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(9/2)))*F^a*d^7/sqrt(b*log(F)) +
1/2*sqrt(pi)*F^(b*c^2 + a)*c^8*erf(sqrt(-b*log(F))*d*x - b*c*log(F)/sqrt(-b
```

```
*log(F)))/(sqrt(-b*log(F))*F^(b*c^2)*d)
```

mupad [B] time = 3.91, size = 533, normalized size = 2.98

$$\frac{105\,F^a\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\,x\,\ln(F)\,d^2+b\,c\,\ln(F)\,d}{\sqrt{b\,d^2\,\ln(F)}}\right)}{32\,b^4\,\ln(F)^4\,\sqrt{b\,d^2\,\ln(F)}}+\frac{7\,F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,x\,\left(8\,b^3\,c^6\,\ln(F)^3-20\,b^2\,c^4\,\ln(F)^2+30\,b\,c^2\,\ln(F)-\right.}{16\,b^4\,\ln(F)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)*(c + d*x)^8,x)
```

```
[Out] (105*F^a*pi^(1/2)*erfi((b*c*d*log(F) + b*d^2*x*log(F))/(b*d^2*log(F))^(1/2)
))/(32*b^4*log(F)^4*(b*d^2*log(F))^(1/2)) + (7*F^(b*d^2*x^2)*F^a*F^(b*c^2)*
F^(2*b*c*d*x)*x*(30*b*c^2*log(F) - 20*b^2*c^4*log(F)^2 + 8*b^3*c^6*log(F)^3
 - 15))/(16*b^4*log(F)^4) - (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*((10
5*c)/16 - (35*b*c^3*log(F))/8 + (7*b^2*c^5*log(F)^2)/4 - (b^3*c^7*log(F)^3)
/2))/(b^4*d*log(F)^4) + (7*F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*x^2*(1
5*c*d + 12*b^2*c^5*d*log(F)^2 - 20*b*c^3*d*log(F)))/(8*b^3*log(F)^3) + (F^(
b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*d^6*x^7)/(2*b*log(F)) + (35*F^(b*d^2
*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*x^3*(d^2 + 4*b^2*c^4*d^2*log(F)^2 - 4*b*c
^2*d^2*log(F)))/(8*b^3*log(F)^3) - (35*F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c
*d*x)*x^4*(c*d^3 - 2*b*c^3*d^3*log(F)))/(4*b^2*log(F)^2) + (7*F^(b*d^2*x^2)
*F^a*F^(b*c^2)*F^(2*b*c*d*x)*c*d^5*x^6)/(2*b*log(F)) + (7*F^(b*d^2*x^2)*F^a
*F^(b*c^2)*F^(2*b*c*d*x)*d^4*x^5*(6*b*c^2*log(F) - 1))/(4*b^2*log(F)^2)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+b(c+dx)^2}\,(c+dx)^8\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)*(d*x+c)**8,x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**2)*(c + d*x)**8, x)
```

3.270 $\int F^{a+b(c+dx)^2}(c+dx)^6\,dx$

Optimal. Leaf size=145

$$-\frac{15\sqrt{\pi}\,F^a\text{erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{16b^{7/2}d\log^{\frac{7}{2}}(F)}+\frac{15(c+dx)F^{a+b(c+dx)^2}}{8b^3d\log^3(F)}-\frac{5(c+dx)^3F^{a+b(c+dx)^2}}{4b^2d\log^2(F)}+\frac{(c+dx)^5F^{a+b(c+dx)^2}}{2bd\log(F)}$$

```
[Out] 15/8*F^(a+b*(d*x+c)^2)*(d*x+c)/b^3/d/ln(F)^3-5/4*F^(a+b*(d*x+c)^2)*(d*x+c)^
3/b^2/d/ln(F)^2+1/2*F^(a+b*(d*x+c)^2)*(d*x+c)^5/b/d/ln(F)-15/16*F^a*erfi((d
*x+c)*b^(1/2)*ln(F)^(1/2))*Pi^(1/2)/b^(7/2)/d/ln(F)^(7/2)
```

Rubi [A] time = 0.23, antiderivative size = 145, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2212, 2204}

$$-\frac{15\sqrt{\pi}\,F^a\text{Erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{16b^{7/2}d\log^{\frac{7}{2}}(F)}-\frac{5(c+dx)^3F^{a+b(c+dx)^2}}{4b^2d\log^2(F)}+\frac{15(c+dx)F^{a+b(c+dx)^2}}{8b^3d\log^3(F)}+\frac{(c+dx)^5F^{a+b(c+dx)^2}}{2bd\log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)*(c + d*x)^6,x]
```

```
[Out] (-15*F^a*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]])/(16*b^(7/2)*d*Log[F
]^(7/2)) + (15*F^(a + b*(c + d*x)^2)*(c + d*x))/(8*b^3*d*Log[F]^3) - (5*F^(
a + b*(c + d*x)^2)*(c + d*x)^3)/(4*b^2*d*Log[F]^2) + (F^(a + b*(c + d*x)^2)
*(c + d*x)^5)/(2*b*d*Log[F])
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int F^{a+b(c+dx)^2}(c+dx)^6\,dx = \frac{F^{a+b(c+dx)^2}(c+dx)^5}{2bd\log(F)} - \frac{5\int F^{a+b(c+dx)^2}(c+dx)^4\,dx}{2b\log(F)}$$
$$= -\frac{5F^{a+b(c+dx)^2}(c+dx)^3}{4b^2d\log^2(F)} + \frac{F^{a+b(c+dx)^2}(c+dx)^5}{2bd\log(F)} + \frac{15\int F^{a+b(c+dx)^2}(c+dx)^2\,dx}{4b^2\log^2(F)}$$
$$= \frac{15F^{a+b(c+dx)^2}(c+dx)}{8b^3d\log^3(F)} - \frac{5F^{a+b(c+dx)^2}(c+dx)^3}{4b^2d\log^2(F)} + \frac{F^{a+b(c+dx)^2}(c+dx)^5}{2bd\log(F)} - \frac{15\int F^{a+b(c+dx}}{8b^3\log^3(}$$
$$= -\frac{15F^a\sqrt{\pi}\,\text{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)}{16b^{7/2}d\log^{\frac{7}{2}}(F)} + \frac{15F^{a+b(c+dx)^2}(c+dx)}{8b^3d\log^3(F)} - \frac{5F^{a+b(c+dx)^2}(c+dx)}{4b^2d\log^2(F)}$$

Mathematica [A] time = 0.15, size = 126, normalized size = 0.87

$$\frac{F^a\left(-\frac{15\sqrt{\pi}\,\text{erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{b^{5/2}\log^{\frac{5}{2}}(F)} + \frac{30(c+dx)F^{b(c+dx)^2}}{b^2\log^2(F)} + 8(c+dx)^5F^{b(c+dx)^2} - \frac{20(c+dx)^3F^{b(c+dx)^2}}{b\log(F)}\right)}{16bd\log(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)*(c + d*x)^6,x]
```

```
[Out] (F^a*(8*F^(b*(c + d*x)^2)*(c + d*x)^5 - (15*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)
*Sqrt[Log[F]]])/(b^(5/2)*Log[F]^(5/2)) + (30*F^(b*(c + d*x)^2)*(c + d*x))/(
b^2*Log[F]^2) - (20*F^(b*(c + d*x)^2)*(c + d*x)^3)/(b*Log[F])))/(16*b*d*Log
[F])
```

fricas [A] time = 0.65, size = 218, normalized size = 1.50

$$\frac{15\sqrt{\pi}\sqrt{-bd^2\log(F)}\,F^a\,\text{erf}\left(\frac{\sqrt{-bd^2\log(F)}\,(dx+c)}{d}\right) + 2\left(4\left(b^3d^6x^5 + 5\,b^3cd^5x^4 + 10\,b^3c^2d^4x^3 + 10\,b^3c^3d^3x^2 + 5\,b^3c^4d^2\right.\right.}{16\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^6,x, algorithm="fricas")
```

```
[Out] 1/16*(15*sqrt(pi)*sqrt(-b*d^2*log(F))*F^a*erf(sqrt(-b*d^2*log(F))*(d*x + c)
/d) + 2*(4*(b^3*d^6*x^5 + 5*b^3*c*d^5*x^4 + 10*b^3*c^2*d^4*x^3 + 10*b^3*c^3
*d^3*x^2 + 5*b^3*c^4*d^2*x + b^3*c^5*d)*log(F)^3 - 10*(b^2*d^4*x^3 + 3*b^2*
c*d^3*x^2 + 3*b^2*c^2*d^2*x + b^2*c^3*d)*log(F)^2 + 15*(b*d^2*x + b*c*d)*lo
g(F))*F^(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a))/(b^4*d^2*log(F)^4)
```

giac [A] time = 0.31, size = 132, normalized size = 0.91

$$\frac{\left(4\,b^2d^4\left(x+\frac{c}{d}\right)^5\log(F)^2-10\,bd^2\left(x+\frac{c}{d}\right)^3\log(F)+15\,x+\frac{15\,c}{d}\right)e^{\left(bd^2x^2\log(F)+2\,bcdx\log(F)+bc^2\log(F)+a\log(F)\right)}}{8\,b^3\log(F)^3}+\frac{15\,\sqrt{\pi}\,F^a\,\mathrm{e}}{16\,\sqrt{}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^6,x, algorithm="giac")
```

```
[Out] 1/8*(4*b^2*d^4*(x + c/d)^5*log(F)^2 - 10*b*d^2*(x + c/d)^3*log(F) + 15*x +
15*c/d)*e^(b*d^2*x^2*log(F) + 2*b*c*d*x*log(F) + b*c^2*log(F) + a*log(F))/(
b^3*log(F)^3) + 15/16*sqrt(pi)*F^a*erf(-sqrt(-b*log(F))*d*(x + c/d))/(sqrt(
-b*log(F))*b^3*d*log(F)^3)
```

maple [B] time = 0.11, size = 561, normalized size = 3.87

$$\frac{d^4x^5F^aF^{b\,c^2}F^{b\,d^2x^2}F^{2bcdx}}{2b\ln(F)}+\frac{5c\,d^3x^4F^aF^{b\,c^2}F^{b\,d^2x^2}F^{2bcdx}}{2b\ln(F)}+\frac{5c^2d^2x^3F^aF^{b\,c^2}F^{b\,d^2x^2}F^{2bcdx}}{b\ln(F)}+\frac{5c^3d\,x^2F^aF^{b\,c^2}F^{b\,d^2x^2}F^{2bcdx}}{b\ln(F)}+\frac{5c^4}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+(d*x+c)^2*b)*(d*x+c)^6,x)
```

```
[Out] 5/2*d^3*c/ln(F)/b*x^4*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+5*d^2*c^2/l
n(F)/b*x^3*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+5*d*c^3/ln(F)/b*x^2*F^
(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-15/4*d*c/ln(F)^2/b^2*x^2*F^(b*d^2*x
^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+1/2*d^4/ln(F)/b*x^5*F^(b*d^2*x^2)*F^(2*b*c*
d*x)*F^(b*c^2)*F^a+5/2*c^4/ln(F)/b*x*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*
F^a+1/2/d*c^5/ln(F)/b*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-5/4/d*c^3/l
n(F)^2/b^2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-15/4*c^2/ln(F)^2/b^2*x
*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+15/8/d*c/ln(F)^3/b^3*F^(b*d^2*x^
2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-5/4*d^2/ln(F)^2/b^2*x^3*F^(b*d^2*x^2)*F^(2*b
*c*d*x)*F^(b*c^2)*F^a+15/8/ln(F)^3/b^3*x*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c
^2)*F^a+15/16/d/ln(F)^3/b^3*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*erf(1/(-b*ln(F))^
(1/2)*b*c*ln(F)-(-b*ln(F))^(1/2)*d*x)
```

maxima [B] time = 8.45, size = 1922, normalized size = 13.26

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^6,x, algorithm="maxima")
```

```
[Out] -3*(sqrt(pi)*(b*d^2*x + b*c*d)*b*c*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b
*d^2))) - 1)*log(F)^2/((b*log(F))^(3/2)*d^2*sqrt(-(b*d^2*x + b*c*d)^2*log(F
```

)/(b*d^2))) - F^((b*d^2*x + b*c*d)^2/(b*d^2))*b*log(F)/((b*log(F))^(3/2)*d)
)*F^a*c^5/sqrt(b*log(F)) + 15/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b^2*c^2*(erf(sq
rt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^3/((b*log(F))^(5/2)*d^
3*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 2*F^((b*d^2*x + b*c*d)^2/(b*
d^2))*b^2*c*log(F)^2/((b*log(F))^(5/2)*d^2) - (b*d^2*x + b*c*d)^3*gamma(3/2
, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F))^(5/2)*d^5*(-(b*
d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)))*F^a*c^4*d/sqrt(b*log(F)) - 10*(sqr
t(pi)*(b*d^2*x + b*c*d)*b^3*c^3*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^
2))) - 1)*log(F)^4/((b*log(F))^(7/2)*d^4*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(
b*d^2))) - 3*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^3*c^2*log(F)^3/((b*log(F))^(
7/2)*d^3) - 3*(b*d^2*x + b*c*d)^3*b*c*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F
)/(b*d^2))*log(F)^4/((b*log(F))^(7/2)*d^6*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d
^2))^(3/2)) + b^2*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^2/((
b*log(F))^(7/2)*d^3))*F^a*c^3*d^2/sqrt(b*log(F)) + 15/2*(sqrt(pi)*(b*d^2*x
+ b*c*d)*b^4*c^4*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F
)^5/((b*log(F))^(9/2)*d^5*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 4*F^
((b*d^2*x + b*c*d)^2/(b*d^2))*b^4*c^3*log(F)^4/((b*log(F))^(9/2)*d^4) - 6*(
b*d^2*x + b*c*d)^3*b^2*c^2*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*
log(F)^5/((b*log(F))^(9/2)*d^7*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2))
 + 4*b^3*c*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F
))^(9/2)*d^4) - (b*d^2*x + b*c*d)^5*gamma(5/2, -(b*d^2*x + b*c*d)^2*log(F)/
(b*d^2))*log(F)^5/((b*log(F))^(9/2)*d^9*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2
))^(5/2)))*F^a*c^2*d^3/sqrt(b*log(F)) - 3*(sqrt(pi)*(b*d^2*x + b*c*d)*b^5*c
^5*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^6/((b*log(F)
)^(11/2)*d^6*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 5*F^((b*d^2*x + b
*c*d)^2/(b*d^2))*b^5*c^4*log(F)^5/((b*log(F))^(11/2)*d^5) - 10*(b*d^2*x + b
*c*d)^3*b^3*c^3*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^6/((
b*log(F))^(11/2)*d^8*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) + 10*b^4*
c^2*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^4/((b*log(F))^(11/
2)*d^5) - b^3*gamma(3, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*lo
g(F))^(11/2)*d^5) - 5*(b*d^2*x + b*c*d)^5*b*c*gamma(5/2, -(b*d^2*x + b*c*d)
^2*log(F)/(b*d^2))*log(F)^6/((b*log(F))^(11/2)*d^10*(-(b*d^2*x + b*c*d)^2*l
og(F)/(b*d^2))^(5/2)))*F^a*c*d^4/sqrt(b*log(F)) + 1/2*(sqrt(pi)*(b*d^2*x +
b*c*d)*b^6*c^6*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^
7/((b*log(F))^(13/2)*d^7*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 6*F^(
(b*d^2*x + b*c*d)^2/(b*d^2))*b^6*c^5*log(F)^6/((b*log(F))^(13/2)*d^6) - 15*
(b*d^2*x + b*c*d)^3*b^4*c^4*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))
*log(F)^7/((b*log(F))^(13/2)*d^9*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2
)) + 20*b^5*c^3*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^5/((b*
log(F))^(13/2)*d^6) - 6*b^4*c*gamma(3, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))
*log(F)^4/((b*log(F))^(13/2)*d^6) - 15*(b*d^2*x + b*c*d)^5*b^2*c^2*gamma(5/
2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^7/((b*log(F))^(13/2)*d^11*(-
(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(5/2)) - (b*d^2*x + b*c*d)^7*gamma(7/2,
 -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^7/((b*log(F))^(13/2)*d^13*(-(b
*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(7/2)))*F^a*d^5/sqrt(b*log(F)) + 1/2*sqrt

```
(pi)*F^(b*c^2 + a)*c^6*erf(sqrt(-b*log(F))*d*x - b*c*log(F)/sqrt(-b*log(F))
)/(sqrt(-b*log(F))*F^(b*c^2)*d)
```

mupad [B] time = 3.77, size = 378, normalized size = 2.61

$$F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,\left(\frac{15\,c}{8\,b^3\,d\,\ln(F)^3}+\frac{c^5}{2\,b\,d\,\ln(F)}-\frac{5\,c^3}{4\,b^2\,d\,\ln(F)^2}\right)-\frac{15\,F^a\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\,x\,\ln(F)\,d^2+b\,c\,\ln(F)\,d}{\sqrt{b\,d^2\,\ln(F)}}\right)}{16\,b^3\,\ln(F)^3\,\sqrt{b\,d^2\,\ln(F)}}-\frac{5\,F^{b\,d^2\,x^2}\,F}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)*(c + d*x)^6,x)
```

```
[Out] F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*((15*c)/(8*b^3*d*log(F)^3) + c^5/
(2*b*d*log(F)) - (5*c^3)/(4*b^2*d*log(F)^2)) - (15*F^a*pi^(1/2)*erfi((b*c*d
*log(F) + b*d^2*x*log(F))/(b*d^2*log(F))^(1/2)))/(16*b^3*log(F)^3*(b*d^2*lo
g(F))^(1/2)) - (5*F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*x^2*(3*c*d - 4*
b*c^3*d*log(F)))/(4*b^2*log(F)^2) + (5*F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c
*d*x)*x*(4*b^2*c^4*log(F)^2 - 6*b*c^2*log(F) + 3))/(8*b^3*log(F)^3) + (F^(b
*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*d^4*x^5)/(2*b*log(F)) + (5*F^(b*d^2*x
^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*c*d^3*x^4)/(2*b*log(F)) + (5*F^(b*d^2*x^2)*
F^a*F^(b*c^2)*F^(2*b*c*d*x)*d^2*x^3*(4*b*c^2*log(F) - 1))/(4*b^2*log(F)^2)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+b(c+dx)^2}\,(c+dx)^6\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)*(d*x+c)**6,x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**2)*(c + d*x)**6, x)
```

3.271 $\int F^{a+b(c+dx)^2}(c+dx)^4\,dx$

Optimal. Leaf size=111

$$\frac{3\sqrt{\pi}\,F^a\text{erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{8b^{5/2}d\log^{\frac{5}{2}}(F)}-\frac{3(c+dx)F^{a+b(c+dx)^2}}{4b^2d\log^2(F)}+\frac{(c+dx)^3F^{a+b(c+dx)^2}}{2bd\log(F)}$$

```
[Out] -3/4*F^(a+b*(d*x+c)^2)*(d*x+c)/b^2/d/ln(F)^2+1/2*F^(a+b*(d*x+c)^2)*(d*x+c)^
3/b/d/ln(F)+3/8*F^a*erfi((d*x+c)*b^(1/2)*ln(F)^(1/2))*Pi^(1/2)/b^(5/2)/d/ln
(F)^(5/2)
```

Rubi [A] time = 0.15, antiderivative size = 111, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2212, 2204}

$$\frac{3\sqrt{\pi}\,F^a\text{Erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{8b^{5/2}d\log^{\frac{5}{2}}(F)}-\frac{3(c+dx)F^{a+b(c+dx)^2}}{4b^2d\log^2(F)}+\frac{(c+dx)^3F^{a+b(c+dx)^2}}{2bd\log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)*(c + d*x)^4,x]
```

```
[Out] (3*F^a*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]])/(8*b^(5/2)*d*Log[F]^(
5/2)) - (3*F^(a + b*(c + d*x)^2)*(c + d*x))/(4*b^2*d*Log[F]^2) + (F^(a + b*
(c + d*x)^2)*(c + d*x)^3)/(2*b*d*Log[F])
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int F^{a+b(c+dx)^2}(c+dx)^4\,dx = \frac{F^{a+b(c+dx)^2}(c+dx)^3}{2bd\log(F)} - \frac{3\int F^{a+b(c+dx)^2}(c+dx)^2\,dx}{2b\log(F)}$$
$$= -\frac{3F^{a+b(c+dx)^2}(c+dx)}{4b^2d\log^2(F)} + \frac{F^{a+b(c+dx)^2}(c+dx)^3}{2bd\log(F)} + \frac{3\int F^{a+b(c+dx)^2}\,dx}{4b^2\log^2(F)}$$
$$= \frac{3F^a\sqrt{\pi}\,\text{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)}{8b^{5/2}d\log^{\frac{5}{2}}(F)} - \frac{3F^{a+b(c+dx)^2}(c+dx)}{4b^2d\log^2(F)} + \frac{F^{a+b(c+dx)^2}(c+dx)^3}{2bd\log(F)}$$

Mathematica [A] time = 0.10, size = 90, normalized size = 0.81

$$\frac{F^a\left(3\sqrt{\pi}\,\text{erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)+2\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)F^{b(c+dx)^2}\left(2b\log(F)(c+dx)^2-3\right)\right)}{8b^{5/2}d\log^{\frac{5}{2}}(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)*(c + d*x)^4,x]
```

```
[Out] (F^a*(3*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]] + 2*Sqrt[b]*F^(b*(c +
 d*x)^2)*(c + d*x)*Sqrt[Log[F]]*(-3 + 2*b*(c + d*x)^2*Log[F])))/(8*b^(5/2)*
d*Log[F]^(5/2))
```

fricas [A] time = 0.68, size = 141, normalized size = 1.27

$$-\frac{3\sqrt{\pi}\sqrt{-bd^2\log(F)}\,F^a\,\text{erf}\left(\frac{\sqrt{-bd^2\log(F)}\,(dx+c)}{d}\right)-2\left(2\left(b^2d^4x^3+3\,b^2cd^3x^2+3\,b^2c^2d^2x+b^2c^3d\right)\log(F)^2-3\left(bd^2x\right.\right.}{8\,b^3d^2\log(F)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^4,x, algorithm="fricas")
```

```
[Out] -1/8*(3*sqrt(pi)*sqrt(-b*d^2*log(F))*F^a*erf(sqrt(-b*d^2*log(F))*(d*x + c)/
d) - 2*(2*(b^2*d^4*x^3 + 3*b^2*c*d^3*x^2 + 3*b^2*c^2*d^2*x + b^2*c^3*d)*log
(F)^2 - 3*(b*d^2*x + b*c*d)*log(F))*F^(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a))/
(b^3*d^2*log(F)^3)
```

giac [A] time = 0.29, size = 111, normalized size = 1.00

$$\frac{\left(2\,bd^2\left(x+\frac{c}{d}\right)^3\log(F)-3\,x-\frac{3\,c}{d}\right)e^{\left(bd^2x^2\log(F)+2\,bcdx\log(F)+bc^2\log(F)+a\log(F)\right)}}{4\,b^2\log(F)^2}-\frac{3\sqrt{\pi}\,F^a\,\text{erf}\left(-\sqrt{-b\log(F)}\,d\left(x+\frac{c}{d}\right)\right)}{8\sqrt{-b\log(F)}\,b^2d\log(F)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^4,x, algorithm="giac")
```

```
[Out] 1/4*(2*b*d^2*(x + c/d)^3*log(F) - 3*x - 3*c/d)*e^(b*d^2*x^2*log(F) + 2*b*c*
d*x*log(F) + b*c^2*log(F) + a*log(F))/(b^2*log(F)^2) - 3/8*sqrt(pi)*F^a*erf
(-sqrt(-b*log(F))*d*(x + c/d))/(sqrt(-b*log(F))*b^2*d*log(F)^2)
```

maple [B] time = 0.09, size = 300, normalized size = 2.70

$$\frac{d^2x^3F^aF^{b\,c^2}F^{b\,d^2x^2}F^{2bcdx}}{2b\ln(F)}+\frac{3cd\,x^2F^aF^{b\,c^2}F^{b\,d^2x^2}F^{2bcdx}}{2b\ln(F)}+\frac{3c^2x\,F^aF^{b\,c^2}F^{b\,d^2x^2}F^{2bcdx}}{2b\ln(F)}+\frac{c^3F^aF^{b\,c^2}F^{b\,d^2x^2}F^{2bcdx}}{2bd\ln(F)}-\frac{3x\,F^aF^{b\,c^2}F}{4b^2\ln}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+(d*x+c)^2*b)*(d*x+c)^4,x)
```

```
[Out] 1/2*d^2/ln(F)/b*x^3*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+3/2*d*c/ln(F)
/b*x^2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+3/2*c^2/ln(F)/b*x*F^(b*d^2
*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+1/2/d*c^3/ln(F)/b*F^(b*d^2*x^2)*F^(2*b*c*
d*x)*F^(b*c^2)*F^a-3/4/d*c/ln(F)^2/b^2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2
)*F^a-3/4/ln(F)^2/b^2*x*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-3/8/d/ln(
F)^2/b^2*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*erf(1/(-b*ln(F))^(1/2)*b*c*ln(F)-(-b
*ln(F))^(1/2)*d*x)
```

maxima [B] time = 5.27, size = 1037, normalized size = 9.34

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^4,x, algorithm="maxima")
```

```
[Out] -2*(sqrt(pi)*(b*d^2*x + b*c*d)*b*c*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b
*d^2))) - 1)*log(F)^2/((b*log(F))^(3/2)*d^2*sqrt(-(b*d^2*x + b*c*d)^2*log(F
)/(b*d^2))) - F^((b*d^2*x + b*c*d)^2/(b*d^2))*b*log(F)/((b*log(F))^(3/2)*d)
)*F^a*c^3/sqrt(b*log(F)) + 3*(sqrt(pi)*(b*d^2*x + b*c*d)*b^2*c^2*(erf(sqrt(
-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^3/((b*log(F))^(5/2)*d^3*s
qrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 2*F^((b*d^2*x + b*c*d)^2/(b*d^2
))*b^2*c*log(F)^2/((b*log(F))^(5/2)*d^2) - (b*d^2*x + b*c*d)^3*gamma(3/2, -
(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F))^(5/2)*d^5*(-(b*d^2
*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)))*F^a*c^2*d/sqrt(b*log(F)) - 2*(sqrt(pi
)*(b*d^2*x + b*c*d)*b^3*c^3*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2)))
 - 1)*log(F)^4/((b*log(F))^(7/2)*d^4*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^
2))) - 3*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^3*c^2*log(F)^3/((b*log(F))^(7/2)
*d^3) - 3*(b*d^2*x + b*c*d)^3*b*c*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b
```

```
*d^2))*log(F)^4/((b*log(F))^(7/2)*d^6*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))
^(3/2)) + b^2*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^2/((b*lo
g(F))^(7/2)*d^3))*F^a*c*d^2/sqrt(b*log(F)) + 1/2*(sqrt(pi)*(b*d^2*x + b*c*d
)*b^4*c^4*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^5/((b
*log(F))^(9/2)*d^5*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 4*F^((b*d^2
*x + b*c*d)^2/(b*d^2))*b^4*c^3*log(F)^4/((b*log(F))^(9/2)*d^4) - 6*(b*d^2*x
 + b*c*d)^3*b^2*c^2*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^
5/((b*log(F))^(9/2)*d^7*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) + 4*b^
3*c*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F))^(9/2
)*d^4) - (b*d^2*x + b*c*d)^5*gamma(5/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2)
)*log(F)^5/((b*log(F))^(9/2)*d^9*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(5/2
)))*F^a*d^3/sqrt(b*log(F)) + 1/2*sqrt(pi)*F^(b*c^2 + a)*c^4*erf(sqrt(-b*log
(F))*d*x - b*c*log(F)/sqrt(-b*log(F)))/(sqrt(-b*log(F))*F^(b*c^2)*d)
```

mupad [B] time = 3.60, size = 243, normalized size = 2.19

$$\frac{3\,F^a\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\,x\,\ln(F)\,d^2+b\,c\,\ln(F)\,d}{\sqrt{b\,d^2\,\ln(F)}}\right)}{8\,b^2\,\ln(F)^2\,\sqrt{b\,d^2\,\ln(F)}}-F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,\left(\frac{3\,c}{4\,b^2\,d\,\ln(F)^2}-\frac{c^3}{2\,b\,d\,\ln(F)}\right)+\frac{3\,F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,x}{4\,b^2\,\ln(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)*(c + d*x)^4,x)
```

```
[Out] (3*F^a*pi^(1/2)*erfi((b*c*d*log(F) + b*d^2*x*log(F))/(b*d^2*log(F))^(1/2)))
/(8*b^2*log(F)^2*(b*d^2*log(F))^(1/2)) - F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b
*c*d*x)*((3*c)/(4*b^2*d*log(F)^2) - c^3/(2*b*d*log(F))) + (3*F^(b*d^2*x^2)*
F^a*F^(b*c^2)*F^(2*b*c*d*x)*x*(2*b*c^2*log(F) - 1))/(4*b^2*log(F)^2) + (F^(
b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*d^2*x^3)/(2*b*log(F)) + (3*F^(b*d^2*
x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*c*d*x^2)/(2*b*log(F))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+b(c+dx)^2}\,(c+dx)^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)*(d*x+c)**4,x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**2)*(c + d*x)**4, x)
```

3.272 $\int F^{a+b(c+dx)^2}(c+dx)^2\,dx$

Optimal. Leaf size=77

$$\frac{(c+dx)F^{a+b(c+dx)^2}}{2bd\log(F)}-\frac{\sqrt{\pi}\,F^a\mathrm{erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{4b^{3/2}d\log^{\frac{3}{2}}(F)}$$

```
[Out] 1/2*F^(a+b*(d*x+c)^2)*(d*x+c)/b/d/ln(F)-1/4*F^a*erfi((d*x+c)*b^(1/2)*ln(F)^
(1/2))*Pi^(1/2)/b^(3/2)/d/ln(F)^(3/2)
```

Rubi [A] time = 0.08, antiderivative size = 77, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2212, 2204}

$$\frac{(c+dx)F^{a+b(c+dx)^2}}{2bd\log(F)}-\frac{\sqrt{\pi}\,F^a\mathrm{Erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{4b^{3/2}d\log^{\frac{3}{2}}(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)*(c + d*x)^2,x]
```

```
[Out] -(F^a*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]])/(4*b^(3/2)*d*Log[F]^(3
/2)) + (F^(a + b*(c + d*x)^2)*(c + d*x))/(2*b*d*Log[F])
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int F^{a+b(c+dx)^2}(c+dx)^2\,dx = \frac{F^{a+b(c+dx)^2}(c+dx)}{2bd\log(F)} - \frac{\int F^{a+b(c+dx)^2}\,dx}{2b\log(F)}$$
$$= -\frac{F^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)}{4b^{3/2}d\log^{\frac{3}{2}}(F)} + \frac{F^{a+b(c+dx)^2}(c+dx)}{2bd\log(F)}$$

Mathematica [A] time = 0.05, size = 77, normalized size = 1.00

$$\frac{(c+dx)F^{a+b(c+dx)^2}}{2bd\log(F)} - \frac{\sqrt{\pi}\,F^a\mathrm{erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{4b^{3/2}d\log^{\frac{3}{2}}(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)*(c + d*x)^2,x]
```

```
[Out] -1/4*(F^a*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]])/(b^(3/2)*d*Log[F]^
(3/2)) + (F^(a + b*(c + d*x)^2)*(c + d*x))/(2*b*d*Log[F])
```

fricas [A] time = 0.66, size = 88, normalized size = 1.14

$$\frac{\sqrt{\pi}\,\sqrt{-bd^2\log(F)}\,F^a\,\mathrm{erf}\left(\frac{\sqrt{-bd^2\log(F)}\,(dx+c)}{d}\right) + 2\left(bd^2x + bcd\right)F^{bd^2x^2+2\,bcdx+bc^2+a}\log(F)}{4\,b^2d^2\log(F)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^2,x, algorithm="fricas")
```

```
[Out] 1/4*(sqrt(pi)*sqrt(-b*d^2*log(F))*F^a*erf(sqrt(-b*d^2*log(F))*(d*x + c)/d)
+ 2*(b*d^2*x + b*c*d)*F^(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a)*log(F))/(b^2*d^
2*log(F)^2)
```

giac [A] time = 0.27, size = 91, normalized size = 1.18

$$\frac{\left(x+\frac{c}{d}\right)e^{\left(bd^2x^2\log(F)+2\,bcdx\log(F)+bc^2\log(F)+a\log(F)\right)}}{2\,b\log(F)} + \frac{\sqrt{\pi}\,F^a\,\mathrm{erf}\left(-\sqrt{-b\log(F)}\,d\left(x+\frac{c}{d}\right)\right)}{4\,\sqrt{-b\log(F)}\,bd\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^2,x, algorithm="giac")
```

```
[Out] 1/2*(x + c/d)*e^(b*d^2*x^2*log(F) + 2*b*c*d*x*log(F) + b*c^2*log(F) + a*log
(F))/(b*log(F)) + 1/4*sqrt(pi)*F^a*erf(-sqrt(-b*log(F))*d*(x + c/d))/(sqrt(
-b*log(F))*b*d*log(F))
```

maple [B] time = 0.07, size = 131, normalized size = 1.70

$$\frac{x F^a F^{b c^2} F^{b d^2 x^2} F^{2bcdx}}{2b\ln(F)}+\frac{c F^a F^{b c^2} F^{b d^2 x^2} F^{2bcdx}}{2bd\ln(F)}+\frac{\sqrt{\pi}\, F^a \operatorname{erf}\left(\frac{bc\ln(F)}{\sqrt{-b\ln(F)}}-\sqrt{-b\ln(F)}\, dx\right)}{4\sqrt{-b\ln(F)}\, bd\ln(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+(d*x+c)^2*b)*(d*x+c)^2,x)
```

```
[Out] 1/2/ln(F)/b*x*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+1/2/d*c/ln(F)/b*F^(
b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+1/4/d/ln(F)/b*Pi^(1/2)*F^a/(-b*ln(F)
)^(1/2)*erf(1/(-b*ln(F))^(1/2)*b*c*ln(F)-(-b*ln(F))^(1/2)*d*x)
```

maxima [B] time = 3.67, size = 413, normalized size = 5.36

$$-\frac{\left(\frac{\sqrt{\pi}\left(bd^2x+bcd\right)bc\left(\operatorname{erf}\left(\sqrt{-\frac{\left(bd^2x+bcd\right)^2\log(F)}{bd^2}}\right)-1\right)\log(F)^2}{\left(b\log(F)\right)^{\frac{3}{2}}d^2\sqrt{-\frac{\left(bd^2x+bcd\right)^2\log(F)}{bd^2}}}-\frac{F^{\frac{\left(bd^2x+bcd\right)^2}{bd^2}}b\log(F)}{\left(b\log(F)\right)^{\frac{3}{2}}d}\right)F^a c}{\sqrt{b\log(F)}}+\frac{\left(\frac{\sqrt{\pi}\left(bd^2x+bcd\right)b^2c^2\left(\operatorname{erf}\left(\sqrt{-\frac{\left(bd^2x+bcd\right)^2\log(F)}{bd^2}}\right)-1\right)1\cdots}{\left(b\log(F)\right)^{\frac{5}{2}}d^3\sqrt{-\frac{\left(bd^2x+bcd\right)^2\log(F)}{bd^2}}}\cdots\right.}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(d*x+c)^2,x, algorithm="maxima")
```

```
[Out] -(sqrt(pi)*(b*d^2*x + b*c*d)*b*c*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d
^2))) - 1)*log(F)^2/((b*log(F))^(3/2)*d^2*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/
(b*d^2))) - F^((b*d^2*x + b*c*d)^2/(b*d^2))*b*log(F)/((b*log(F))^(3/2)*d))*
F^a*c/sqrt(b*log(F)) + 1/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b^2*c^2*(erf(sqrt(-(
b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^3/((b*log(F))^(5/2)*d^3*sqr
t(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 2*F^((b*d^2*x + b*c*d)^2/(b*d^2))
*b^2*c*log(F)^2/((b*log(F))^(5/2)*d^2) - (b*d^2*x + b*c*d)^3*gamma(3/2, -(b
*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F))^(5/2)*d^5*(-(b*d^2*x
 + b*c*d)^2*log(F)/(b*d^2))^(3/2)))*F^a*d/sqrt(b*log(F)) + 1/2*sqrt(pi)*F^(
b*c^2 + a)*c^2*erf(sqrt(-b*log(F))*d*x - b*c*log(F)/sqrt(-b*log(F)))/(sqrt(
-b*log(F))*F^(b*c^2)*d)
```

mupad [B] time = 3.59, size = 130, normalized size = 1.69

$$\frac{F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,x}{2\,b\,\ln(F)}-\frac{F^a\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\,x\,\ln(F)\,d^2+b\,c\,\ln(F)\,d}{\sqrt{b\,d^2\,\ln(F)}}\right)}{4\,b\,\ln(F)\,\sqrt{b\,d^2\,\ln(F)}}+\frac{F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,c}{2\,b\,d\,\ln(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(F^(a + b*(c + d*x)^2)*(c + d*x)^2,x)

[Out] (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*x)/(2*b*log(F)) - (F^a*pi^(1/2)*erfi((b*c*d*log(F) + b*d^2*x*log(F))/(b*d^2*log(F))^(1/2)))/(4*b*log(F)*(b*d^2*log(F))^(1/2)) + (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*c)/(2*b*d*log(F))

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+b(c+dx)^2} (c+dx)^2 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F**(a+b*(d*x+c)**2)*(d*x+c)**2,x)

[Out] Integral(F**(a + b*(c + d*x)**2)*(c + d*x)**2, x)

3.273 $\int F^{a+b(c+dx)^2}\,dx$

Optimal. Leaf size=44

$$\frac{\sqrt{\pi}\,F^a \operatorname{erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{2\sqrt{b}\,d\sqrt{\log(F)}}$$

```
[Out] 1/2*F^a*erfi((d*x+c)*b^(1/2)*ln(F)^(1/2))*Pi^(1/2)/d/b^(1/2)/ln(F)^(1/2)
```

Rubi [A] time = 0.01, antiderivative size = 44, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2204}

$$\frac{\sqrt{\pi}\,F^a \operatorname{Erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{2\sqrt{b}\,d\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2),x]
```

```
[Out] (F^a*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]])/(2*Sqrt[b]*d*Sqrt[Log[F
]])
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rubi steps

$$\int F^{a+b(c+dx)^2}\,dx = \frac{F^a\sqrt{\pi}\operatorname{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)}{2\sqrt{b}\,d\sqrt{\log(F)}}$$

Mathematica [A] time = 0.01, size = 44, normalized size = 1.00

$$\frac{\sqrt{\pi}\,F^a \operatorname{erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{2\sqrt{b}\,d\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2),x]
```

```
[Out] (F^a*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]])/(2*Sqrt[b]*d*Sqrt[Log[F
]])
```

fricas [A] time = 0.44, size = 48, normalized size = 1.09

$$-\frac{\sqrt{\pi}\sqrt{-bd^2\log(F)}F^a\operatorname{erf}\left(\frac{\sqrt{-bd^2\log(F)}(dx+c)}{d}\right)}{2\,bd^2\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2),x, algorithm="fricas")
```

```
[Out] -1/2*sqrt(pi)*sqrt(-b*d^2*log(F))*F^a*erf(sqrt(-b*d^2*log(F))*(d*x + c)/d)/
(b*d^2*log(F))
```

giac [A] time = 0.20, size = 36, normalized size = 0.82

$$-\frac{\sqrt{\pi}F^a\operatorname{erf}\left(-\sqrt{-b\log(F)}\,d\left(x+\frac{c}{d}\right)\right)}{2\sqrt{-b\log(F)}\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2),x, algorithm="giac")
```

```
[Out] -1/2*sqrt(pi)*F^a*erf(-sqrt(-b*log(F))*d*(x + c/d))/(sqrt(-b*log(F))*d)
```

maple [A] time = 0.05, size = 58, normalized size = 1.32

$$-\frac{\sqrt{\pi}\;F^{-b\,c^2}F^{b\,c^2+a}\operatorname{erf}\left(\frac{bc\ln(F)}{\sqrt{-b\ln(F)}}-\sqrt{-b\ln(F)}\;dx\right)}{2\sqrt{-b\ln(F)}\;d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+(d*x+c)^2*b),x)
```

```
[Out] -1/2*Pi^(1/2)*F^(b*c^2+a)*F^(-b*c^2)/d/(-b*ln(F))^(1/2)*erf(1/(-b*ln(F))^(1
/2)*b*c*ln(F)-(-b*ln(F))^(1/2)*d*x)
```

maxima [A] time = 0.96, size = 58, normalized size = 1.32

$$\frac{\sqrt{\pi}F^{bc^2+a}\operatorname{erf}\left(\sqrt{-b\log(F)}\,dx-\frac{bc\log(F)}{\sqrt{-b\log(F)}}\right)}{2\sqrt{-b\log(F)}\,F^{bc^2}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2),x, algorithm="maxima")
```

```
[Out] 1/2*sqrt(pi)*F^(b*c^2 + a)*erf(sqrt(-b*log(F))*d*x - b*c*log(F)/sqrt(-b*log
(F)))/(sqrt(-b*log(F))*F^(b*c^2)*d)
```

mupad [B] time = 0.04, size = 48, normalized size = 1.09

$$-\frac{F^a\,\sqrt{\pi}\,\mathrm{erf}\left(\frac{1\mathrm{i}\,b\,x\,\ln(F)\,d^2+1\mathrm{i}\,b\,c\,\ln(F)\,d}{\sqrt{b\,d^2\,\ln(F)}}\right)\,1\mathrm{i}}{2\,\sqrt{b\,d^2\,\ln(F)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2),x)
```

```
[Out] -(F^a*pi^(1/2)*erf((b*c*d*log(F)*1i + b*d^2*x*log(F)*1i)/(b*d^2*log(F))^(1/
2))*1i)/(2*(b*d^2*log(F))^(1/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+b(c+dx)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2),x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**2), x)
```

3.274 $\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^2}\,dx$

Optimal. Leaf size=67

$$\frac{\sqrt{\pi}\,\sqrt{b}\,F^a\sqrt{\log(F)}\,\mathrm{erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{d}-\frac{F^{a+b(c+dx)^2}}{d(c+dx)}$$

```
[Out] -F^(a+b*(d*x+c)^2)/d/(d*x+c)+F^a*erfi((d*x+c)*b^(1/2)*ln(F)^(1/2))*b^(1/2)*
Pi^(1/2)*ln(F)^(1/2)/d
```

Rubi [A] time = 0.08, antiderivative size = 67, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2214, 2204}

$$\frac{\sqrt{\pi}\,\sqrt{b}\,F^a\sqrt{\log(F)}\,\mathrm{Erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{d}-\frac{F^{a+b(c+dx)^2}}{d(c+dx)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)/(c + d*x)^2,x]
```

```
[Out] -(F^(a + b*(c + d*x)^2)/(d*(c + d*x))) + (Sqrt[b]*F^a*Sqrt[Pi]*Erfi[Sqrt[b]
*(c + d*x)*Sqrt[Log[F]]]*Sqrt[Log[F]])/d
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^2}\,dx = -\frac{F^{a+b(c+dx)^2}}{d(c+dx)} + (2b\log(F))\int F^{a+b(c+dx)^2}\,dx$$
$$= -\frac{F^{a+b(c+dx)^2}}{d(c+dx)} + \frac{\sqrt{b}\,F^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)\sqrt{\log(F)}}{d}$$

Mathematica [A] time = 0.05, size = 63, normalized size = 0.94

$$\frac{F^a\left(\sqrt{\pi}\,\sqrt{b}\,\sqrt{\log(F)}\,\mathrm{erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right) - \frac{F^{b(c+dx)^2}}{c+dx}\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)/(c + d*x)^2,x]
```

```
[Out] (F^a*(-(F^(b*(c + d*x)^2)/(c + d*x)) + Sqrt[b]*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d
*x)*Sqrt[Log[F]]]*Sqrt[Log[F]]))/d
```

fricas [A] time = 0.43, size = 83, normalized size = 1.24

$$-\frac{\sqrt{\pi}\,\sqrt{-bd^2\log(F)}\,(dx+c)F^a\,\mathrm{erf}\left(\frac{\sqrt{-bd^2\log(F)}\,(dx+c)}{d}\right) + F^{bd^2x^2+2\,bcdx+bc^2+a}d}{d^3x+cd^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^2,x, algorithm="fricas")
```

```
[Out] -(sqrt(pi)*sqrt(-b*d^2*log(F))*(d*x + c)*F^a*erf(sqrt(-b*d^2*log(F))*(d*x +
 c)/d) + F^(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a)*d)/(d^3*x + c*d^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^2b+a}}{(dx+c)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^2,x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^2*b + a)/(d*x + c)^2, x)
```

maple [A] time = 0.08, size = 62, normalized size = 0.93

$$\frac{\sqrt{\pi}\, b\, F^{a} \operatorname{erf}\left(\sqrt{-b \ln(F)}\, (dx+c)\right) \ln(F)}{\sqrt{-b \ln(F)}\, d} - \frac{F^{a} F^{(dx+c)^{2} b}}{(dx+c)\, d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+(d*x+c)^2*b)/(d*x+c)^2,x)
```

```
[Out] -1/d/(d*x+c)*F^((d*x+c)^2*b)*F^a+1/d*b*ln(F)*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*
erf((-b*ln(F))^(1/2)*(d*x+c))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^{2} b+a}}{(dx+c)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^2,x, algorithm="maxima")
```

```
[Out] integrate(F^((d*x + c)^2*b + a)/(d*x + c)^2, x)
```

mupad [B] time = 4.06, size = 86, normalized size = 1.28

$$\frac{F^{a}\, b\, \sqrt{\pi}\, \operatorname{erfi}\left(\frac{b\, x\, \ln(F)\, d^{2}+b\, c\, \ln(F)\, d}{\sqrt{b\, d^{2}\, \ln(F)}}\right) \ln(F)}{\sqrt{b\, d^{2}\, \ln(F)}} - \frac{F^{b\, d^{2}\, x^{2}}\, F^{a}\, F^{b\, c^{2}}\, F^{2\, b\, c\, d\, x}}{d\, (c+d\, x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)/(c + d*x)^2,x)
```

```
[Out] (F^a*b*pi^(1/2)*erfi((b*c*d*log(F) + b*d^2*x*log(F))/(b*d^2*log(F))^(1/2))*
log(F))/(b*d^2*log(F))^(1/2) - (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x))/
(d*(c + d*x))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b(c+dx)^{2}}}{(c+dx)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)/(d*x+c)**2,x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**2)/(c + d*x)**2, x)
```

3.275 $\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^4}\,dx$

Optimal. Leaf size=102

$$\frac{2\sqrt{\pi}\,b^{3/2}F^a\log^{\frac{3}{2}}(F)\operatorname{erfi}\left(\sqrt{b}\sqrt{\log(F)}\,(c+dx)\right)}{3d}-\frac{F^{a+b(c+dx)^2}}{3d(c+dx)^3}-\frac{2b\log(F)F^{a+b(c+dx)^2}}{3d(c+dx)}$$

```
[Out] -1/3*F^(a+b*(d*x+c)^2)/d/(d*x+c)^3-2/3*b*F^(a+b*(d*x+c)^2)*ln(F)/d/(d*x+c)+
2/3*b^(3/2)*F^a*erfi((d*x+c)*b^(1/2)*ln(F)^(1/2))*ln(F)^(3/2)*Pi^(1/2)/d
```

Rubi [A] time = 0.15, antiderivative size = 102, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2214, 2204}

$$\frac{2\sqrt{\pi}\,b^{3/2}F^a\log^{\frac{3}{2}}(F)\operatorname{Erfi}\left(\sqrt{b}\sqrt{\log(F)}\,(c+dx)\right)}{3d}-\frac{F^{a+b(c+dx)^2}}{3d(c+dx)^3}-\frac{2b\log(F)F^{a+b(c+dx)^2}}{3d(c+dx)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)/(c + d*x)^4,x]
```

```
[Out] -F^(a + b*(c + d*x)^2)/(3*d*(c + d*x)^3) - (2*b*F^(a + b*(c + d*x)^2)*Log[F
])/(3*d*(c + d*x)) + (2*b^(3/2)*F^a*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Lo
g[F]]]*Log[F]^(3/2))/(3*d)
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^4}\,dx = -\frac{F^{a+b(c+dx)^2}}{3d(c+dx)^3} + \frac{1}{3}(2b\log(F))\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^2}\,dx$$
$$= -\frac{F^{a+b(c+dx)^2}}{3d(c+dx)^3} - \frac{2bF^{a+b(c+dx)^2}\log(F)}{3d(c+dx)} + \frac{1}{3}\left(4b^2\log^2(F)\right)\int F^{a+b(c+dx)^2}\,dx$$
$$= -\frac{F^{a+b(c+dx)^2}}{3d(c+dx)^3} - \frac{2bF^{a+b(c+dx)^2}\log(F)}{3d(c+dx)} + \frac{2b^{3/2}F^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)\log^{\frac{3}{2}}(F)}{3d}$$

Mathematica [A] time = 0.10, size = 81, normalized size = 0.79

$$\frac{F^a\left(2\sqrt{\pi}\,b^{3/2}\log^{\frac{3}{2}}(F)\mathrm{erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right) - \frac{F^{b(c+dx)^2}\left(2b\log(F)(c+dx)^2+1\right)}{(c+dx)^3}\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)/(c + d*x)^4,x]
```

```
[Out] (F^a*(2*b^(3/2)*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]]*Log[F]^(3/2)
- (F^(b*(c + d*x)^2)*(1 + 2*b*(c + d*x)^2*Log[F]))/(c + d*x)^3))/(3*d)
```

fricas [A] time = 0.43, size = 163, normalized size = 1.60

$$-\frac{2\sqrt{\pi}\left(bd^3x^3 + 3\,bcd^2x^2 + 3\,bc^2dx + bc^3\right)\sqrt{-bd^2\log(F)}\,F^a\,\mathrm{erf}\left(\frac{\sqrt{-bd^2\log(F)}\,(dx+c)}{d}\right)\log(F) + \left(2\left(bd^3x^2 + 2\,bcd^2x + \right.\right.}{3\left(d^5x^3 + 3\,cd^4x^2 + 3\,c^2d^3x + c^3d^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^4,x, algorithm="fricas")
```

```
[Out] -1/3*(2*sqrt(pi)*(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3)*sqrt(-b*
d^2*log(F))*F^a*erf(sqrt(-b*d^2*log(F))*(d*x + c)/d)*log(F) + (2*(b*d^3*x^2
 + 2*b*c*d^2*x + b*c^2*d)*log(F) + d)*F^(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a)
)/(d^5*x^3 + 3*c*d^4*x^2 + 3*c^2*d^3*x + c^3*d^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^2b+a}}{(dx+c)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^4,x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^2*b + a)/(d*x + c)^4, x)
```

maple [A] time = 0.08, size = 96, normalized size = 0.94

$$\frac{2\sqrt{\pi}\, b^{2} F^{a} \operatorname{erf}\left(\sqrt{-b\ln(F)}\ (dx+c)\right)\ln(F)^{2}}{3\sqrt{-b\ln(F)}\ d} - \frac{2b\,F^{a}F^{(dx+c)^{2}b}\ln(F)}{3\,(dx+c)\,d} - \frac{F^{a}F^{(dx+c)^{2}b}}{3\,(dx+c)^{3}\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+(d*x+c)^2*b)/(d*x+c)^4,x)
```

```
[Out] -1/3/d/(d*x+c)^3*F^((d*x+c)^2*b)*F^a-2/3/d*b*ln(F)/(d*x+c)*F^((d*x+c)^2*b)*
F^a+2/3/d*b^2*ln(F)^2*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*erf((-b*ln(F))^(1/2)*(d
*x+c))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^{2}b+a}}{(dx+c)^{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^4,x, algorithm="maxima")
```

```
[Out] integrate(F^((d*x + c)^2*b + a)/(d*x + c)^4, x)
```

mupad [B] time = 5.03, size = 201, normalized size = 1.97

$$\frac{2\,F^{a}\,b^{2}\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b\,x\,\ln(F)\,d^{2}+b\,c\,\ln(F)\,d}{\sqrt{b\,d^{2}\,\ln(F)}}\right)\ln(F)^{2}}{3\,\sqrt{b\,d^{2}\,\ln(F)}} - \frac{F^{b\,d^{2}\,x^{2}}\,F^{a}\,F^{b\,c^{2}}\,F^{2\,b\,c\,d\,x}\left(\frac{1}{3\,d}+\frac{2\,b\,c^{2}\,\ln(F)}{3\,d}\right)+\frac{4\,F^{b\,d^{2}\,x^{2}}\,F^{a}\,F^{b\,c^{2}}\,F^{2\,b\,c\,d\,x}\,b\,c\,x\,\ln(}{3}}{c^{3}+3\,c^{2}\,d\,x+3\,c\,d^{2}\,x^{2}+d^{3}\,x^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)/(c + d*x)^4,x)
```

```
[Out] (2*F^a*b^2*pi^(1/2)*erfi((b*c*d*log(F) + b*d^2*x*log(F))/(b*d^2*log(F))^(1/
2))*log(F)^2)/(3*(b*d^2*log(F))^(1/2)) - (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*
b*c*d*x)*(1/(3*d) + (2*b*c^2*log(F))/(3*d)) + (4*F^(b*d^2*x^2)*F^a*F^(b*c^2
)*F^(2*b*c*d*x)*b*c*x*log(F))/3 + (2*F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d
*x)*b*d*x^2*log(F))/3)/(c^3 + d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b(c+dx)^{2}}}{(c+dx)^{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)/(d*x+c)**4,x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**2)/(c + d*x)**4, x)
```

3.276 $\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^6} dx$

Optimal. Leaf size=136

$$\frac{4\sqrt{\pi}\, b^{5/2} F^a \log^{\frac{5}{2}}(F) \operatorname{erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{15d} - \frac{4b^2 \log^2(F) F^{a+b(c+dx)^2}}{15d(c+dx)} - \frac{F^{a+b(c+dx)^2}}{5d(c+dx)^5} - \frac{2b \log(F) F^{a+b(c+dx)^2}}{15d(c+dx)^3}$$

```
[Out] -1/5*F^(a+b*(d*x+c)^2)/d/(d*x+c)^5-2/15*b*F^(a+b*(d*x+c)^2)*ln(F)/d/(d*x+c)
^3-4/15*b^2*F^(a+b*(d*x+c)^2)*ln(F)^2/d/(d*x+c)+4/15*b^(5/2)*F^a*erfi((d*x+
c)*b^(1/2)*ln(F)^(1/2))*ln(F)^(5/2)*Pi^(1/2)/d
```

Rubi [A] time = 0.22, antiderivative size = 136, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2214, 2204}

$$\frac{4\sqrt{\pi}\, b^{5/2} F^a \log^{\frac{5}{2}}(F) \operatorname{Erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{15d} - \frac{4b^2 \log^2(F) F^{a+b(c+dx)^2}}{15d(c+dx)} - \frac{F^{a+b(c+dx)^2}}{5d(c+dx)^5} - \frac{2b \log(F) F^{a+b(c+dx)^2}}{15d(c+dx)^3}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)/(c + d*x)^6,x]
```

```
[Out] -F^(a + b*(c + d*x)^2)/(5*d*(c + d*x)^5) - (2*b*F^(a + b*(c + d*x)^2)*Log[F
])/(15*d*(c + d*x)^3) - (4*b^2*F^(a + b*(c + d*x)^2)*Log[F]^2)/(15*d*(c + d
*x)) + (4*b^(5/2)*F^a*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]]*Log[F]^
(5/2))/(15*d)
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^6}\,dx = -\frac{F^{a+b(c+dx)^2}}{5d(c+dx)^5} + \frac{1}{5}(2b\log(F))\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^4}\,dx$$
$$= -\frac{F^{a+b(c+dx)^2}}{5d(c+dx)^5} - \frac{2bF^{a+b(c+dx)^2}\log(F)}{15d(c+dx)^3} + \frac{1}{15}\left(4b^2\log^2(F)\right)\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^2}\,dx$$
$$= -\frac{F^{a+b(c+dx)^2}}{5d(c+dx)^5} - \frac{2bF^{a+b(c+dx)^2}\log(F)}{15d(c+dx)^3} - \frac{4b^2F^{a+b(c+dx)^2}\log^2(F)}{15d(c+dx)} + \frac{1}{15}\left(8b^3\log^3(F)\right)\int F^{a+b(c+dx)^2}$$
$$= -\frac{F^{a+b(c+dx)^2}}{5d(c+dx)^5} - \frac{2bF^{a+b(c+dx)^2}\log(F)}{15d(c+dx)^3} - \frac{4b^2F^{a+b(c+dx)^2}\log^2(F)}{15d(c+dx)} + \frac{4b^{5/2}F^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\cdots}\right.}{15d}$$

Mathematica [A] time = 0.12, size = 97, normalized size = 0.71

$$\frac{F^a\left(4\sqrt{\pi}\,b^{5/2}\log^{\frac{5}{2}}(F)\mathrm{erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right) - \frac{F^{b(c+dx)^2}\left(4b^2\log^2(F)(c+dx)^4+2b\log(F)(c+dx)^2+3\right)}{(c+dx)^5}\right)}{15d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)/(c + d*x)^6,x]
```

```
[Out] (F^a*(4*b^(5/2)*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]]*Log[F]^(5/2)
- (F^(b*(c + d*x)^2)*(3 + 2*b*(c + d*x)^2*Log[F] + 4*b^2*(c + d*x)^4*Log[F]
^2))/(c + d*x)^5))/(15*d)
```

fricas [B] time = 0.44, size = 288, normalized size = 2.12

$$-\frac{4\sqrt{\pi}\left(b^2d^5x^5 + 5\,b^2cd^4x^4 + 10\,b^2c^2d^3x^3 + 10\,b^2c^3d^2x^2 + 5\,b^2c^4dx + b^2c^5\right)\sqrt{-bd^2\log(F)}\,F^a\,\mathrm{erf}\left(\frac{\sqrt{-bd^2\log(F)}\,(dx+c)}{d}\right.}{15\left(d^7x^5 + 5\,cd^6x\cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^6,x, algorithm="fricas")
```

```
[Out] -1/15*(4*sqrt(pi)*(b^2*d^5*x^5 + 5*b^2*c*d^4*x^4 + 10*b^2*c^2*d^3*x^3 + 10*
b^2*c^3*d^2*x^2 + 5*b^2*c^4*d*x + b^2*c^5)*sqrt(-b*d^2*log(F))*F^a*erf(sqrt
(-b*d^2*log(F))*(d*x + c)/d)*log(F)^2 + (4*(b^2*d^5*x^4 + 4*b^2*c*d^4*x^3 +
 6*b^2*c^2*d^3*x^2 + 4*b^2*c^3*d^2*x + b^2*c^4*d)*log(F)^2 + 2*(b*d^3*x^2 +
 2*b*c*d^2*x + b*c^2*d)*log(F) + 3*d)*F^(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a)
)/(d^7*x^5 + 5*c*d^6*x^4 + 10*c^2*d^5*x^3 + 10*c^3*d^4*x^2 + 5*c^4*d^3*x +
c^5*d^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^2b+a}}{(dx+c)^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^6,x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^2*b + a)/(d*x + c)^6, x)
```

maple [A] time = 0.09, size = 129, normalized size = 0.95

$$\frac{4\sqrt{\pi}\,b^3F^a\,\mathrm{erf}\left(\sqrt{-b\ln(F)}\,\,(dx+c)\right)\ln(F)^3}{15\sqrt{-b\ln(F)}\,d}-\frac{4b^2F^aF^{(dx+c)^2b}\ln(F)^2}{15\,(dx+c)\,d}-\frac{2b\,F^aF^{(dx+c)^2b}\ln(F)}{15\,(dx+c)^3\,d}-\frac{F^aF^{(dx+c)^2b}}{5\,(dx+c)^5\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+(d*x+c)^2*b)/(d*x+c)^6,x)
```

```
[Out] -1/5/d/(d*x+c)^5*F^((d*x+c)^2*b)*F^a-2/15/d*b*ln(F)/(d*x+c)^3*F^((d*x+c)^2*
b)*F^a-4/15/d*b^2*ln(F)^2/(d*x+c)*F^((d*x+c)^2*b)*F^a+4/15/d*b^3*ln(F)^3*Pi
^(1/2)*F^a/(-b*ln(F))^(1/2)*erf((-b*ln(F))^(1/2)*(d*x+c))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^2b+a}}{(dx+c)^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^6,x, algorithm="maxima")
```

```
[Out] integrate(F^((d*x + c)^2*b + a)/(d*x + c)^6, x)
```

mupad [B] time = 4.87, size = 168, normalized size = 1.24

$$\frac{4\,F^a\,\sqrt{\pi}\,\mathrm{erfc}\left(\sqrt{-b\,\ln(F)\,(c+d\,x)^2}\right)\,\left(-b\,\ln(F)\,(c+d\,x)^2\right)^{5/2}}{15\,d\,(c+d\,x)^5}-\frac{4\,F^a\,\sqrt{\pi}\,\left(-b\,\ln(F)\,(c+d\,x)^2\right)^{5/2}}{15\,d\,(c+d\,x)^5}-\frac{4\,F^a\,F^{b\,(c+d\,x)^2}\,b}{15\,d\,\,(c+d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)/(c + d*x)^6,x)
```

```
[Out] (4*F^a*pi^(1/2)*erfc((-b*log(F)*(c + d*x)^2)^(1/2))*(-b*log(F)*(c + d*x)^2)
^(5/2))/(15*d*(c + d*x)^5) - (4*F^a*pi^(1/2)*(-b*log(F)*(c + d*x)^2)^(5/2))
/(15*d*(c + d*x)^5) - (4*F^a*F^(b*(c + d*x)^2)*b^2*log(F)^2)/(15*d*(c + d*x
)) - (2*F^a*F^(b*(c + d*x)^2)*b*log(F))/(15*d*(c + d*x)^3) - (F^a*F^(b*(c +
 d*x)^2))/(5*d*(c + d*x)^5)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)/(d*x+c)**6,x)
```

```
[Out] Timed out
```

3.277 $\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^8} dx$

Optimal. Leaf size=170

$$\frac{8\sqrt{\pi}\, b^{7/2} F^a \log^{\frac{7}{2}}(F)\text{erfi}\left(\sqrt{b}\sqrt{\log(F)}\,(c+dx)\right)}{105d}-\frac{8b^3\log^3(F)F^{a+b(c+dx)^2}}{105d(c+dx)}-\frac{4b^2\log^2(F)F^{a+b(c+dx)^2}}{105d(c+dx)^3}-\frac{F^{a+b(c+dx)^2}}{7d(c+dx)^7}-\frac{2b}{}$$

```
[Out] -1/7*F^(a+b*(d*x+c)^2)/d/(d*x+c)^7-2/35*b*F^(a+b*(d*x+c)^2)*ln(F)/d/(d*x+c)
^5-4/105*b^2*F^(a+b*(d*x+c)^2)*ln(F)^2/d/(d*x+c)^3-8/105*b^3*F^(a+b*(d*x+c)
^2)*ln(F)^3/d/(d*x+c)+8/105*b^(7/2)*F^a*erfi((d*x+c)*b^(1/2)*ln(F)^(1/2))*l
n(F)^(7/2)*Pi^(1/2)/d
```

Rubi [A] time = 0.29, antiderivative size = 170, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2214, 2204}

$$\frac{8\sqrt{\pi}\, b^{7/2} F^a \log^{\frac{7}{2}}(F)\text{Erfi}\left(\sqrt{b}\sqrt{\log(F)}\,(c+dx)\right)}{105d}-\frac{8b^3\log^3(F)F^{a+b(c+dx)^2}}{105d(c+dx)}-\frac{4b^2\log^2(F)F^{a+b(c+dx)^2}}{105d(c+dx)^3}-\frac{F^{a+b(c+dx)^2}}{7d(c+dx)^7}-\frac{2b}{}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)/(c + d*x)^8,x]
```

```
[Out] -F^(a + b*(c + d*x)^2)/(7*d*(c + d*x)^7) - (2*b*F^(a + b*(c + d*x)^2)*Log[F
])/(35*d*(c + d*x)^5) - (4*b^2*F^(a + b*(c + d*x)^2)*Log[F]^2)/(105*d*(c +
d*x)^3) - (8*b^3*F^(a + b*(c + d*x)^2)*Log[F]^3)/(105*d*(c + d*x)) + (8*b^(
7/2)*F^a*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]]*Log[F]^(7/2))/(105*d
)
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$
\begin{aligned}
\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^8}\,dx &= -\frac{F^{a+b(c+dx)^2}}{7d(c+dx)^7}+\frac{1}{7}(2b\log(F))\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^6}\,dx\\
&= -\frac{F^{a+b(c+dx)^2}}{7d(c+dx)^7}-\frac{2bF^{a+b(c+dx)^2}\log(F)}{35d(c+dx)^5}+\frac{1}{35}\left(4b^2\log^2(F)\right)\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^4}\,dx\\
&= -\frac{F^{a+b(c+dx)^2}}{7d(c+dx)^7}-\frac{2bF^{a+b(c+dx)^2}\log(F)}{35d(c+dx)^5}-\frac{4b^2F^{a+b(c+dx)^2}\log^2(F)}{105d(c+dx)^3}+\frac{1}{105}\left(8b^3\log^3(F)\right)\int \frac{F^{a+b(c+d}}{(c+dx}\\
&= -\frac{F^{a+b(c+dx)^2}}{7d(c+dx)^7}-\frac{2bF^{a+b(c+dx)^2}\log(F)}{35d(c+dx)^5}-\frac{4b^2F^{a+b(c+dx)^2}\log^2(F)}{105d(c+dx)^3}-\frac{8b^3F^{a+b(c+dx)^2}\log^3(F)}{105d(c+dx)}+\frac{1}{105}\\
&= -\frac{F^{a+b(c+dx)^2}}{7d(c+dx)^7}-\frac{2bF^{a+b(c+dx)^2}\log(F)}{35d(c+dx)^5}-\frac{4b^2F^{a+b(c+dx)^2}\log^2(F)}{105d(c+dx)^3}-\frac{8b^3F^{a+b(c+dx)^2}\log^3(F)}{105d(c+dx)}+\frac{8b^{7/2}}{}
\end{aligned}
$$

Mathematica [A] time = 0.15, size = 112, normalized size = 0.66

$$
\frac{F^a\left(8\sqrt{\pi}\,b^{7/2}\log^{\frac{7}{2}}(F)\mathrm{erfi}\left(\sqrt{b}\sqrt{\log(F)}\,(c+dx)\right)+\frac{F^{b(c+dx)^2}\left(-8b^3\log^3(F)(c+dx)^6-4b^2\log^2(F)(c+dx)^4-6b\log(F)(c+dx)^2-15\right)}{(c+dx)^7}\right)}{105d}
$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)/(c + d*x)^8,x]
```

```
[Out] (F^a*(8*b^(7/2)*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]]*Log[F]^(7/2)
+ (F^(b*(c + d*x)^2)*(-15 - 6*b*(c + d*x)^2*Log[F] - 4*b^2*(c + d*x)^4*Log[
F]^2 - 8*b^3*(c + d*x)^6*Log[F]^3))/(c + d*x)^7))/(105*d)
```

fricas [B] time = 0.44, size = 429, normalized size = 2.52

$$
-\frac{8\sqrt{\pi}\left(b^3d^7x^7+7\,b^3cd^6x^6+21\,b^3c^2d^5x^5+35\,b^3c^3d^4x^4+35\,b^3c^4d^3x^3+21\,b^3c^5d^2x^2+7\,b^3c^6dx+b^3c^7\right)\sqrt{-bd^2\log}}{}
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^8,x, algorithm="fricas")
```

```
[Out] -1/105*(8*sqrt(pi)*(b^3*d^7*x^7 + 7*b^3*c*d^6*x^6 + 21*b^3*c^2*d^5*x^5 + 35
*b^3*c^3*d^4*x^4 + 35*b^3*c^4*d^3*x^3 + 21*b^3*c^5*d^2*x^2 + 7*b^3*c^6*d*x
+ b^3*c^7)*sqrt(-b*d^2*log(F))*F^a*erf(sqrt(-b*d^2*log(F))*(d*x + c)/d)*log
(F)^3 + (8*(b^3*d^7*x^6 + 6*b^3*c*d^6*x^5 + 15*b^3*c^2*d^5*x^4 + 20*b^3*c^3
```

```
*d^4*x^3 + 15*b^3*c^4*d^3*x^2 + 6*b^3*c^5*d^2*x + b^3*c^6*d)*log(F)^3 + 4*(
b^2*d^5*x^4 + 4*b^2*c*d^4*x^3 + 6*b^2*c^2*d^3*x^2 + 4*b^2*c^3*d^2*x + b^2*c
^4*d)*log(F)^2 + 6*(b*d^3*x^2 + 2*b*c*d^2*x + b*c^2*d)*log(F) + 15*d)*F^(b*
d^2*x^2 + 2*b*c*d*x + b*c^2 + a))/(d^9*x^7 + 7*c*d^8*x^6 + 21*c^2*d^7*x^5 +
 35*c^3*d^6*x^4 + 35*c^4*d^5*x^3 + 21*c^5*d^4*x^2 + 7*c^6*d^3*x + c^7*d^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^2b+a}}{(dx+c)^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^8,x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^2*b + a)/(d*x + c)^8, x)
```

maple [A] time = 0.12, size = 162, normalized size = 0.95

$$\frac{8\sqrt{\pi}\, b^4 F^a \operatorname{erf}\left(\sqrt{-b\ln(F)}\,\,(dx+c)\right)\ln(F)^4}{105\sqrt{-b\ln(F)}\,d}-\frac{8b^3F^aF^{(dx+c)^2b}\ln(F)^3}{105\,(dx+c)\,d}-\frac{4b^2F^aF^{(dx+c)^2b}\ln(F)^2}{105\,(dx+c)^3\,d}-\frac{2b\,F^aF^{(dx+c)^2b}\ln(F)}{35\,(dx+c)^5\,d}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+(d*x+c)^2*b)/(d*x+c)^8,x)
```

```
[Out] -1/7/d/(d*x+c)^7*F^((d*x+c)^2*b)*F^a-2/35/d*b*ln(F)/(d*x+c)^5*F^((d*x+c)^2*
b)*F^a-4/105/d*b^2*ln(F)^2/(d*x+c)^3*F^((d*x+c)^2*b)*F^a-8/105/d*b^3*ln(F)^
3/(d*x+c)*F^((d*x+c)^2*b)*F^a+8/105/d*b^4*ln(F)^4*Pi^(1/2)*F^a/(-b*ln(F))^(
1/2)*erf((-b*ln(F))^(1/2)*(d*x+c))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^2b+a}}{(dx+c)^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^8,x, algorithm="maxima")
```

```
[Out] integrate(F^((d*x + c)^2*b + a)/(d*x + c)^8, x)
```

mupad [B] time = 4.13, size = 201, normalized size = 1.18

$$\frac{8\,F^a\,\sqrt{\pi}\,\left(-b\,\ln(F)\,(c+d\,x)^2\right)^{7/2}}{105\,d\,(c+d\,x)^7}-\frac{F^a\,F^{b\,(c+d\,x)^2}}{7\,d\,(c+d\,x)^7}-\frac{4\,F^a\,F^{b\,(c+d\,x)^2}\,b^2\,\ln(F)^2}{105\,d\,(c+d\,x)^3}-\frac{8\,F^a\,F^{b\,(c+d\,x)^2}\,b^3\,\ln(F)^3}{105\,d\,\,(c+d\,x)}-\frac{2\,F^a\,F^{b\,(c+d\,x)^2}}{35\,d\,(c+d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)/(c + d*x)^8,x)
```

```
[Out] (8*F^a*pi^(1/2)*(-b*log(F)*(c + d*x)^2)^(7/2))/(105*d*(c + d*x)^7) - (F^a*F
^(b*(c + d*x)^2))/(7*d*(c + d*x)^7) - (4*F^a*F^(b*(c + d*x)^2)*b^2*log(F)^2
)/(105*d*(c + d*x)^3) - (8*F^a*F^(b*(c + d*x)^2)*b^3*log(F)^3)/(105*d*(c +
d*x)) - (2*F^a*F^(b*(c + d*x)^2)*b*log(F))/(35*d*(c + d*x)^5) - (8*F^a*pi^(
1/2)*erfc((-b*log(F)*(c + d*x)^2)^(1/2))*(-b*log(F)*(c + d*x)^2)^(7/2))/(10
5*d*(c + d*x)^7)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)/(d*x+c)**8,x)
```

```
[Out] Timed out
```

3.278 $\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^{10}} dx$

Optimal. Leaf size=49

$$-\frac{F^a \left(-b\log(F)(c+dx)^2\right)^{9/2} \Gamma\left(-\frac{9}{2}, -b(c+dx)^2\log(F)\right)}{2d(c+dx)^9}$$

```
[Out] -1/2*F^a*(-32/945*Pi^(1/2)*erfc((-b*(d*x+c)^2*ln(F))^(1/2))+32/945/(-b*(d*x
+c)^2*ln(F))^(1/2)*exp(b*(d*x+c)^2*ln(F))-16/945/(-b*(d*x+c)^2*ln(F))^(3/2)
*exp(b*(d*x+c)^2*ln(F))+8/315/(-b*(d*x+c)^2*ln(F))^(5/2)*exp(b*(d*x+c)^2*ln
(F))-4/63/(-b*(d*x+c)^2*ln(F))^(7/2)*exp(b*(d*x+c)^2*ln(F))+2/9/(-b*(d*x+c)
^2*ln(F))^(9/2)*exp(b*(d*x+c)^2*ln(F)))*(-b*(d*x+c)^2*ln(F))^(9/2)/d/(d*x+c
)^9
```

Rubi [A] time = 0.06, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2218}

$$-\frac{F^a \left(-b\log(F)(c+dx)^2\right)^{9/2} \text{Gamma}\left(-\frac{9}{2}, -b\log(F)(c+dx)^2\right)}{2d(c+dx)^9}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)/(c + d*x)^10,x]
```

```
[Out] -(F^a*Gamma[-9/2, -(b*(c + d*x)^2*Log[F])]*(-(b*(c + d*x)^2*Log[F]))^(9/2))
/(2*d*(c + d*x)^9)
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^{10}} dx = -\frac{F^a\Gamma\left(-\frac{9}{2}, -b(c+dx)^2\log(F)\right)\left(-b(c+dx)^2\log(F)\right)^{9/2}}{2d(c+dx)^9}$$

Mathematica [A] time = 0.03, size = 49, normalized size = 1.00

$$-\frac{F^a\left(-b\log(F)(c+dx)^2\right)^{9/2}\Gamma\left(-\frac{9}{2},-b(c+dx)^2\log(F)\right)}{2d(c+dx)^9}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)/(c + d*x)^10,x]
```

```
[Out] -1/2*(F^a*Gamma[-9/2, -(b*(c + d*x)^2*Log[F])]*(-(b*(c + d*x)^2*Log[F]))^(9
/2))/(d*(c + d*x)^9)
```

fricas [B] time = 0.47, size = 598, normalized size = 12.20

$$-\frac{16\sqrt{\pi}\left(b^4d^9x^9+9\,b^4cd^8x^8+36\,b^4c^2d^7x^7+84\,b^4c^3d^6x^6+126\,b^4c^4d^5x^5+126\,b^4c^5d^4x^4+84\,b^4c^6d^3x^3+36\,b^4c^7\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^10,x, algorithm="fricas")
```

```
[Out] -1/945*(16*sqrt(pi)*(b^4*d^9*x^9 + 9*b^4*c*d^8*x^8 + 36*b^4*c^2*d^7*x^7 + 8
4*b^4*c^3*d^6*x^6 + 126*b^4*c^4*d^5*x^5 + 126*b^4*c^5*d^4*x^4 + 84*b^4*c^6*
d^3*x^3 + 36*b^4*c^7*d^2*x^2 + 9*b^4*c^8*d*x + b^4*c^9)*sqrt(-b*d^2*log(F))
*F^a*erf(sqrt(-b*d^2*log(F))*(d*x + c)/d)*log(F)^4 + (16*(b^4*d^9*x^8 + 8*b
^4*c*d^8*x^7 + 28*b^4*c^2*d^7*x^6 + 56*b^4*c^3*d^6*x^5 + 70*b^4*c^4*d^5*x^4
 + 56*b^4*c^5*d^4*x^3 + 28*b^4*c^6*d^3*x^2 + 8*b^4*c^7*d^2*x + b^4*c^8*d)*l
og(F)^4 + 8*(b^3*d^7*x^6 + 6*b^3*c*d^6*x^5 + 15*b^3*c^2*d^5*x^4 + 20*b^3*c^
3*d^4*x^3 + 15*b^3*c^4*d^3*x^2 + 6*b^3*c^5*d^2*x + b^3*c^6*d)*log(F)^3 + 12
*(b^2*d^5*x^4 + 4*b^2*c*d^4*x^3 + 6*b^2*c^2*d^3*x^2 + 4*b^2*c^3*d^2*x + b^2
*c^4*d)*log(F)^2 + 30*(b*d^3*x^2 + 2*b*c*d^2*x + b*c^2*d)*log(F) + 105*d)*F
^(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a))/(d^11*x^9 + 9*c*d^10*x^8 + 36*c^2*d^9
*x^7 + 84*c^3*d^8*x^6 + 126*c^4*d^7*x^5 + 126*c^5*d^6*x^4 + 84*c^6*d^5*x^3
+ 36*c^7*d^4*x^2 + 9*c^8*d^3*x + c^9*d^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^2b+a}}{(dx+c)^{10}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^10,x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^2*b + a)/(d*x + c)^10, x)
```

maple [A] time = 0.16, size = 195, normalized size = 3.98

$$\frac{16\sqrt{\pi}\, b^5 F^a \operatorname{erf}\left(\sqrt{-b\ln(F)}\ (dx+c)\right)\ln(F)^5}{945\sqrt{-b\ln(F)}\ d}-\frac{16b^4F^aF^{(dx+c)^2b}\ln(F)^4}{945\,(dx+c)\,d}-\frac{8b^3F^aF^{(dx+c)^2b}\ln(F)^3}{945\,(dx+c)^3\,d}-\frac{4b^2F^aF^{(dx+c)^2b}\ln(F)}{315\,(dx+c)^5\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+(d*x+c)^2*b)/(d*x+c)^10,x)
```

```
[Out] -1/9/d/(d*x+c)^9*F^((d*x+c)^2*b)*F^a-2/63/d*b*ln(F)/(d*x+c)^7*F^((d*x+c)^2*
b)*F^a-4/315/d*b^2*ln(F)^2/(d*x+c)^5*F^((d*x+c)^2*b)*F^a-8/945/d*b^3*ln(F)^
3/(d*x+c)^3*F^((d*x+c)^2*b)*F^a-16/945/d*b^4*ln(F)^4/(d*x+c)*F^((d*x+c)^2*b
)*F^a+16/945/d*b^5*ln(F)^5*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*erf((-b*ln(F))^(1/
2)*(d*x+c))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^2b+a}}{(dx+c)^{10}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^10,x, algorithm="maxima")
```

```
[Out] integrate(F^((d*x + c)^2*b + a)/(d*x + c)^10, x)
```

mupad [B] time = 4.09, size = 234, normalized size = 4.78

$$\frac{16\,F^a\,\sqrt{\pi}\,\operatorname{erfc}\left(\sqrt{-b\,\ln(F)\,(c+d\,x)^2}\right)\,\left(-b\,\ln(F)\,(c+d\,x)^2\right)^{9/2}}{945\,d\,(c+d\,x)^9}-\frac{16\,F^a\,\sqrt{\pi}\,\left(-b\,\ln(F)\,(c+d\,x)^2\right)^{9/2}}{945\,d\,(c+d\,x)^9}-\frac{4\,F^a\,F^{b\,(c+d\,x)^2}}{315\,d\,(c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)/(c + d*x)^10,x)
```

```
[Out] (16*F^a*pi^(1/2)*erfc((-b*log(F)*(c + d*x)^2)^(1/2))*(-b*log(F)*(c + d*x)^2
)^(9/2))/(945*d*(c + d*x)^9) - (16*F^a*pi^(1/2)*(-b*log(F)*(c + d*x)^2)^(9/
2))/(945*d*(c + d*x)^9) - (4*F^a*F^(b*(c + d*x)^2)*b^2*log(F)^2)/(315*d*(c
+ d*x)^5) - (8*F^a*F^(b*(c + d*x)^2)*b^3*log(F)^3)/(945*d*(c + d*x)^3) - (1
6*F^a*F^(b*(c + d*x)^2)*b^4*log(F)^4)/(945*d*(c + d*x)) - (2*F^a*F^(b*(c +
d*x)^2)*b*log(F))/(63*d*(c + d*x)^7) - (F^a*F^(b*(c + d*x)^2))/(9*d*(c + d*
x)^9)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)/(d*x+c)**10,x)
```

```
[Out] Timed out
```

3.279 $\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^{12}} dx$

Optimal. Leaf size=49

$$-\frac{F^a \left(-b \log(F)(c+dx)^2\right)^{11/2} \Gamma\left(-\frac{11}{2}, -b(c+dx)^2 \log(F)\right)}{2d(c+dx)^{11}}$$

```
[Out] -1/2*F^a*(64/10395*Pi^(1/2)*erfc((-b*(d*x+c)^2*ln(F))^(1/2))-64/10395/(-b*(
d*x+c)^2*ln(F))^(1/2)*exp(b*(d*x+c)^2*ln(F))+32/10395/(-b*(d*x+c)^2*ln(F))^
(3/2)*exp(b*(d*x+c)^2*ln(F))-16/3465/(-b*(d*x+c)^2*ln(F))^(5/2)*exp(b*(d*x+
c)^2*ln(F))+8/693/(-b*(d*x+c)^2*ln(F))^(7/2)*exp(b*(d*x+c)^2*ln(F))-4/99/(-
b*(d*x+c)^2*ln(F))^(9/2)*exp(b*(d*x+c)^2*ln(F))+2/11/(-b*(d*x+c)^2*ln(F))^(
11/2)*exp(b*(d*x+c)^2*ln(F)))*(-b*(d*x+c)^2*ln(F))^(11/2)/d/(d*x+c)^11
```

Rubi [A] time = 0.06, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2218}

$$-\frac{F^a \left(-b \log(F)(c+dx)^2\right)^{11/2} \text{Gamma}\left(-\frac{11}{2}, -b \log(F)(c+dx)^2\right)}{2d(c+dx)^{11}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)/(c + d*x)^12,x]
```

```
[Out] -(F^a*Gamma[-11/2, -(b*(c + d*x)^2*Log[F])]*(-(b*(c + d*x)^2*Log[F]))^(11/2
))/(2*d*(c + d*x)^11)
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^2}}{(c+dx)^{12}} dx = -\frac{F^a \Gamma\left(-\frac{11}{2}, -b(c+dx)^2 \log(F)\right) \left(-b(c+dx)^2 \log(F)\right)^{11/2}}{2d(c+dx)^{11}}$$

Mathematica [A] time = 0.03, size = 49, normalized size = 1.00

$$-\frac{F^a\left(-b\log(F)(c+dx)^2\right)^{11/2}\Gamma\left(-\frac{11}{2},-b(c+dx)^2\log(F)\right)}{2d(c+dx)^{11}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)/(c + d*x)^12,x]
```

```
[Out] -1/2*(F^a*Gamma[-11/2, -(b*(c + d*x)^2*Log[F])]*(-(b*(c + d*x)^2*Log[F]))^(
11/2))/(d*(c + d*x)^11)
```

fricas [B] time = 0.45, size = 795, normalized size = 16.22

$$-\frac{32\sqrt{\pi}\left(b^5d^{11}x^{11}+11\,b^5cd^{10}x^{10}+55\,b^5c^2d^9x^9+165\,b^5c^3d^8x^8+330\,b^5c^4d^7x^7+462\,b^5c^5d^6x^6+462\,b^5c^6d^5x^5+\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^12,x, algorithm="fricas")
```

```
[Out] -1/10395*(32*sqrt(pi)*(b^5*d^11*x^11 + 11*b^5*c*d^10*x^10 + 55*b^5*c^2*d^9*
x^9 + 165*b^5*c^3*d^8*x^8 + 330*b^5*c^4*d^7*x^7 + 462*b^5*c^5*d^6*x^6 + 462
*b^5*c^6*d^5*x^5 + 330*b^5*c^7*d^4*x^4 + 165*b^5*c^8*d^3*x^3 + 55*b^5*c^9*d
^2*x^2 + 11*b^5*c^10*d*x + b^5*c^11)*sqrt(-b*d^2*log(F))*F^a*erf(sqrt(-b*d^
2*log(F))*(d*x + c)/d)*log(F)^5 + (32*(b^5*d^11*x^10 + 10*b^5*c*d^10*x^9 +
45*b^5*c^2*d^9*x^8 + 120*b^5*c^3*d^8*x^7 + 210*b^5*c^4*d^7*x^6 + 252*b^5*c^
5*d^6*x^5 + 210*b^5*c^6*d^5*x^4 + 120*b^5*c^7*d^4*x^3 + 45*b^5*c^8*d^3*x^2
+ 10*b^5*c^9*d^2*x + b^5*c^10*d)*log(F)^5 + 16*(b^4*d^9*x^8 + 8*b^4*c*d^8*x
^7 + 28*b^4*c^2*d^7*x^6 + 56*b^4*c^3*d^6*x^5 + 70*b^4*c^4*d^5*x^4 + 56*b^4*
c^5*d^4*x^3 + 28*b^4*c^6*d^3*x^2 + 8*b^4*c^7*d^2*x + b^4*c^8*d)*log(F)^4 +
24*(b^3*d^7*x^6 + 6*b^3*c*d^6*x^5 + 15*b^3*c^2*d^5*x^4 + 20*b^3*c^3*d^4*x^3
 + 15*b^3*c^4*d^3*x^2 + 6*b^3*c^5*d^2*x + b^3*c^6*d)*log(F)^3 + 60*(b^2*d^5
*x^4 + 4*b^2*c*d^4*x^3 + 6*b^2*c^2*d^3*x^2 + 4*b^2*c^3*d^2*x + b^2*c^4*d)*l
og(F)^2 + 210*(b*d^3*x^2 + 2*b*c*d^2*x + b*c^2*d)*log(F) + 945*d)*F^(b*d^2*
x^2 + 2*b*c*d*x + b*c^2 + a))/(d^13*x^11 + 11*c*d^12*x^10 + 55*c^2*d^11*x^9
 + 165*c^3*d^10*x^8 + 330*c^4*d^9*x^7 + 462*c^5*d^8*x^6 + 462*c^6*d^7*x^5 +
 330*c^7*d^6*x^4 + 165*c^8*d^5*x^3 + 55*c^9*d^4*x^2 + 11*c^10*d^3*x + c^11*
d^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^2b+a}}{(dx+c)^{12}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^12,x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^2*b + a)/(d*x + c)^12, x)
```

maple [A] time = 0.22, size = 228, normalized size = 4.65

$$\frac{32\sqrt{\pi}\, b^6 F^a \operatorname{erf}\left(\sqrt{-b\ln(F)}\, (dx+c)\right)\ln(F)^6}{10395\sqrt{-b\ln(F)}\, d}-\frac{32b^5 F^a F^{(dx+c)^2 b}\ln(F)^5}{10395\,(dx+c)\, d}-\frac{16b^4 F^a F^{(dx+c)^2 b}\ln(F)^4}{10395\,(dx+c)^3\, d}-\frac{8b^3 F^a F^{(dx+c)^2 b}\ln(F}{3465\,(dx+c)^5\, d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+(d*x+c)^2*b)/(d*x+c)^12,x)
```

```
[Out] -1/11/d/(d*x+c)^11*F^((d*x+c)^2*b)*F^a-2/99/d*b*ln(F)/(d*x+c)^9*F^((d*x+c)^
2*b)*F^a-4/693/d*b^2*ln(F)^2/(d*x+c)^7*F^((d*x+c)^2*b)*F^a-8/3465/d*b^3*ln(
F)^3/(d*x+c)^5*F^((d*x+c)^2*b)*F^a-16/10395/d*b^4*ln(F)^4/(d*x+c)^3*F^((d*x
+c)^2*b)*F^a-32/10395/d*b^5*ln(F)^5/(d*x+c)*F^((d*x+c)^2*b)*F^a+32/10395/d*
b^6*ln(F)^6*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*erf((-b*ln(F))^(1/2)*(d*x+c))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^2 b+a}}{(dx+c)^{12}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(d*x+c)^12,x, algorithm="maxima")
```

```
[Out] integrate(F^((d*x + c)^2*b + a)/(d*x + c)^12, x)
```

mupad [B] time = 4.15, size = 267, normalized size = 5.45

$$\frac{32\, F^a\, \sqrt{\pi}\, \left(-b\, \ln(F)\, (c+d\, x)^2\right)^{11/2}}{10395\, d\, (c+d\, x)^{11}}-\frac{F^a\, F^{b\, (c+d\, x)^2}}{11\, d\, (c+d\, x)^{11}}-\frac{4\, F^a\, F^{b\, (c+d\, x)^2}\, b^2\, \ln(F)^2}{693\, d\, (c+d\, x)^7}-\frac{8\, F^a\, F^{b\, (c+d\, x)^2}\, b^3\, \ln(F)^3}{3465\, d\, (c+d\, x)^5}-\frac{16\, F^a\, F^{b\, (c}}{10395}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)/(c + d*x)^12,x)
```

```
[Out] (32*F^a*pi^(1/2)*(-b*log(F)*(c + d*x)^2)^(11/2))/(10395*d*(c + d*x)^11) - (
F^a*F^(b*(c + d*x)^2))/(11*d*(c + d*x)^11) - (4*F^a*F^(b*(c + d*x)^2)*b^2*l
og(F)^2)/(693*d*(c + d*x)^7) - (8*F^a*F^(b*(c + d*x)^2)*b^3*log(F)^3)/(3465
*d*(c + d*x)^5) - (16*F^a*F^(b*(c + d*x)^2)*b^4*log(F)^4)/(10395*d*(c + d*x
```

```
)^3) - (32*F^a*F^(b*(c + d*x)^2)*b^5*log(F)^5)/(10395*d*(c + d*x)) - (2*F^a
*F^(b*(c + d*x)^2)*b*log(F))/(99*d*(c + d*x)^9) - (32*F^a*pi^(1/2)*erfc((-b
*log(F)*(c + d*x)^2)^(1/2))*(-b*log(F)*(c + d*x)^2)^(11/2))/(10395*d*(c + d
*x)^11)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)/(d*x+c)**12,x)
```

```
[Out] Timed out
```

3.280 $\int F^{a+b(c+dx)^3}(c+dx)^m\,dx$

Optimal. Leaf size=61

$$-\frac{F^a(c+dx)^{m+1}\left(-b\log(F)(c+dx)^3\right)^{\frac{1}{3}(-m-1)}\Gamma\left(\frac{m+1}{3},-b(c+dx)^3\log(F)\right)}{3d}$$

```
[Out] -1/3*F^a*(d*x+c)^(1+m)*GAMMA(1/3+1/3*m,-b*(d*x+c)^3*ln(F))*(-b*(d*x+c)^3*ln
(F))^(-1/3-1/3*m)/d
```

Rubi [A] time = 0.06, antiderivative size = 61, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2218}

$$-\frac{F^a(c+dx)^{m+1}\left(-b\log(F)(c+dx)^3\right)^{\frac{1}{3}(-m-1)}\text{Gamma}\left(\frac{m+1}{3},-b\log(F)(c+dx)^3\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^3)*(c + d*x)^m,x]
```

```
[Out] -(F^a*(c + d*x)^(1 + m)*Gamma[(1 + m)/3, -(b*(c + d*x)^3*Log[F])]*(-(b*(c +
 d*x)^3*Log[F]))^((-1 - m)/3))/(3*d)
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+b(c+dx)^3}(c+dx)^m\,dx=-\frac{F^a(c+dx)^{1+m}\Gamma\left(\frac{1+m}{3},-b(c+dx)^3\log(F)\right)\left(-b(c+dx)^3\log(F)\right)^{\frac{1}{3}(-1-m)}}{3d}$$

Mathematica [A] time = 0.04, size = 61, normalized size = 1.00

$$-\frac{F^a(c+dx)^{m+1}\left(-b\log(F)(c+dx)^3\right)^{\frac{1}{3}(-m-1)}\Gamma\left(\frac{m+1}{3},-b(c+dx)^3\log(F)\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^3)*(c + d*x)^m,x]
```

```
[Out] -1/3*(F^a*(c + d*x)^(1 + m)*Gamma[(1 + m)/3, -(b*(c + d*x)^3*Log[F])]*(-(b*
(c + d*x)^3*Log[F]))^((-1 - m)/3))/d
```

fricas [A] time = 0.45, size = 71, normalized size = 1.16

$$\frac{e^{\left(-\frac{1}{3}(m-2)\log\left(-b\log(F)\right)+a\log(F)\right)}\Gamma\left(\frac{1}{3}m+\frac{1}{3},-\left(bd^3x^3+3bcd^2x^2+3bc^2dx+bc^3\right)\log(F)\right)}{3bd\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c)^m,x, algorithm="fricas")
```

```
[Out] 1/3*e^(-1/3*(m - 2)*log(-b*log(F)) + a*log(F))*gamma(1/3*m + 1/3, -(b*d^3*x
^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3)*log(F))/(b*d*log(F))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)^m F^{(dx+c)^3b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c)^m,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^m*F^((d*x + c)^3*b + a), x)
```

maple [F] time = 0.10, size = 0, normalized size = 0.00

$$\int F^{a+(dx+c)^3b}(dx+c)^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^3)*(d*x+c)^m,x)
```

```
[Out] int(F^(a+b*(d*x+c)^3)*(d*x+c)^m,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)^m F^{(dx+c)^3b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c)^m,x, algorithm="maxima")
```

```
[Out] integrate((d*x + c)^m*F^((d*x + c)^3*b + a), x)
```

mupad [B] time = 3.68, size = 75, normalized size = 1.23

$$\frac{F^a\,e^{\frac{b\,\ln(F)\,(c+d\,x)^3}{2}}\,(c+d\,x)^{m+1}\,\mathrm{M}_{\frac{1}{3}-\frac{m}{6},\frac{m}{6}+\frac{1}{6}}\left(b\,\ln(F)\,(c+d\,x)^3\right)}{d\,(m+1)\,\left(b\,\ln(F)\,(c+d\,x)^3\right)^{\frac{m}{6}+\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^3)*(c + d*x)^m,x)
```

```
[Out] (F^a*exp((b*log(F)*(c + d*x)^3)/2)*(c + d*x)^(m + 1)*whittakerM(1/3 - m/6,
m/6 + 1/6, b*log(F)*(c + d*x)^3))/(d*(m + 1)*(b*log(F)*(c + d*x)^3)^(m/6 +
2/3))
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**3)*(d*x+c)**m,x)
```

```
[Out] Timed out
```

3.281 $\int F^{a+b(c+dx)^3}(c+dx)^{17}\,dx$

Optimal. Leaf size=105

$$-\frac{F^{a+b(c+dx)^3}\left(-b^5\log^5(F)(c+dx)^{15}+5b^4\log^4(F)(c+dx)^{12}-20b^3\log^3(F)(c+dx)^9+60b^2\log^2(F)(c+dx)^6-120\right.}{3b^6d\log^6(F)}$$

```
[Out] -1/3*F^(a+b*(d*x+c)^3)*(120-120*b*(d*x+c)^3*ln(F)+60*b^2*(d*x+c)^6*ln(F)^2-
20*b^3*(d*x+c)^9*ln(F)^3+5*b^4*(d*x+c)^12*ln(F)^4-b^5*(d*x+c)^15*ln(F)^5)/b
^6/d/ln(F)^6
```

Rubi [C] time = 0.07, antiderivative size = 31, normalized size of antiderivative = 0.30, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2218}

$$-\frac{F^a\text{Gamma}\left(6,-b\log(F)(c+dx)^3\right)}{3b^6d\log^6(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^3)*(c + d*x)^17,x]
```

```
[Out] -(F^a*Gamma[6, -(b*(c + d*x)^3*Log[F])])/(3*b^6*d*Log[F]^6)
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+b(c+dx)^3}(c+dx)^{17}\,dx=-\frac{F^a\Gamma\left(6,-b(c+dx)^3\log(F)\right)}{3b^6d\log^6(F)}$$

Mathematica [C] time = 0.01, size = 31, normalized size = 0.30

$$-\frac{F^a\Gamma\left(6,-b(c+dx)^3\log(F)\right)}{3b^6d\log^6(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^3)*(c + d*x)^17,x]
```

```
[Out] -1/3*(F^a*Gamma[6, -(b*(c + d*x)^3*Log[F])])/(b^6*d*Log[F]^6)
```

fricas [B] time = 0.44, size = 688, normalized size = 6.55

$$\frac{\left(\left(b^5 d^{15} x^{15} + 15\, b^5 c d^{14} x^{14} + 105\, b^5 c^2 d^{13} x^{13} + 455\, b^5 c^3 d^{12} x^{12} + 1365\, b^5 c^4 d^{11} x^{11} + 3003\, b^5 c^5 d^{10} x^{10} + 5005\, b^5 c^6 d\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c)^17,x, algorithm="fricas")
```

```
[Out] 1/3*((b^5*d^15*x^15 + 15*b^5*c*d^14*x^14 + 105*b^5*c^2*d^13*x^13 + 455*b^5*
c^3*d^12*x^12 + 1365*b^5*c^4*d^11*x^11 + 3003*b^5*c^5*d^10*x^10 + 5005*b^5*
c^6*d^9*x^9 + 6435*b^5*c^7*d^8*x^8 + 6435*b^5*c^8*d^7*x^7 + 5005*b^5*c^9*d^
6*x^6 + 3003*b^5*c^10*d^5*x^5 + 1365*b^5*c^11*d^4*x^4 + 455*b^5*c^12*d^3*x^
3 + 105*b^5*c^13*d^2*x^2 + 15*b^5*c^14*d*x + b^5*c^15)*log(F)^5 - 5*(b^4*d^
12*x^12 + 12*b^4*c*d^11*x^11 + 66*b^4*c^2*d^10*x^10 + 220*b^4*c^3*d^9*x^9 +
 495*b^4*c^4*d^8*x^8 + 792*b^4*c^5*d^7*x^7 + 924*b^4*c^6*d^6*x^6 + 792*b^4*
c^7*d^5*x^5 + 495*b^4*c^8*d^4*x^4 + 220*b^4*c^9*d^3*x^3 + 66*b^4*c^10*d^2*x
^2 + 12*b^4*c^11*d*x + b^4*c^12)*log(F)^4 + 20*(b^3*d^9*x^9 + 9*b^3*c*d^8*x
^8 + 36*b^3*c^2*d^7*x^7 + 84*b^3*c^3*d^6*x^6 + 126*b^3*c^4*d^5*x^5 + 126*b^
3*c^5*d^4*x^4 + 84*b^3*c^6*d^3*x^3 + 36*b^3*c^7*d^2*x^2 + 9*b^3*c^8*d*x + b
^3*c^9)*log(F)^3 - 60*(b^2*d^6*x^6 + 6*b^2*c*d^5*x^5 + 15*b^2*c^2*d^4*x^4 +
 20*b^2*c^3*d^3*x^3 + 15*b^2*c^4*d^2*x^2 + 6*b^2*c^5*d*x + b^2*c^6)*log(F)^
2 + 120*(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3)*log(F) - 120)*F^(
b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a)/(b^6*d*log(F)^6)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c)^17,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:Polynomial exponent overflow. Error: Bad Arg
ument Value
```

maple [B] time = 0.02, size = 857, normalized size = 8.16

$$\frac{\left(b^5 d^{15} x^{15} \ln(F)^5 + 15 b^5 c\, d^{14} x^{14} \ln(F)^5 + 105 b^5 c^2 d^{13} x^{13} \ln(F)^5 + 455 b^5 c^3 d^{12} x^{12} \ln(F)^5 + 1365 b^5 c^4 d^{11} x^{11} \ln(F)^5 \right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+(d*x+c)^3*b)*(d*x+c)^17,x)
```

```
[Out] 1/3*(-120+120*ln(F)*b*c^3+360*ln(F)*b*c*d^2*x^2+360*ln(F)*b*c^2*d*x+120*ln(
F)*b*d^3*x^3+20*ln(F)^3*b^3*c^9+d^15*x^15*ln(F)^5*b^5-5*d^12*x^12*ln(F)^4*b
^4+20*d^9*x^9*ln(F)^3*b^3-60*d^6*x^6*ln(F)^2*b^2-60*ln(F)^2*b^2*c^6-5*ln(F)
^4*b^4*c^12+ln(F)^5*b^5*c^15-4620*ln(F)^4*b^4*c^6*d^6*x^6-3960*ln(F)^4*b^4*
c^7*d^5*x^5-2475*ln(F)^4*b^4*c^8*d^4*x^4-1100*ln(F)^4*b^4*c^9*d^3*x^3+180*c
*d^8*x^8*ln(F)^3*b^3-330*ln(F)^4*b^4*c^10*d^2*x^2+720*c^2*d^7*x^7*ln(F)^3*b
^3-60*ln(F)^4*b^4*c^11*d*x+1680*ln(F)^3*b^3*c^3*d^6*x^6+2520*ln(F)^3*b^3*c^
4*d^5*x^5+2520*ln(F)^3*b^3*c^5*d^4*x^4+1680*ln(F)^3*b^3*c^6*d^3*x^3+720*ln(
F)^3*b^3*c^7*d^2*x^2+180*ln(F)^3*b^3*c^8*d*x-360*c*d^5*x^5*ln(F)^2*b^2-900*
c^2*d^4*x^4*ln(F)^2*b^2-1200*ln(F)^2*b^2*c^3*d^3*x^3-900*ln(F)^2*b^2*c^4*d^
2*x^2-360*ln(F)^2*b^2*c^5*d*x+15*ln(F)^5*b^5*c^14*d*x+455*ln(F)^5*b^5*c^3*d
^12*x^12+1365*ln(F)^5*b^5*c^4*d^11*x^11+3003*ln(F)^5*b^5*c^5*d^10*x^10+5005
*ln(F)^5*b^5*c^6*d^9*x^9+6435*ln(F)^5*b^5*c^7*d^8*x^8+6435*ln(F)^5*b^5*c^8*
d^7*x^7+5005*ln(F)^5*b^5*c^9*d^6*x^6-60*c*d^11*x^11*ln(F)^4*b^4+3003*ln(F)^
5*b^5*c^10*d^5*x^5-330*c^2*d^10*x^10*ln(F)^4*b^4+1365*ln(F)^5*b^5*c^11*d^4*
x^4-1100*ln(F)^4*b^4*c^3*d^9*x^9+455*ln(F)^5*b^5*c^12*d^3*x^3-2475*ln(F)^4*
b^4*c^4*d^8*x^8+105*ln(F)^5*b^5*c^13*d^2*x^2-3960*ln(F)^4*b^4*c^5*d^7*x^7+1
5*d^14*c*x^14*ln(F)^5*b^5+105*d^13*c^2*x^13*ln(F)^5*b^5)*F^(b*d^3*x^3+3*b*c
*d^2*x^2+3*b*c^2*d*x+b*c^3+a)/d/ln(F)^6/b^6
```

maxima [B] time = 2.36, size = 1268, normalized size = 12.08

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c)^17,x, algorithm="maxima")
```

```
[Out] 1/3*(F^(b*c^3 + a)*b^5*d^15*x^15*log(F)^5 + 15*F^(b*c^3 + a)*b^5*c*d^14*x^1
4*log(F)^5 + 105*F^(b*c^3 + a)*b^5*c^2*d^13*x^13*log(F)^5 + F^(b*c^3 + a)*b
^5*c^15*log(F)^5 - 5*F^(b*c^3 + a)*b^4*c^12*log(F)^4 + 20*F^(b*c^3 + a)*b^3
*c^9*log(F)^3 + 5*(91*F^(b*c^3 + a)*b^5*c^3*d^12*log(F)^5 - F^(b*c^3 + a)*b
^4*d^12*log(F)^4)*x^12 + 15*(91*F^(b*c^3 + a)*b^5*c^4*d^11*log(F)^5 - 4*F^(
b*c^3 + a)*b^4*c*d^11*log(F)^4)*x^11 + 33*(91*F^(b*c^3 + a)*b^5*c^5*d^10*lo
g(F)^5 - 10*F^(b*c^3 + a)*b^4*c^2*d^10*log(F)^4)*x^10 - 60*F^(b*c^3 + a)*b^
2*c^6*log(F)^2 + 5*(1001*F^(b*c^3 + a)*b^5*c^6*d^9*log(F)^5 - 220*F^(b*c^3
+ a)*b^4*c^3*d^9*log(F)^4 + 4*F^(b*c^3 + a)*b^3*d^9*log(F)^3)*x^9 + 45*(143
*F^(b*c^3 + a)*b^5*c^7*d^8*log(F)^5 - 55*F^(b*c^3 + a)*b^4*c^4*d^8*log(F)^4
 + 4*F^(b*c^3 + a)*b^3*c*d^8*log(F)^3)*x^8 + 45*(143*F^(b*c^3 + a)*b^5*c^8*
d^7*log(F)^5 - 88*F^(b*c^3 + a)*b^4*c^5*d^7*log(F)^4 + 16*F^(b*c^3 + a)*b^3
*c^2*d^7*log(F)^3)*x^7 + 5*(1001*F^(b*c^3 + a)*b^5*c^9*d^6*log(F)^5 - 924*F
^(b*c^3 + a)*b^4*c^6*d^6*log(F)^4 + 336*F^(b*c^3 + a)*b^3*c^3*d^6*log(F)^3
```

```
- 12*F^(b*c^3 + a)*b^2*d^6*log(F)^2)*x^6 + 3*(1001*F^(b*c^3 + a)*b^5*c^10*d
^5*log(F)^5 - 1320*F^(b*c^3 + a)*b^4*c^7*d^5*log(F)^4 + 840*F^(b*c^3 + a)*b
^3*c^4*d^5*log(F)^3 - 120*F^(b*c^3 + a)*b^2*c*d^5*log(F)^2)*x^5 + 120*F^(b*
c^3 + a)*b*c^3*log(F) + 15*(91*F^(b*c^3 + a)*b^5*c^11*d^4*log(F)^5 - 165*F^
(b*c^3 + a)*b^4*c^8*d^4*log(F)^4 + 168*F^(b*c^3 + a)*b^3*c^5*d^4*log(F)^3 -
 60*F^(b*c^3 + a)*b^2*c^2*d^4*log(F)^2)*x^4 + 5*(91*F^(b*c^3 + a)*b^5*c^12*
d^3*log(F)^5 - 220*F^(b*c^3 + a)*b^4*c^9*d^3*log(F)^4 + 336*F^(b*c^3 + a)*b
^3*c^6*d^3*log(F)^3 - 240*F^(b*c^3 + a)*b^2*c^3*d^3*log(F)^2 + 24*F^(b*c^3
+ a)*b*d^3*log(F))*x^3 + 15*(7*F^(b*c^3 + a)*b^5*c^13*d^2*log(F)^5 - 22*F^(
b*c^3 + a)*b^4*c^10*d^2*log(F)^4 + 48*F^(b*c^3 + a)*b^3*c^7*d^2*log(F)^3 -
60*F^(b*c^3 + a)*b^2*c^4*d^2*log(F)^2 + 24*F^(b*c^3 + a)*b*c*d^2*log(F))*x^
2 + 15*(F^(b*c^3 + a)*b^5*c^14*d*log(F)^5 - 4*F^(b*c^3 + a)*b^4*c^11*d*log(
F)^4 + 12*F^(b*c^3 + a)*b^3*c^8*d*log(F)^3 - 24*F^(b*c^3 + a)*b^2*c^5*d*log
(F)^2 + 24*F^(b*c^3 + a)*b*c^2*d*log(F))*x - 120*F^(b*c^3 + a))*e^(b*d^3*x^
3*log(F) + 3*b*c*d^2*x^2*log(F) + 3*b*c^2*d*x*log(F))/(b^6*d*log(F)^6)
```

mupad [B] time = 4.37, size = 685, normalized size = 6.52

$$F^{b\,d^3\,x^3}\,F^{3\,b\,c^2\,d\,x}\,F^a\,F^{b\,c^3}\,F^{3\,b\,c\,d^2\,x^2}\,\left(\frac{b^5\,c^{15}\,\ln(F)^5-5\,b^4\,c^{12}\,\ln(F)^4+20\,b^3\,c^9\,\ln(F)^3-60\,b^2\,c^6\,\ln(F)^2+120\,b\,c^3\,\ln(F}{3\,b^6\,d\,\ln(F)^6}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^3)*(c + d*x)^17,x)
```

```
[Out] F^(b*d^3*x^3)*F^(3*b*c^2*d*x)*F^a*F^(b*c^3)*F^(3*b*c*d^2*x^2)*((120*b*c^3*l
og(F) - 60*b^2*c^6*log(F)^2 + 20*b^3*c^9*log(F)^3 - 5*b^4*c^12*log(F)^4 + b
^5*c^15*log(F)^5 - 120)/(3*b^6*d*log(F)^6) + (d^14*x^15)/(3*b*log(F)) + (5*
c*d^13*x^14)/(b*log(F)) + (5*d^2*x^3*(336*b^2*c^6*log(F)^2 - 240*b*c^3*log(
F) - 220*b^3*c^9*log(F)^3 + 91*b^4*c^12*log(F)^4 + 24))/(3*b^5*log(F)^5) +
(5*d^5*x^6*(336*b*c^3*log(F) - 924*b^2*c^6*log(F)^2 + 1001*b^3*c^9*log(F)^3
 - 12))/(3*b^4*log(F)^4) + (5*d^8*x^9*(1001*b^2*c^6*log(F)^2 - 220*b*c^3*lo
g(F) + 4))/(3*b^3*log(F)^3) + (5*d^11*x^12*(91*b*c^3*log(F) - 1))/(3*b^2*lo
g(F)^2) + (35*c^2*d^12*x^13)/(b*log(F)) + (5*c^2*x*(12*b^2*c^6*log(F)^2 - 2
4*b*c^3*log(F) - 4*b^3*c^9*log(F)^3 + b^4*c^12*log(F)^4 + 24))/(b^5*log(F)^
5) + (5*c^2*d^3*x^4*(168*b*c^3*log(F) - 165*b^2*c^6*log(F)^2 + 91*b^3*c^9*l
og(F)^3 - 60))/(b^4*log(F)^4) + (15*c^2*d^6*x^7*(143*b^2*c^6*log(F)^2 - 88*
b*c^3*log(F) + 16))/(b^3*log(F)^3) + (11*c^2*d^9*x^10*(91*b*c^3*log(F) - 10
))/(b^2*log(F)^2) + (5*c*d*x^2*(48*b^2*c^6*log(F)^2 - 60*b*c^3*log(F) - 22*
b^3*c^9*log(F)^3 + 7*b^4*c^12*log(F)^4 + 24))/(b^5*log(F)^5) + (c*d^4*x^5*(
840*b*c^3*log(F) - 1320*b^2*c^6*log(F)^2 + 1001*b^3*c^9*log(F)^3 - 120))/(b
^4*log(F)^4) + (15*c*d^7*x^8*(143*b^2*c^6*log(F)^2 - 55*b*c^3*log(F) + 4))/
(b^3*log(F)^3) + (5*c*d^10*x^11*(91*b*c^3*log(F) - 4))/(b^2*log(F)^2))
```

sympy [A] time = 0.79, size = 1171, normalized size = 11.15

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**3)*(d*x+c)**17,x)
```

```
[Out] Piecewise((F**(a + b*(c + d*x)**3)*(b**5*c**15*log(F)**5 + 15*b**5*c**14*d*
x*log(F)**5 + 105*b**5*c**13*d**2*x**2*log(F)**5 + 455*b**5*c**12*d**3*x**3
*log(F)**5 + 1365*b**5*c**11*d**4*x**4*log(F)**5 + 3003*b**5*c**10*d**5*x**
5*log(F)**5 + 5005*b**5*c**9*d**6*x**6*log(F)**5 + 6435*b**5*c**8*d**7*x**7
*log(F)**5 + 6435*b**5*c**7*d**8*x**8*log(F)**5 + 5005*b**5*c**6*d**9*x**9*
log(F)**5 + 3003*b**5*c**5*d**10*x**10*log(F)**5 + 1365*b**5*c**4*d**11*x**
11*log(F)**5 + 455*b**5*c**3*d**12*x**12*log(F)**5 + 105*b**5*c**2*d**13*x*
*13*log(F)**5 + 15*b**5*c*d**14*x**14*log(F)**5 + b**5*d**15*x**15*log(F)**
5 - 5*b**4*c**12*log(F)**4 - 60*b**4*c**11*d*x*log(F)**4 - 330*b**4*c**10*d
**2*x**2*log(F)**4 - 1100*b**4*c**9*d**3*x**3*log(F)**4 - 2475*b**4*c**8*d*
*4*x**4*log(F)**4 - 3960*b**4*c**7*d**5*x**5*log(F)**4 - 4620*b**4*c**6*d**
6*x**6*log(F)**4 - 3960*b**4*c**5*d**7*x**7*log(F)**4 - 2475*b**4*c**4*d**8
*x**8*log(F)**4 - 1100*b**4*c**3*d**9*x**9*log(F)**4 - 330*b**4*c**2*d**10*
x**10*log(F)**4 - 60*b**4*c*d**11*x**11*log(F)**4 - 5*b**4*d**12*x**12*log(
F)**4 + 20*b**3*c**9*log(F)**3 + 180*b**3*c**8*d*x*log(F)**3 + 720*b**3*c**
7*d**2*x**2*log(F)**3 + 1680*b**3*c**6*d**3*x**3*log(F)**3 + 2520*b**3*c**5
*d**4*x**4*log(F)**3 + 2520*b**3*c**4*d**5*x**5*log(F)**3 + 1680*b**3*c**3*
d**6*x**6*log(F)**3 + 720*b**3*c**2*d**7*x**7*log(F)**3 + 180*b**3*c*d**8*x
**8*log(F)**3 + 20*b**3*d**9*x**9*log(F)**3 - 60*b**2*c**6*log(F)**2 - 360*
b**2*c**5*d*x*log(F)**2 - 900*b**2*c**4*d**2*x**2*log(F)**2 - 1200*b**2*c**
3*d**3*x**3*log(F)**2 - 900*b**2*c**2*d**4*x**4*log(F)**2 - 360*b**2*c*d**5
*x**5*log(F)**2 - 60*b**2*d**6*x**6*log(F)**2 + 120*b*c**3*log(F) + 360*b*c
**2*d*x*log(F) + 360*b*c*d**2*x**2*log(F) + 120*b*d**3*x**3*log(F) - 120)/(
3*b**6*d*log(F)**6), Ne(3*b**6*d*log(F)**6, 0)), (c**17*x + 17*c**16*d*x**2
/2 + 136*c**15*d**2*x**3/3 + 170*c**14*d**3*x**4 + 476*c**13*d**4*x**5 + 30
94*c**12*d**5*x**6/3 + 1768*c**11*d**6*x**7 + 2431*c**10*d**7*x**8 + 24310*
c**9*d**8*x**9/9 + 2431*c**8*d**9*x**10 + 1768*c**7*d**10*x**11 + 3094*c**6
*d**11*x**12/3 + 476*c**5*d**12*x**13 + 170*c**4*d**13*x**14 + 136*c**3*d**
14*x**15/3 + 17*c**2*d**15*x**16/2 + c*d**16*x**17 + d**17*x**18/18, True))
```

3.282 $\int F^{a+b(c+dx)^3}(c+dx)^{14}\,dx$

Optimal. Leaf size=88

$$\frac{F^{a+b(c+dx)^3}\left(b^4\log^4(F)(c+dx)^{12}-4b^3\log^3(F)(c+dx)^9+12b^2\log^2(F)(c+dx)^6-24b\log(F)(c+dx)^3+24\right)}{3b^5d\log^5(F)}$$

```
[Out] 1/3*F^(a+b*(d*x+c)^3)*(24-24*b*(d*x+c)^3*ln(F)+12*b^2*(d*x+c)^6*ln(F)^2-4*b
^3*(d*x+c)^9*ln(F)^3+b^4*(d*x+c)^12*ln(F)^4)/b^5/d/ln(F)^5
```

Rubi [C] time = 0.07, antiderivative size = 31, normalized size of antiderivative = 0.35, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2218}

$$\frac{F^a\text{Gamma}\left(5,-b\log(F)(c+dx)^3\right)}{3b^5d\log^5(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^3)*(c + d*x)^14,x]
```

```
[Out] (F^a*Gamma[5, -(b*(c + d*x)^3*Log[F])])/(3*b^5*d*Log[F]^5)
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+b(c+dx)^3}(c+dx)^{14}\,dx=\frac{F^a\Gamma\left(5,-b(c+dx)^3\log(F)\right)}{3b^5d\log^5(F)}$$

Mathematica [C] time = 0.01, size = 31, normalized size = 0.35

$$\frac{F^a\Gamma\left(5,-b(c+dx)^3\log(F)\right)}{3b^5d\log^5(F)}$$

Antiderivative was successfully verified.

[In] Integrate[F^(a + b*(c + d*x)^3)*(c + d*x)^14,x]

[Out] (F^a*Gamma[5, -(b*(c + d*x)^3*Log[F])])/(3*b^5*d*Log[F]^5)

fricas [B] time = 0.45, size = 474, normalized size = 5.39

$$\left(\left(b^4d^{12}x^{12}+12\,b^4cd^{11}x^{11}+66\,b^4c^2d^{10}x^{10}+220\,b^4c^3d^9x^9+495\,b^4c^4d^8x^8+792\,b^4c^5d^7x^7+924\,b^4c^6d^6x^6+792\,b\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c)^14,x, algorithm="fricas")

[Out] 1/3*((b^4*d^12*x^12 + 12*b^4*c*d^11*x^11 + 66*b^4*c^2*d^10*x^10 + 220*b^4*c^3*d^9*x^9 + 495*b^4*c^4*d^8*x^8 + 792*b^4*c^5*d^7*x^7 + 924*b^4*c^6*d^6*x^6 + 792*b^4*c^7*d^5*x^5 + 495*b^4*c^8*d^4*x^4 + 220*b^4*c^9*d^3*x^3 + 66*b^4*c^10*d^2*x^2 + 12*b^4*c^11*d*x + b^4*c^12)*log(F)^4 - 4*(b^3*d^9*x^9 + 9*b^3*c*d^8*x^8 + 36*b^3*c^2*d^7*x^7 + 84*b^3*c^3*d^6*x^6 + 126*b^3*c^4*d^5*x^5 + 126*b^3*c^5*d^4*x^4 + 84*b^3*c^6*d^3*x^3 + 36*b^3*c^7*d^2*x^2 + 9*b^3*c^8*d*x + b^3*c^9)*log(F)^3 + 12*(b^2*d^6*x^6 + 6*b^2*c*d^5*x^5 + 15*b^2*c^2*d^4*x^4 + 20*b^2*c^3*d^3*x^3 + 15*b^2*c^4*d^2*x^2 + 6*b^2*c^5*d*x + b^2*c^6)*log(F)^2 - 24*(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3)*log(F) + 24)*F^(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a)/(b^5*d*log(F)^5)

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c)^14,x, algorithm="giac")

[Out] Exception raised: TypeError >> An error occurred running a Giac command:INPUT:sage2:=int(sage0,x):;OUTPUT:Polynomial exponent overflow. Error: Bad Argument Value

maple [B] time = 0.02, size = 584, normalized size = 6.64

$$\left(b^4d^{12}x^{12}\ln(F)^4+12b^4c\,d^{11}x^{11}\ln(F)^4+66b^4c^2d^{10}x^{10}\ln(F)^4+220b^4c^3d^9x^9\ln(F)^4+495b^4c^4d^8x^8\ln(F)^4+792b^4\right.$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(F^(a+(d*x+c)^3*b)*(d*x+c)^14,x)

[Out] 1/3*(24-24*b*c^3*ln(F)-72*b*c*d^2*x^2*ln(F)-72*b*c^2*d*x*ln(F)-24*b*d^3*x^3*ln(F)-4*b^3*c^9*ln(F)^3+b^4*d^12*x^12*ln(F)^4-4*b^3*d^9*x^9*ln(F)^3+12*b^2

```
*d^6*x^6*ln(F)^2+12*b^2*c^6*ln(F)^2+b^4*c^12*ln(F)^4+924*b^4*c^6*d^6*x^6*ln
(F)^4+792*b^4*c^7*d^5*x^5*ln(F)^4+495*b^4*c^8*d^4*x^4*ln(F)^4+220*b^4*c^9*d
^3*x^3*ln(F)^4-36*b^3*c*d^8*x^8*ln(F)^3+66*b^4*c^10*d^2*x^2*ln(F)^4-144*b^3
*c^2*d^7*x^7*ln(F)^3+12*b^4*c^11*d*x*ln(F)^4-336*b^3*c^3*d^6*x^6*ln(F)^3-50
4*b^3*c^4*d^5*x^5*ln(F)^3-504*b^3*c^5*d^4*x^4*ln(F)^3-336*b^3*c^6*d^3*x^3*l
n(F)^3-144*b^3*c^7*d^2*x^2*ln(F)^3-36*b^3*c^8*d*x*ln(F)^3+72*b^2*c*d^5*x^5*
ln(F)^2+180*b^2*c^2*d^4*x^4*ln(F)^2+240*b^2*c^3*d^3*x^3*ln(F)^2+180*b^2*c^4
*d^2*x^2*ln(F)^2+72*b^2*c^5*d*x*ln(F)^2+12*b^4*c*d^11*x^11*ln(F)^4+66*b^4*c
^2*d^10*x^10*ln(F)^4+220*b^4*c^3*d^9*x^9*ln(F)^4+495*b^4*c^4*d^8*x^8*ln(F)^
4+792*b^4*c^5*d^7*x^7*ln(F)^4)*F^(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3
+a)/d/ln(F)^5/b^5
```

maxima [**B**] time = 2.29, size = 874, normalized size = 9.93

$$\frac{\left(F^{bc^3+a}b^4d^{12}x^{12}\log(F)^4 + 12\,F^{bc^3+a}b^4cd^{11}x^{11}\log(F)^4 + 66\,F^{bc^3+a}b^4c^2d^{10}x^{10}\log(F)^4 + F^{bc^3+a}b^4c^{12}\log(F)^4 - 4\,F^{b}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c)^14,x, algorithm="maxima")
```

```
[Out] 1/3*(F^(b*c^3 + a)*b^4*d^12*x^12*log(F)^4 + 12*F^(b*c^3 + a)*b^4*c*d^11*x^1
1*log(F)^4 + 66*F^(b*c^3 + a)*b^4*c^2*d^10*x^10*log(F)^4 + F^(b*c^3 + a)*b^
4*c^12*log(F)^4 - 4*F^(b*c^3 + a)*b^3*c^9*log(F)^3 + 12*F^(b*c^3 + a)*b^2*c
^6*log(F)^2 + 4*(55*F^(b*c^3 + a)*b^4*c^3*d^9*log(F)^4 - F^(b*c^3 + a)*b^3*
d^9*log(F)^3)*x^9 + 9*(55*F^(b*c^3 + a)*b^4*c^4*d^8*log(F)^4 - 4*F^(b*c^3 +
 a)*b^3*c*d^8*log(F)^3)*x^8 + 72*(11*F^(b*c^3 + a)*b^4*c^5*d^7*log(F)^4 - 2
*F^(b*c^3 + a)*b^3*c^2*d^7*log(F)^3)*x^7 + 12*(77*F^(b*c^3 + a)*b^4*c^6*d^6
*log(F)^4 - 28*F^(b*c^3 + a)*b^3*c^3*d^6*log(F)^3 + F^(b*c^3 + a)*b^2*d^6*l
og(F)^2)*x^6 + 72*(11*F^(b*c^3 + a)*b^4*c^7*d^5*log(F)^4 - 7*F^(b*c^3 + a)*
b^3*c^4*d^5*log(F)^3 + F^(b*c^3 + a)*b^2*c*d^5*log(F)^2)*x^5 - 24*F^(b*c^3
+ a)*b*c^3*log(F) + 9*(55*F^(b*c^3 + a)*b^4*c^8*d^4*log(F)^4 - 56*F^(b*c^3
+ a)*b^3*c^5*d^4*log(F)^3 + 20*F^(b*c^3 + a)*b^2*c^2*d^4*log(F)^2)*x^4 + 4*
(55*F^(b*c^3 + a)*b^4*c^9*d^3*log(F)^4 - 84*F^(b*c^3 + a)*b^3*c^6*d^3*log(F
)^3 + 60*F^(b*c^3 + a)*b^2*c^3*d^3*log(F)^2 - 6*F^(b*c^3 + a)*b*d^3*log(F))
*x^3 + 6*(11*F^(b*c^3 + a)*b^4*c^10*d^2*log(F)^4 - 24*F^(b*c^3 + a)*b^3*c^7
*d^2*log(F)^3 + 30*F^(b*c^3 + a)*b^2*c^4*d^2*log(F)^2 - 12*F^(b*c^3 + a)*b*
c*d^2*log(F))*x^2 + 12*(F^(b*c^3 + a)*b^4*c^11*d*log(F)^4 - 3*F^(b*c^3 + a)
*b^3*c^8*d*log(F)^3 + 6*F^(b*c^3 + a)*b^2*c^5*d*log(F)^2 - 6*F^(b*c^3 + a)*
b*c^2*d*log(F))*x + 24*F^(b*c^3 + a))*e^(b*d^3*x^3*log(F) + 3*b*c*d^2*x^2*l
og(F) + 3*b*c^2*d*x*log(F))/(b^5*d*log(F)^5)
```

mupad [**B**] time = 4.08, size = 487, normalized size = 5.53

$$F^{b\,d^3\,x^3}\,F^{3\,b\,c^2\,d\,x}\,F^a\,F^{b\,c^3}\,F^{3\,b\,c\,d^2\,x^2}\left(\frac{b^4\,c^{12}\,\ln(F)^4 - 4\,b^3\,c^9\,\ln(F)^3 + 12\,b^2\,c^6\,\ln(F)^2 - 24\,b\,c^3\,\ln(F) + 24}{3\,b^5\,d\,\ln(F)^5} + \frac{d^{11}\,x^{12}}{3\,b\,\ln(F)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^3)*(c + d*x)^14,x)
```

```
[Out] F^(b*d^3*x^3)*F^(3*b*c^2*d*x)*F^a*F^(b*c^3)*F^(3*b*c*d^2*x^2)*((12*b^2*c^6*
log(F)^2 - 24*b*c^3*log(F) - 4*b^3*c^9*log(F)^3 + b^4*c^12*log(F)^4 + 24)/(
3*b^5*d*log(F)^5) + (d^11*x^12)/(3*b*log(F)) + (4*c*d^10*x^11)/(b*log(F)) +
 (4*d^2*x^3*(60*b*c^3*log(F) - 84*b^2*c^6*log(F)^2 + 55*b^3*c^9*log(F)^3 -
6))/(3*b^4*log(F)^4) + (4*d^5*x^6*(77*b^2*c^6*log(F)^2 - 28*b*c^3*log(F) +
1))/(b^3*log(F)^3) + (4*d^8*x^9*(55*b*c^3*log(F) - 1))/(3*b^2*log(F)^2) + (
22*c^2*d^9*x^10)/(b*log(F)) + (4*c^2*x*(6*b*c^3*log(F) - 3*b^2*c^6*log(F)^2
 + b^3*c^9*log(F)^3 - 6))/(b^4*log(F)^4) + (3*c^2*d^3*x^4*(55*b^2*c^6*log(F
)^2 - 56*b*c^3*log(F) + 20))/(b^3*log(F)^3) + (24*c^2*d^6*x^7*(11*b*c^3*log
(F) - 2))/(b^2*log(F)^2) + (2*c*d*x^2*(30*b*c^3*log(F) - 24*b^2*c^6*log(F)^
2 + 11*b^3*c^9*log(F)^3 - 12))/(b^4*log(F)^4) + (24*c*d^4*x^5*(11*b^2*c^6*l
og(F)^2 - 7*b*c^3*log(F) + 1))/(b^3*log(F)^3) + (3*c*d^7*x^8*(55*b*c^3*log(
F) - 4))/(b^2*log(F)^2))
```

sympy [A] time = 0.61, size = 823, normalized size = 9.35

$$\begin{cases} \frac{F^{a+b(c+dx)^3}\left(b^4c^{12}\log(F)^4+12b^4c^{11}dx\log(F)^4+66b^4c^{10}d^2x^2\log(F)^4+220b^4c^9d^3x^3\log(F)^4+495b^4c^8d^4x^4\log(F)^4+792b^4c^7d^5x^5\log(F)^4+924b^4c^6d^6x\right.}{} \\ c^{14}x+7c^{13}dx^2+\frac{91c^{12}d^2x^3}{3}+91c^{11}d^3x^4+\frac{1001c^{10}d^4x^5}{5}+\frac{1001c^9d^5x^6}{3}+429c^8d^6x^7+429c^7d^7x^8+\frac{1001c^6d^8x^9}{3}+\frac{1001c^5d^9x}{5} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**3)*(d*x+c)**14,x)
```

```
[Out] Piecewise((F**(a + b*(c + d*x)**3)*(b**4*c**12*log(F)**4 + 12*b**4*c**11*d*
x*log(F)**4 + 66*b**4*c**10*d**2*x**2*log(F)**4 + 220*b**4*c**9*d**3*x**3*l
og(F)**4 + 495*b**4*c**8*d**4*x**4*log(F)**4 + 792*b**4*c**7*d**5*x**5*log(
F)**4 + 924*b**4*c**6*d**6*x**6*log(F)**4 + 792*b**4*c**5*d**7*x**7*log(F)*
*4 + 495*b**4*c**4*d**8*x**8*log(F)**4 + 220*b**4*c**3*d**9*x**9*log(F)**4
+ 66*b**4*c**2*d**10*x**10*log(F)**4 + 12*b**4*c*d**11*x**11*log(F)**4 + b*
*4*d**12*x**12*log(F)**4 - 4*b**3*c**9*log(F)**3 - 36*b**3*c**8*d*x*log(F)*
*3 - 144*b**3*c**7*d**2*x**2*log(F)**3 - 336*b**3*c**6*d**3*x**3*log(F)**3
- 504*b**3*c**5*d**4*x**4*log(F)**3 - 504*b**3*c**4*d**5*x**5*log(F)**3 - 3
36*b**3*c**3*d**6*x**6*log(F)**3 - 144*b**3*c**2*d**7*x**7*log(F)**3 - 36*b
**3*c*d**8*x**8*log(F)**3 - 4*b**3*d**9*x**9*log(F)**3 + 12*b**2*c**6*log(F
)**2 + 72*b**2*c**5*d*x*log(F)**2 + 180*b**2*c**4*d**2*x**2*log(F)**2 + 240
*b**2*c**3*d**3*x**3*log(F)**2 + 180*b**2*c**2*d**4*x**4*log(F)**2 + 72*b**
2*c*d**5*x**5*log(F)**2 + 12*b**2*d**6*x**6*log(F)**2 - 24*b*c**3*log(F) -
72*b*c**2*d*x*log(F) - 72*b*c*d**2*x**2*log(F) - 24*b*d**3*x**3*log(F) + 24
)/(3*b**5*d*log(F)**5), Ne(3*b**5*d*log(F)**5, 0)), (c**14*x + 7*c**13*d*x*
```

```
*2 + 91*c**12*d**2*x**3/3 + 91*c**11*d**3*x**4 + 1001*c**10*d**4*x**5/5 + 1
001*c**9*d**5*x**6/3 + 429*c**8*d**6*x**7 + 429*c**7*d**7*x**8 + 1001*c**6*
d**8*x**9/3 + 1001*c**5*d**9*x**10/5 + 91*c**4*d**10*x**11 + 91*c**3*d**11*
x**12/3 + 7*c**2*d**12*x**13 + c*d**13*x**14 + d**14*x**15/15, True))
```

3.283 $\int F^{a+b(c+dx)^3}(c+dx)^{11}\,dx$

Optimal. Leaf size=124

$$-\frac{2F^{a+b(c+dx)^3}}{b^4d\log^4(F)}+\frac{2(c+dx)^3F^{a+b(c+dx)^3}}{b^3d\log^3(F)}-\frac{(c+dx)^6F^{a+b(c+dx)^3}}{b^2d\log^2(F)}+\frac{(c+dx)^9F^{a+b(c+dx)^3}}{3bd\log(F)}$$

```
[Out] -2*F^(a+b*(d*x+c)^3)/b^4/d/ln(F)^4+2*F^(a+b*(d*x+c)^3)*(d*x+c)^3/b^3/d/ln(F
)^3-F^(a+b*(d*x+c)^3)*(d*x+c)^6/b^2/d/ln(F)^2+1/3*F^(a+b*(d*x+c)^3)*(d*x+c)
^9/b/d/ln(F)
```

Rubi [A] time = 0.28, antiderivative size = 124, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2212, 2209}

$$-\frac{(c+dx)^6F^{a+b(c+dx)^3}}{b^2d\log^2(F)}+\frac{2(c+dx)^3F^{a+b(c+dx)^3}}{b^3d\log^3(F)}-\frac{2F^{a+b(c+dx)^3}}{b^4d\log^4(F)}+\frac{(c+dx)^9F^{a+b(c+dx)^3}}{3bd\log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^3)*(c + d*x)^11,x]
```

```
[Out] (-2*F^(a + b*(c + d*x)^3))/(b^4*d*Log[F]^4) + (2*F^(a + b*(c + d*x)^3)*(c +
 d*x)^3)/(b^3*d*Log[F]^3) - (F^(a + b*(c + d*x)^3)*(c + d*x)^6)/(b^2*d*Log[
F]^2) + (F^(a + b*(c + d*x)^3)*(c + d*x)^9)/(3*b*d*Log[F])
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int F^{a+b(c+dx)^3}(c+dx)^{11}\,dx = \frac{F^{a+b(c+dx)^3}(c+dx)^9}{3bd\log(F)} - \frac{3\int F^{a+b(c+dx)^3}(c+dx)^8\,dx}{b\log(F)}$$
$$= -\frac{F^{a+b(c+dx)^3}(c+dx)^6}{b^2d\log^2(F)} + \frac{F^{a+b(c+dx)^3}(c+dx)^9}{3bd\log(F)} + \frac{6\int F^{a+b(c+dx)^3}(c+dx)^5\,dx}{b^2\log^2(F)}$$
$$= \frac{2F^{a+b(c+dx)^3}(c+dx)^3}{b^3d\log^3(F)} - \frac{F^{a+b(c+dx)^3}(c+dx)^6}{b^2d\log^2(F)} + \frac{F^{a+b(c+dx)^3}(c+dx)^9}{3bd\log(F)} - \frac{6\int F^{a+b(c+dx)^3}}{b^3\log}$$
$$= -\frac{2F^{a+b(c+dx)^3}}{b^4d\log^4(F)} + \frac{2F^{a+b(c+dx)^3}(c+dx)^3}{b^3d\log^3(F)} - \frac{F^{a+b(c+dx)^3}(c+dx)^6}{b^2d\log^2(F)} + \frac{F^{a+b(c+dx)^3}(c+dx)^9}{3bd\log(F)}$$

Mathematica [A] time = 0.06, size = 75, normalized size = 0.60

$$\frac{F^{a+b(c+dx)^3}\left(b^3\log^3(F)(c+dx)^9 - 3b^2\log^2(F)(c+dx)^6 - 6\left(1-b\log(F)(c+dx)^3\right)\right)}{3b^4d\log^4(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^3)*(c + d*x)^11,x]
```

```
[Out] (F^(a + b*(c + d*x)^3)*(-3*b^2*(c + d*x)^6*Log[F]^2 + b^3*(c + d*x)^9*Log[F
]^3 - 6*(1 - b*(c + d*x)^3*Log[F])))/(3*b^4*d*Log[F]^4)
```

fricas [B] time = 0.43, size = 302, normalized size = 2.44

$$\frac{\left(\left(b^3d^9x^9 + 9\,b^3cd^8x^8 + 36\,b^3c^2d^7x^7 + 84\,b^3c^3d^6x^6 + 126\,b^3c^4d^5x^5 + 126\,b^3c^5d^4x^4 + 84\,b^3c^6d^3x^3 + 36\,b^3c^7d^2x^2 +\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c)^11,x, algorithm="fricas")
```

```
[Out] 1/3*((b^3*d^9*x^9 + 9*b^3*c*d^8*x^8 + 36*b^3*c^2*d^7*x^7 + 84*b^3*c^3*d^6*x
^6 + 126*b^3*c^4*d^5*x^5 + 126*b^3*c^5*d^4*x^4 + 84*b^3*c^6*d^3*x^3 + 36*b^
3*c^7*d^2*x^2 + 9*b^3*c^8*d*x + b^3*c^9)*log(F)^3 - 3*(b^2*d^6*x^6 + 6*b^2*
c*d^5*x^5 + 15*b^2*c^2*d^4*x^4 + 20*b^2*c^3*d^3*x^3 + 15*b^2*c^4*d^2*x^2 +
6*b^2*c^5*d*x + b^2*c^6)*log(F)^2 + 6*(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*
d*x + b*c^3)*log(F) - 6)*F^(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3
 + a)/(b^4*d*log(F)^4)
```

giac [B] time = 0.51, size = 1320, normalized size = 10.65

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c)^11,x, algorithm="giac")
```

```
[Out] 1/3*(b^3*d^9*x^9*e^(b*d^3*x^3*log(F) + 3*b*c*d^2*x^2*log(F) + 3*b*c^2*d*x*l
og(F) + b*c^3*log(F) + a*log(F))*log(F)^3 + 9*b^3*c*d^8*x^8*e^(b*d^3*x^3*lo
g(F) + 3*b*c*d^2*x^2*log(F) + 3*b*c^2*d*x*log(F) + b*c^3*log(F) + a*log(F))
*log(F)^3 + 36*b^3*c^2*d^7*x^7*e^(b*d^3*x^3*log(F) + 3*b*c*d^2*x^2*log(F) +
 3*b*c^2*d*x*log(F) + b*c^3*log(F) + a*log(F))*log(F)^3 + 84*b^3*c^3*d^6*x^
6*e^(b*d^3*x^3*log(F) + 3*b*c*d^2*x^2*log(F) + 3*b*c^2*d*x*log(F) + b*c^3*l
og(F) + a*log(F))*log(F)^3 + 126*b^3*c^4*d^5*x^5*e^(b*d^3*x^3*log(F) + 3*b*
c*d^2*x^2*log(F) + 3*b*c^2*d*x*log(F) + b*c^3*log(F) + a*log(F))*log(F)^3 +
 126*b^3*c^5*d^4*x^4*e^(b*d^3*x^3*log(F) + 3*b*c*d^2*x^2*log(F) + 3*b*c^2*d
*x*log(F) + b*c^3*log(F) + a*log(F))*log(F)^3 + 84*b^3*c^6*d^3*x^3*e^(b*d^3
*x^3*log(F) + 3*b*c*d^2*x^2*log(F) + 3*b*c^2*d*x*log(F) + b*c^3*log(F) + a*
log(F))*log(F)^3 + 36*b^3*c^7*d^2*x^2*e^(b*d^3*x^3*log(F) + 3*b*c*d^2*x^2*l
og(F) + 3*b*c^2*d*x*log(F) + b*c^3*log(F) + a*log(F))*log(F)^3 - 3*b^2*d^6*
x^6*e^(b*d^3*x^3*log(F) + 3*b*c*d^2*x^2*log(F) + 3*b*c^2*d*x*log(F) + b*c^3
*log(F) + a*log(F))*log(F)^2 + 9*b^3*c^8*d*x*e^(b*d^3*x^3*log(F) + 3*b*c*d^
2*x^2*log(F) + 3*b*c^2*d*x*log(F) + b*c^3*log(F) + a*log(F))*log(F)^3 - 18*
b^2*c*d^5*x^5*e^(b*d^3*x^3*log(F) + 3*b*c*d^2*x^2*log(F) + 3*b*c^2*d*x*log(
F) + b*c^3*log(F) + a*log(F))*log(F)^2 + b^3*c^9*e^(b*d^3*x^3*log(F) + 3*b*
c*d^2*x^2*log(F) + 3*b*c^2*d*x*log(F) + b*c^3*log(F) + a*log(F))*log(F)^3 -
 45*b^2*c^2*d^4*x^4*e^(b*d^3*x^3*log(F) + 3*b*c*d^2*x^2*log(F) + 3*b*c^2*d*
x*log(F) + b*c^3*log(F) + a*log(F))*log(F)^2 - 60*b^2*c^3*d^3*x^3*e^(b*d^3*
x^3*log(F) + 3*b*c*d^2*x^2*log(F) + 3*b*c^2*d*x*log(F) + b*c^3*log(F) + a*l
og(F))*log(F)^2 - 45*b^2*c^4*d^2*x^2*e^(b*d^3*x^3*log(F) + 3*b*c*d^2*x^2*lo
g(F) + 3*b*c^2*d*x*log(F) + b*c^3*log(F) + a*log(F))*log(F)^2 - 18*b^2*c^5*
d*x*e^(b*d^3*x^3*log(F) + 3*b*c*d^2*x^2*log(F) + 3*b*c^2*d*x*log(F) + b*c^3
*log(F) + a*log(F))*log(F)^2 - 3*b^2*c^6*e^(b*d^3*x^3*log(F) + 3*b*c*d^2*x^
2*log(F) + 3*b*c^2*d*x*log(F) + b*c^3*log(F) + a*log(F))*log(F)^2 + 6*b*d^3
*x^3*e^(b*d^3*x^3*log(F) + 3*b*c*d^2*x^2*log(F) + 3*b*c^2*d*x*log(F) + b*c^
3*log(F) + a*log(F))*log(F) + 18*b*c*d^2*x^2*e^(b*d^3*x^3*log(F) + 3*b*c*d^
2*x^2*log(F) + 3*b*c^2*d*x*log(F) + b*c^3*log(F) + a*log(F))*log(F) + 18*b*
c^2*d*x*e^(b*d^3*x^3*log(F) + 3*b*c*d^2*x^2*log(F) + 3*b*c^2*d*x*log(F) + b
*c^3*log(F) + a*log(F))*log(F) + 6*b*c^3*e^(b*d^3*x^3*log(F) + 3*b*c*d^2*x^
2*log(F) + 3*b*c^2*d*x*log(F) + b*c^3*log(F) + a*log(F))*log(F) - 6*e^(b*d^
3*x^3*log(F) + 3*b*c*d^2*x^2*log(F) + 3*b*c^2*d*x*log(F) + b*c^3*log(F) + a
*log(F)))/(b^4*d*log(F)^4)
```

maple [B] time = 0.01, size = 365, normalized size = 2.94

$$\frac{\left(b^3 d^9 x^9 \ln(F)^3 + 9b^3 c\, d^8 x^8 \ln(F)^3 + 36b^3 c^2 d^7 x^7 \ln(F)^3 + 84b^3 c^3 d^6 x^6 \ln(F)^3 + 126b^3 c^4 d^5 x^5 \ln(F)^3 + 126b^3 c^5 d^4 x^4 \ln\cdots\right.}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+(d*x+c)^3*b)*(d*x+c)^11,x)
```

```
[Out] 1/3*(b^3*d^9*x^9*ln(F)^3+9*b^3*c*d^8*x^8*ln(F)^3+36*b^3*c^2*d^7*x^7*ln(F)^3
+84*b^3*c^3*d^6*x^6*ln(F)^3+126*b^3*c^4*d^5*x^5*ln(F)^3+126*b^3*c^5*d^4*x^4
*ln(F)^3+84*b^3*c^6*d^3*x^3*ln(F)^3+36*b^3*c^7*d^2*x^2*ln(F)^3+9*b^3*c^8*d*
x*ln(F)^3-3*b^2*d^6*x^6*ln(F)^2+b^3*c^9*ln(F)^3-18*b^2*c*d^5*x^5*ln(F)^2-45
*b^2*c^2*d^4*x^4*ln(F)^2-60*b^2*c^3*d^3*x^3*ln(F)^2-45*b^2*c^4*d^2*x^2*ln(F
)^2-18*b^2*c^5*d*x*ln(F)^2-3*b^2*c^6*ln(F)^2+6*b*d^3*x^3*ln(F)+18*b*c*d^2*x
^2*ln(F)+18*b*c^2*d*x*ln(F)+6*b*c^3*ln(F)-6)*F^(b*d^3*x^3+3*b*c*d^2*x^2+3*b
*c^2*d*x+b*c^3+a)/ln(F)^4/b^4/d
```

maxima [B] time = 2.24, size = 555, normalized size = 4.48

$$\frac{\left(F^{bc^3+a}b^3d^9x^9\log(F)^3 + 9\,F^{bc^3+a}b^3cd^8x^8\log(F)^3 + 36\,F^{bc^3+a}b^3c^2d^7x^7\log(F)^3 + F^{bc^3+a}b^3c^9\log(F)^3 - 3\,F^{bc^3+a}b^2c^6\cdots\right.}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c)^11,x, algorithm="maxima")
```

```
[Out] 1/3*(F^(b*c^3 + a)*b^3*d^9*x^9*log(F)^3 + 9*F^(b*c^3 + a)*b^3*c*d^8*x^8*log
(F)^3 + 36*F^(b*c^3 + a)*b^3*c^2*d^7*x^7*log(F)^3 + F^(b*c^3 + a)*b^3*c^9*l
og(F)^3 - 3*F^(b*c^3 + a)*b^2*c^6*log(F)^2 + 3*(28*F^(b*c^3 + a)*b^3*c^3*d^
6*log(F)^3 - F^(b*c^3 + a)*b^2*d^6*log(F)^2)*x^6 + 18*(7*F^(b*c^3 + a)*b^3*
c^4*d^5*log(F)^3 - F^(b*c^3 + a)*b^2*c*d^5*log(F)^2)*x^5 + 6*F^(b*c^3 + a)*
b*c^3*log(F) + 9*(14*F^(b*c^3 + a)*b^3*c^5*d^4*log(F)^3 - 5*F^(b*c^3 + a)*b
^2*c^2*d^4*log(F)^2)*x^4 + 6*(14*F^(b*c^3 + a)*b^3*c^6*d^3*log(F)^3 - 10*F^
(b*c^3 + a)*b^2*c^3*d^3*log(F)^2 + F^(b*c^3 + a)*b*d^3*log(F))*x^3 + 9*(4*F
^(b*c^3 + a)*b^3*c^7*d^2*log(F)^3 - 5*F^(b*c^3 + a)*b^2*c^4*d^2*log(F)^2 +
2*F^(b*c^3 + a)*b*c*d^2*log(F))*x^2 + 9*(F^(b*c^3 + a)*b^3*c^8*d*log(F)^3 -
 2*F^(b*c^3 + a)*b^2*c^5*d*log(F)^2 + 2*F^(b*c^3 + a)*b*c^2*d*log(F))*x - 6
*F^(b*c^3 + a))*e^(b*d^3*x^3*log(F) + 3*b*c*d^2*x^2*log(F) + 3*b*c^2*d*x*lo
g(F))/(b^4*d*log(F)^4)
```

mupad [B] time = 3.87, size = 323, normalized size = 2.60

$$F^{b\,d^3\,x^3}\,F^{3\,b\,c^2\,d\,x}\,F^a\,F^{b\,c^3}\,F^{3\,b\,c\,d^2\,x^2}\,\left(\frac{b^3\,c^9\,\ln(F)^3-3\,b^2\,c^6\,\ln(F)^2+6\,b\,c^3\,\ln(F)-6}{3\,b^4\,d\,\ln(F)^4}+\frac{d^8\,x^9}{3\,b\,\ln(F)}+\frac{3\,c\,d^7\,x^8}{b\,\ln(F)}+\frac{2\,d^2\,x^3\cdots}{\cdots}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^3)*(c + d*x)^11,x)
```

```
[Out] F^(b*d^3*x^3)*F^(3*b*c^2*d*x)*F^a*F^(b*c^3)*F^(3*b*c*d^2*x^2)*((6*b*c^3*log
(F) - 3*b^2*c^6*log(F)^2 + b^3*c^9*log(F)^3 - 6)/(3*b^4*d*log(F)^4) + (d^8*
x^9)/(3*b*log(F)) + (3*c*d^7*x^8)/(b*log(F)) + (2*d^2*x^3*(14*b^2*c^6*log(F
```

```
)^2 - 10*b*c^3*log(F) + 1))/(b^3*log(F)^3) + (d^5*x^6*(28*b*c^3*log(F) - 1)
)/(b^2*log(F)^2) + (12*c^2*d^6*x^7)/(b*log(F)) + (3*c^2*x*(b^2*c^6*log(F)^2
 - 2*b*c^3*log(F) + 2))/(b^3*log(F)^3) + (3*c^2*d^3*x^4*(14*b*c^3*log(F) -
5))/(b^2*log(F)^2) + (3*c*d*x^2*(4*b^2*c^6*log(F)^2 - 5*b*c^3*log(F) + 2))/
(b^3*log(F)^3) + (6*c*d^4*x^5*(7*b*c^3*log(F) - 1))/(b^2*log(F)^2))
```

sympy [A] time = 0.46, size = 537, normalized size = 4.33

$$\begin{cases} \frac{F^{a+b(c+dx)^3}\left(b^3c^9\log(F)^3+9b^3c^8dx\log(F)^3+36b^3c^7d^2x^2\log(F)^3+84b^3c^6d^3x^3\log(F)^3+126b^3c^5d^4x^4\log(F)^3+126b^3c^4d^5x^5\log(F)^3+84b^3c^3d^6x^6\log(\right.}{} \\ c^{11}x+\frac{11c^{10}dx^2}{2}+\frac{55c^9d^2x^3}{3}+\frac{165c^8d^3x^4}{4}+66c^7d^4x^5+77c^6d^5x^6+66c^5d^6x^7+\frac{165c^4d^7x^8}{4}+\frac{55c^3d^8x^9}{3}+\frac{11c^2d^9x^{10}}{2}+cd^{10}x \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**3)*(d*x+c)**11,x)
```

```
[Out] Piecewise((F**(a + b*(c + d*x)**3)*(b**3*c**9*log(F)**3 + 9*b**3*c**8*d*x*l
og(F)**3 + 36*b**3*c**7*d**2*x**2*log(F)**3 + 84*b**3*c**6*d**3*x**3*log(F)
**3 + 126*b**3*c**5*d**4*x**4*log(F)**3 + 126*b**3*c**4*d**5*x**5*log(F)**3
 + 84*b**3*c**3*d**6*x**6*log(F)**3 + 36*b**3*c**2*d**7*x**7*log(F)**3 + 9*
b**3*c*d**8*x**8*log(F)**3 + b**3*d**9*x**9*log(F)**3 - 3*b**2*c**6*log(F)*
*2 - 18*b**2*c**5*d*x*log(F)**2 - 45*b**2*c**4*d**2*x**2*log(F)**2 - 60*b**
2*c**3*d**3*x**3*log(F)**2 - 45*b**2*c**2*d**4*x**4*log(F)**2 - 18*b**2*c*d
**5*x**5*log(F)**2 - 3*b**2*d**6*x**6*log(F)**2 + 6*b*c**3*log(F) + 18*b*c*
*2*d*x*log(F) + 18*b*c*d**2*x**2*log(F) + 6*b*d**3*x**3*log(F) - 6)/(3*b**4
*d*log(F)**4), Ne(3*b**4*d*log(F)**4, 0)), (c**11*x + 11*c**10*d*x**2/2 + 5
5*c**9*d**2*x**3/3 + 165*c**8*d**3*x**4/4 + 66*c**7*d**4*x**5 + 77*c**6*d**
5*x**6 + 66*c**5*d**6*x**7 + 165*c**4*d**7*x**8/4 + 55*c**3*d**8*x**9/3 + 1
1*c**2*d**9*x**10/2 + c*d**10*x**11 + d**11*x**12/12, True))
```

3.284 $\int F^{a+b(c+dx)^3}(c+dx)^8\,dx$

Optimal. Leaf size=96

$$\frac{2F^{a+b(c+dx)^3}}{3b^3d\log^3(F)}-\frac{2(c+dx)^3F^{a+b(c+dx)^3}}{3b^2d\log^2(F)}+\frac{(c+dx)^6F^{a+b(c+dx)^3}}{3bd\log(F)}$$

```
[Out] 2/3*F^(a+b*(d*x+c)^3)/b^3/d/ln(F)^3-2/3*F^(a+b*(d*x+c)^3)*(d*x+c)^3/b^2/d/l
n(F)^2+1/3*F^(a+b*(d*x+c)^3)*(d*x+c)^6/b/d/ln(F)
```

Rubi [A] time = 0.21, antiderivative size = 96, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2212, 2209}

$$-\frac{2(c+dx)^3F^{a+b(c+dx)^3}}{3b^2d\log^2(F)}+\frac{2F^{a+b(c+dx)^3}}{3b^3d\log^3(F)}+\frac{(c+dx)^6F^{a+b(c+dx)^3}}{3bd\log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^3)*(c + d*x)^8,x]
```

```
[Out] (2*F^(a + b*(c + d*x)^3))/(3*b^3*d*Log[F]^3) - (2*F^(a + b*(c + d*x)^3)*(c
+ d*x)^3)/(3*b^2*d*Log[F]^2) + (F^(a + b*(c + d*x)^3)*(c + d*x)^6)/(3*b*d*L
og[F])
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int F^{a+b(c+dx)^3}(c+dx)^8\,dx = \frac{F^{a+b(c+dx)^3}(c+dx)^6}{3bd\log(F)} - \frac{2\int F^{a+b(c+dx)^3}(c+dx)^5\,dx}{b\log(F)}$$
$$= -\frac{2F^{a+b(c+dx)^3}(c+dx)^3}{3b^2d\log^2(F)} + \frac{F^{a+b(c+dx)^3}(c+dx)^6}{3bd\log(F)} + \frac{2\int F^{a+b(c+dx)^3}(c+dx)^2\,dx}{b^2\log^2(F)}$$
$$= \frac{2F^{a+b(c+dx)^3}}{3b^3d\log^3(F)} - \frac{2F^{a+b(c+dx)^3}(c+dx)^3}{3b^2d\log^2(F)} + \frac{F^{a+b(c+dx)^3}(c+dx)^6}{3bd\log(F)}$$

Mathematica [A] time = 0.04, size = 56, normalized size = 0.58

$$\frac{F^{a+b(c+dx)^3}\left(b^2\log^2(F)(c+dx)^6 - 2b\log(F)(c+dx)^3 + 2\right)}{3b^3d\log^3(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^3)*(c + d*x)^8,x]
```

```
[Out] (F^(a + b*(c + d*x)^3)*(2 - 2*b*(c + d*x)^3*Log[F] + b^2*(c + d*x)^6*Log[F]
^2))/(3*b^3*d*Log[F]^3)
```

fricas [A] time = 0.43, size = 172, normalized size = 1.79

$$\frac{\left(\left(b^2d^6x^6 + 6\,b^2cd^5x^5 + 15\,b^2c^2d^4x^4 + 20\,b^2c^3d^3x^3 + 15\,b^2c^4d^2x^2 + 6\,b^2c^5dx + b^2c^6\right)\log(F)^2 - 2\left(bd^3x^3 + 3\,bcd^2x^2\right.\right.}{3\,b^3d\log(F)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c)^8,x, algorithm="fricas")
```

```
[Out] 1/3*((b^2*d^6*x^6 + 6*b^2*c*d^5*x^5 + 15*b^2*c^2*d^4*x^4 + 20*b^2*c^3*d^3*x
^3 + 15*b^2*c^4*d^2*x^2 + 6*b^2*c^5*d*x + b^2*c^6)*log(F)^2 - 2*(b*d^3*x^3
+ 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3)*log(F) + 2)*F^(b*d^3*x^3 + 3*b*c*d^2
*x^2 + 3*b*c^2*d*x + b*c^3 + a)/(b^3*d*log(F)^3)
```

giac [B] time = 0.45, size = 705, normalized size = 7.34

$$\frac{b^2d^6x^6e^{\left(bd^3x^3\log(F)+3\,bcd^2x^2\log(F)+3\,bc^2dx\log(F)+bc^3\log(F)+a\log(F)\right)}\log(F)^2 + 6\,b^2cd^5x^5e^{\left(bd^3x^3\log(F)+3\,bcd^2x^2\log(F)+3\,bc^2dx\log(\right.}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c)^8,x, algorithm="giac")
```

```
[Out] 1/3*(b^2*d^6*x^6*e^(b*d^3*x^3*log(F) + 3*b*c*d^2*x^2*log(F) + 3*b*c^2*d*x*l
og(F) + b*c^3*log(F) + a*log(F))*log(F)^2 + 6*b^2*c*d^5*x^5*e^(b*d^3*x^3*lo
g(F) + 3*b*c*d^2*x^2*log(F) + 3*b*c^2*d*x*log(F) + b*c^3*log(F) + a*log(F))
*log(F)^2 + 15*b^2*c^2*d^4*x^4*e^(b*d^3*x^3*log(F) + 3*b*c*d^2*x^2*log(F) +
 3*b*c^2*d*x*log(F) + b*c^3*log(F) + a*log(F))*log(F)^2 + 20*b^2*c^3*d^3*x^
3*e^(b*d^3*x^3*log(F) + 3*b*c*d^2*x^2*log(F) + 3*b*c^2*d*x*log(F) + b*c^3*l
og(F) + a*log(F))*log(F)^2 + 15*b^2*c^4*d^2*x^2*e^(b*d^3*x^3*log(F) + 3*b*c
*d^2*x^2*log(F) + 3*b*c^2*d*x*log(F) + b*c^3*log(F) + a*log(F))*log(F)^2 +
6*b^2*c^5*d*x*e^(b*d^3*x^3*log(F) + 3*b*c*d^2*x^2*log(F) + 3*b*c^2*d*x*log(
F) + b*c^3*log(F) + a*log(F))*log(F)^2 + b^2*c^6*e^(b*d^3*x^3*log(F) + 3*b*
c*d^2*x^2*log(F) + 3*b*c^2*d*x*log(F) + b*c^3*log(F) + a*log(F))*log(F)^2 -
 2*b*d^3*x^3*e^(b*d^3*x^3*log(F) + 3*b*c*d^2*x^2*log(F) + 3*b*c^2*d*x*log(F
) + b*c^3*log(F) + a*log(F))*log(F) - 6*b*c*d^2*x^2*e^(b*d^3*x^3*log(F) + 3
*b*c*d^2*x^2*log(F) + 3*b*c^2*d*x*log(F) + b*c^3*log(F) + a*log(F))*log(F)
- 6*b*c^2*d*x*e^(b*d^3*x^3*log(F) + 3*b*c*d^2*x^2*log(F) + 3*b*c^2*d*x*log(
F) + b*c^3*log(F) + a*log(F))*log(F) - 2*b*c^3*e^(b*d^3*x^3*log(F) + 3*b*c*
d^2*x^2*log(F) + 3*b*c^2*d*x*log(F) + b*c^3*log(F) + a*log(F))*log(F) + 2*e
^(b*d^3*x^3*log(F) + 3*b*c*d^2*x^2*log(F) + 3*b*c^2*d*x*log(F) + b*c^3*log(
F) + a*log(F)))/(b^3*d*log(F)^3)
```

maple [B] time = 0.01, size = 200, normalized size = 2.08

$$\frac{\left(b^2 d^6 x^6 \ln(F)^2 + 6 b^2 c\, d^5 x^5 \ln(F)^2 + 15 b^2 c^2 d^4 x^4 \ln(F)^2 + 20 b^2 c^3 d^3 x^3 \ln(F)^2 + 15 b^2 c^4 d^2 x^2 \ln(F)^2 + 6 b^2 c^5 d x \ln(F)\right.}{3 b^3 d \ln}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+(d*x+c)^3*b)*(d*x+c)^8,x)
```

```
[Out] 1/3*(b^2*d^6*x^6*ln(F)^2+6*b^2*c*d^5*x^5*ln(F)^2+15*b^2*c^2*d^4*x^4*ln(F)^2
+20*b^2*c^3*d^3*x^3*ln(F)^2+15*b^2*c^4*d^2*x^2*ln(F)^2+6*b^2*c^5*d*x*ln(F)^
2+b^2*c^6*ln(F)^2-2*b*d^3*x^3*ln(F)-6*b*c*d^2*x^2*ln(F)-6*b*c^2*d*x*ln(F)-2
*b*c^3*ln(F)+2)*F^(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)/ln(F)^3/b^3
/d
```

maxima [B] time = 2.13, size = 308, normalized size = 3.21

$$\frac{\left(F^{bc^3+a} b^2 d^6 x^6 \log(F)^2 + 6\, F^{bc^3+a} b^2 c d^5 x^5 \log(F)^2 + 15\, F^{bc^3+a} b^2 c^2 d^4 x^4 \log(F)^2 + F^{bc^3+a} b^2 c^6 \log(F)^2 - 2\, F^{bc^3+a} b c^3\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c)^8,x, algorithm="maxima")
```

```
[Out] 1/3*(F^(b*c^3 + a)*b^2*d^6*x^6*log(F)^2 + 6*F^(b*c^3 + a)*b^2*c*d^5*x^5*log
(F)^2 + 15*F^(b*c^3 + a)*b^2*c^2*d^4*x^4*log(F)^2 + F^(b*c^3 + a)*b^2*c^6*l
```

```
og(F)^2 - 2*F^(b*c^3 + a)*b*c^3*log(F) + 2*(10*F^(b*c^3 + a)*b^2*c^3*d^3*lo
g(F)^2 - F^(b*c^3 + a)*b*d^3*log(F))*x^3 + 3*(5*F^(b*c^3 + a)*b^2*c^4*d^2*l
og(F)^2 - 2*F^(b*c^3 + a)*b*c*d^2*log(F))*x^2 + 6*(F^(b*c^3 + a)*b^2*c^5*d*
log(F)^2 - F^(b*c^3 + a)*b*c^2*d*log(F))*x + 2*F^(b*c^3 + a))*e^(b*d^3*x^3*
log(F) + 3*b*c*d^2*x^2*log(F) + 3*b*c^2*d*x*log(F))/(b^3*d*log(F)^3)
```

mupad [B] time = 3.66, size = 196, normalized size = 2.04

$$F^{b\,d^3\,x^3}\,F^{3\,b\,c^2\,d\,x}\,F^a\,F^{b\,c^3}\,F^{3\,b\,c\,d^2\,x^2}\,\left(\frac{b^2\,c^6\,\ln(F)^2-2\,b\,c^3\,\ln(F)+2}{3\,b^3\,d\,\ln(F)^3}+\frac{d^5\,x^6}{3\,b\,\ln(F)}+\frac{2\,c^2\,x\,\left(b\,c^3\,\ln(F)-1\right)}{b^2\,\ln(F)^2}+\frac{2\,c\,d^4\,x^5}{b\,\ln(F)}+\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^3)*(c + d*x)^8,x)
```

```
[Out] F^(b*d^3*x^3)*F^(3*b*c^2*d*x)*F^a*F^(b*c^3)*F^(3*b*c*d^2*x^2)*((b^2*c^6*log
(F)^2 - 2*b*c^3*log(F) + 2)/(3*b^3*d*log(F)^3) + (d^5*x^6)/(3*b*log(F)) + (
2*c^2*x*(b*c^3*log(F) - 1))/(b^2*log(F)^2) + (2*c*d^4*x^5)/(b*log(F)) + (2*
d^2*x^3*(10*b*c^3*log(F) - 1))/(3*b^2*log(F)^2) + (5*c^2*d^3*x^4)/(b*log(F)
) + (c*d*x^2*(5*b*c^3*log(F) - 2))/(b^2*log(F)^2))
```

sympy [A] time = 0.34, size = 306, normalized size = 3.19

$$\begin{cases} \frac{F^{a+b(c+dx)^3}\left(b^2c^6\log(F)^2+6b^2c^5dx\log(F)^2+15b^2c^4d^2x^2\log(F)^2+20b^2c^3d^3x^3\log(F)^2+15b^2c^2d^4x^4\log(F)^2+6b^2cd^5x^5\log(F)^2+b^2d^6x^6\log(F)^2-2bc^3\right.}{3b^3d\log(F)^3} \\ c^8x+4c^7dx^2+\frac{28c^6d^2x^3}{3}+14c^5d^3x^4+14c^4d^4x^5+\frac{28c^3d^5x^6}{3}+4c^2d^6x^7+cd^7x^8+\frac{d^8x^9}{9} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**3)*(d*x+c)**8,x)
```

```
[Out] Piecewise((F**(a + b*(c + d*x)**3)*(b**2*c**6*log(F)**2 + 6*b**2*c**5*d*x*l
og(F)**2 + 15*b**2*c**4*d**2*x**2*log(F)**2 + 20*b**2*c**3*d**3*x**3*log(F)
**2 + 15*b**2*c**2*d**4*x**4*log(F)**2 + 6*b**2*c*d**5*x**5*log(F)**2 + b**
2*d**6*x**6*log(F)**2 - 2*b*c**3*log(F) - 6*b*c**2*d*x*log(F) - 6*b*c*d**2*
x**2*log(F) - 2*b*d**3*x**3*log(F) + 2)/(3*b**3*d*log(F)**3), Ne(3*b**3*d*l
og(F)**3, 0)), (c**8*x + 4*c**7*d*x**2 + 28*c**6*d**2*x**3/3 + 14*c**5*d**3
*x**4 + 14*c**4*d**4*x**5 + 28*c**3*d**5*x**6/3 + 4*c**2*d**6*x**7 + c*d**7
*x**8 + d**8*x**9/9, True))
```

3.285 $\int F^{a+b(c+dx)^3}(c+dx)^5\,dx$

Optimal. Leaf size=62

$$\frac{(c+dx)^3F^{a+b(c+dx)^3}}{3bd\log(F)}-\frac{F^{a+b(c+dx)^3}}{3b^2d\log^2(F)}$$

```
[Out] -1/3*F^(a+b*(d*x+c)^3)/b^2/d/ln(F)^2+1/3*F^(a+b*(d*x+c)^3)*(d*x+c)^3/b/d/ln
(F)
```

Rubi [A] time = 0.14, antiderivative size = 62, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2212, 2209}

$$\frac{(c+dx)^3F^{a+b(c+dx)^3}}{3bd\log(F)}-\frac{F^{a+b(c+dx)^3}}{3b^2d\log^2(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^3)*(c + d*x)^5,x]
```

```
[Out] -F^(a + b*(c + d*x)^3)/(3*b^2*d*Log[F]^2) + (F^(a + b*(c + d*x)^3)*(c + d*x
)^3)/(3*b*d*Log[F])
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int F^{a+b(c+dx)^3}(c+dx)^5\,dx = \frac{F^{a+b(c+dx)^3}(c+dx)^3}{3bd\log(F)} - \frac{\int F^{a+b(c+dx)^3}(c+dx)^2\,dx}{b\log(F)}$$
$$= -\frac{F^{a+b(c+dx)^3}}{3b^2d\log^2(F)} + \frac{F^{a+b(c+dx)^3}(c+dx)^3}{3bd\log(F)}$$

Mathematica [A] time = 0.03, size = 40, normalized size = 0.65

$$\frac{F^{a+b(c+dx)^3}\left(b\log(F)(c+dx)^3-1\right)}{3b^2d\log^2(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^3)*(c + d*x)^5,x]
```

```
[Out] (F^(a + b*(c + d*x)^3)*(-1 + b*(c + d*x)^3*Log[F]))/(3*b^2*d*Log[F]^2)
```

fricas [A] time = 0.44, size = 84, normalized size = 1.35

$$\frac{\left(\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3\right)\log(F)-1\right)F^{bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a}}{3\,b^2d\log(F)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c)^5,x, algorithm="fricas")
```

```
[Out] 1/3*((b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3)*log(F) - 1)*F^(b*d^3
*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a)/(b^2*d*log(F)^2)
```

giac [B] time = 0.39, size = 891, normalized size = 14.37

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c)^5,x, algorithm="giac")
```

```
[Out] 1/6*(2*(2*(((d*x + c)^3*b*log(abs(F)) - 1)*(pi^2*b^2*sgn(F) - pi^2*b^2 + 2*
b^2*log(abs(F))^2)/((pi^2*b^2*sgn(F) - pi^2*b^2 + 2*b^2*log(abs(F))^2)^2 +
4*(pi*b^2*log(abs(F))*sgn(F) - pi*b^2*log(abs(F)))^2) + (pi*(d*x + c)^3*b*s
gn(F) - pi*(d*x + c)^3*b)*(pi*b^2*log(abs(F))*sgn(F) - pi*b^2*log(abs(F)))/
((pi^2*b^2*sgn(F) - pi^2*b^2 + 2*b^2*log(abs(F))^2)^2 + 4*(pi*b^2*log(abs(F
))*sgn(F) - pi*b^2*log(abs(F)))^2))*cos(-1/2*pi*b*d^3*x^3*sgn(F) + 1/2*pi*b
```

```
*d^3*x^3 - 3/2*pi*b*c*d^2*x^2*sgn(F) + 3/2*pi*b*c*d^2*x^2 - 3/2*pi*b*c^2*d*
x*sgn(F) + 3/2*pi*b*c^2*d*x - 1/2*pi*b*c^3*sgn(F) + 1/2*pi*b*c^3 - 1/2*pi*a
*sgn(F) + 1/2*pi*a) + ((pi*(d*x + c)^3*b*sgn(F) - pi*(d*x + c)^3*b)*(pi^2*b
^2*sgn(F) - pi^2*b^2 + 2*b^2*log(abs(F))^2)/((pi^2*b^2*sgn(F) - pi^2*b^2 +
2*b^2*log(abs(F))^2)^2 + 4*(pi*b^2*log(abs(F))*sgn(F) - pi*b^2*log(abs(F)))
^2) - 4*((d*x + c)^3*b*log(abs(F)) - 1)*(pi*b^2*log(abs(F))*sgn(F) - pi*b^2
*log(abs(F)))/((pi^2*b^2*sgn(F) - pi^2*b^2 + 2*b^2*log(abs(F))^2)^2 + 4*(pi
*b^2*log(abs(F))*sgn(F) - pi*b^2*log(abs(F)))^2))*sin(-1/2*pi*b*d^3*x^3*sgn
(F) + 1/2*pi*b*d^3*x^3 - 3/2*pi*b*c*d^2*x^2*sgn(F) + 3/2*pi*b*c*d^2*x^2 - 3
/2*pi*b*c^2*d*x*sgn(F) + 3/2*pi*b*c^2*d*x - 1/2*pi*b*c^3*sgn(F) + 1/2*pi*b*
c^3 - 1/2*pi*a*sgn(F) + 1/2*pi*a))*e^((d*x + c)^3*b*log(abs(F)) + a*log(abs
(F))) - ((2*(d*x + c)^3*b*i*log(abs(F)) - pi*(d*x + c)^3*b*sgn(F) + pi*(d*x
 + c)^3*b - 2*i)*e^(1/2*(pi*(d*x + c)^3*b*(sgn(F) - 1) + pi*a*(sgn(F) - 1))
*i)/(2*pi*b^2*i*log(abs(F))*sgn(F) - 2*pi*b^2*i*log(abs(F)) + pi^2*b^2*sgn(
F) - pi^2*b^2 + 2*b^2*log(abs(F))^2) + (2*(d*x + c)^3*b*i*log(abs(F)) + pi*
(d*x + c)^3*b*sgn(F) - pi*(d*x + c)^3*b - 2*i)*e^(-1/2*(pi*(d*x + c)^3*b*(s
gn(F) - 1) + pi*a*(sgn(F) - 1))*i)/(2*pi*b^2*i*log(abs(F))*sgn(F) - 2*pi*b^
2*i*log(abs(F)) - pi^2*b^2*sgn(F) + pi^2*b^2 - 2*b^2*log(abs(F))^2))*e^((d*
x + c)^3*b*log(abs(F)) + a*log(abs(F)))/i)/d
```

maple [A] time = 0.01, size = 89, normalized size = 1.44

$$\frac{\left(b\,d^3x^3\ln(F)+3bc\,d^2x^2\ln(F)+3b\,c^2dx\ln(F)+b\,c^3\ln(F)-1\right)F^{b\,d^3x^3+3bc\,d^2x^2+3b\,c^2dx+b\,c^3+a}}{3b^2d\ln(F)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+(d*x+c)^3*b)*(d*x+c)^5,x)
```

```
[Out] 1/3*(b*d^3*x^3*ln(F)+3*b*c*d^2*x^2*ln(F)+3*b*c^2*d*x*ln(F)+b*c^3*ln(F)-1)*F
^(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)/ln(F)^2/b^2/d
```

maxima [B] time = 2.09, size = 133, normalized size = 2.15

$$\frac{\left(F^{bc^3+a}bd^3x^3\log(F)+3\,F^{bc^3+a}bcd^2x^2\log(F)+3\,F^{bc^3+a}bc^2dx\log(F)+F^{bc^3+a}bc^3\log(F)-F^{bc^3+a}\right)e^{\left(bd^3x^3\log(F)+3\,bcd\right.}}{3\,b^2d\log(F)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c)^5,x, algorithm="maxima")
```

```
[Out] 1/3*(F^(b*c^3 + a)*b*d^3*x^3*log(F) + 3*F^(b*c^3 + a)*b*c*d^2*x^2*log(F) +
3*F^(b*c^3 + a)*b*c^2*d*x*log(F) + F^(b*c^3 + a)*b*c^3*log(F) - F^(b*c^3 +
a))*e^(b*d^3*x^3*log(F) + 3*b*c*d^2*x^2*log(F) + 3*b*c^2*d*x*log(F))/(b^2*d
*log(F)^2)
```

mupad [B] time = 3.63, size = 95, normalized size = 1.53

$$\frac{F^{b\,d^3\,x^3}\,F^{3\,b\,c^2\,d\,x}\,F^a\,F^{b\,c^3}\,F^{3\,b\,c\,d^2\,x^2}\,\left(b\,\ln(F)\,c^3+3\,b\,\ln(F)\,c^2\,d\,x+3\,b\,\ln(F)\,c\,d^2\,x^2+b\,\ln(F)\,d^3\,x^3-1\right)}{3\,b^2\,d\,\ln(F)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^3)*(c + d*x)^5,x)
```

```
[Out] (F^(b*d^3*x^3)*F^(3*b*c^2*d*x)*F^a*F^(b*c^3)*F^(3*b*c*d^2*x^2)*(b*c^3*log(F
) + b*d^3*x^3*log(F) + 3*b*c^2*d*x*log(F) + 3*b*c*d^2*x^2*log(F) - 1))/(3*b
^2*d*log(F)^2)
```

sympy [A] time = 0.24, size = 144, normalized size = 2.32

$$\begin{cases} \frac{F^{a+b(c+dx)^3}\left(bc^3\log(F)+3bc^2dx\log(F)+3bcd^2x^2\log(F)+bd^3x^3\log(F)-1\right)}{3b^2d\log(F)^2} & \text{for } 3b^2d\log(F)^2\neq 0 \\ c^5x+\frac{5c^4dx^2}{2}+\frac{10c^3d^2x^3}{3}+\frac{5c^2d^3x^4}{2}+cd^4x^5+\frac{d^5x^6}{6} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**3)*(d*x+c)**5,x)
```

```
[Out] Piecewise(((F**(a + b*(c + d*x)**3)*(b*c**3*log(F) + 3*b*c**2*d*x*log(F) + 3
*b*c*d**2*x**2*log(F) + b*d**3*x**3*log(F) - 1)/(3*b**2*d*log(F)**2), Ne(3*
b**2*d*log(F)**2, 0)), (c**5*x + 5*c**4*d*x**2/2 + 10*c**3*d**2*x**3/3 + 5*
c**2*d**3*x**4/2 + c*d**4*x**5 + d**5*x**6/6, True))
```

3.286 $\int F^{a+b(c+dx)^3}(c+dx)^2\,dx$

Optimal. Leaf size=27

$$\frac{F^{a+b(c+dx)^3}}{3bd\log(F)}$$

```
[Out] 1/3*F^(a+b*(d*x+c)^3)/b/d/ln(F)
```

Rubi [A] time = 0.07, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2209}

$$\frac{F^{a+b(c+dx)^3}}{3bd\log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^3)*(c + d*x)^2,x]
```

```
[Out] F^(a + b*(c + d*x)^3)/(3*b*d*Log[F])
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+b(c+dx)^3}(c+dx)^2\,dx=\frac{F^{a+b(c+dx)^3}}{3bd\log(F)}$$

Mathematica [A] time = 0.01, size = 27, normalized size = 1.00

$$\frac{F^{a+b(c+dx)^3}}{3bd\log(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^3)*(c + d*x)^2,x]
```

```
[Out] F^(a + b*(c + d*x)^3)/(3*b*d*Log[F])
```

fricas [A] time = 0.42, size = 47, normalized size = 1.74

$$\frac{F^{bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a}}{3\,bd\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c)^2,x, algorithm="fricas")
[Out] 1/3*F^(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a)/(b*d*log(F))
```

giac [A] time = 0.23, size = 47, normalized size = 1.74

$$\frac{F^{bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a}}{3\,bd\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c)^2,x, algorithm="giac")
[Out] 1/3*F^(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a)/(b*d*log(F))
```

maple [A] time = 0.01, size = 48, normalized size = 1.78

$$\frac{F^{b\,d^3x^3+3bc\,d^2x^2+3b\,c^2dx+b\,c^3+a}}{3bd\ln(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+(d*x+c)^3*b)*(d*x+c)^2,x)
[Out] 1/3*F^(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)/b/d/ln(F)
```

maxima [A] time = 0.88, size = 25, normalized size = 0.93

$$\frac{F^{(dx+c)^3b+a}}{3\,bd\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c)^2,x, algorithm="maxima")
[Out] 1/3*F^((d*x + c)^3*b + a)/(b*d*log(F))
```

mupad [B] time = 3.53, size = 25, normalized size = 0.93

$$\frac{F^{a+b\,(c+d\,x)^3}}{3\,b\,d\,\ln(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^3)*(c + d*x)^2,x)
```

```
[Out] F^(a + b*(c + d*x)^3)/(3*b*d*log(F))
```

sympy [A] time = 0.18, size = 46, normalized size = 1.70

$$\begin{cases} \frac{F^{a+b(c+dx)^3}}{3bd\log(F)} & \text{for } 3bd\log(F) \neq 0 \\ c^2x + cdx^2 + \frac{d^2x^3}{3} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**3)*(d*x+c)**2,x)
```

```
[Out] Piecewise((F**(a + b*(c + d*x)**3)/(3*b*d*log(F)), Ne(3*b*d*log(F), 0)), (c
**2*x + c*d*x**2 + d**2*x**3/3, True))
```

3.287 $\int \frac{F^{a+b(c+dx)^3}}{c+dx} dx$

Optimal. Leaf size=22

$$\frac{F^a \text{Ei}\left(b(c+dx)^3 \log(F)\right)}{3d}$$

[Out] 1/3*F^a*Ei(b*(d*x+c)^3*ln(F))/d

Rubi [A] time = 0.07, antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2210}

$$\frac{F^a \text{Ei}\left(b(c+dx)^3 \log(F)\right)}{3d}$$

Antiderivative was successfully verified.

[In] Int[F^(a + b*(c + d*x)^3)/(c + d*x),x]

[Out] (F^a*ExpIntegralEi[b*(c + d*x)^3*Log[F]])/(3*d)

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^3}}{c+dx} dx = \frac{F^a \text{Ei}\left(b(c+dx)^3 \log(F)\right)}{3d}$$

Mathematica [A] time = 0.01, size = 22, normalized size = 1.00

$$\frac{F^a \text{Ei}\left(b(c+dx)^3 \log(F)\right)}{3d}$$

Antiderivative was successfully verified.

[In] Integrate[F^(a + b*(c + d*x)^3)/(c + d*x),x]

[Out] (F^a*ExpIntegralEi[b*(c + d*x)^3*Log[F]])/(3*d)

fricas [B] time = 0.43, size = 44, normalized size = 2.00

$$\frac{F^{a}\mathrm{Ei}\left(\left(bd^{3}x^{3}+3\,bcd^{2}x^{2}+3\,bc^{2}dx+bc^{3}\right)\log(F)\right)}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c),x, algorithm="fricas")
```

```
[Out] 1/3*F^a*Ei((b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3)*log(F))/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^{3}b+a}}{dx+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c),x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^3*b + a)/(d*x + c), x)
```

maple [F] time = 0.09, size = 0, normalized size = 0.00

$$\int \frac{F^{a+(dx+c)^{3}b}}{dx+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+(d*x+c)^3*b)/(d*x+c),x)
```

```
[Out] int(F^(a+(d*x+c)^3*b)/(d*x+c),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^{3}b+a}}{dx+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c),x, algorithm="maxima")
```

```
[Out] integrate(F^((d*x + c)^3*b + a)/(d*x + c), x)
```

mupad [B] time = 3.58, size = 20, normalized size = 0.91

$$\frac{F^{a}\,\mathrm{ei}\left(b\,\ln(F)\,(c+d\,x)^{3}\right)}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^3)/(c + d*x),x)
```

```
[Out] (F^a*ei(b*log(F)*(c + d*x)^3))/(3*d)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b(c+dx)^3}}{c+dx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**3)/(d*x+c),x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**3)/(c + d*x), x)
```

3.288 $\int \frac{F^{a+b(c+dx)^3}}{(c+dx)^4} dx$

Optimal. Leaf size=53

$$\frac{bF^a \log(F)\text{Ei}\left(b(c+dx)^3\log(F)\right)}{3d} - \frac{F^{a+b(c+dx)^3}}{3d(c+dx)^3}$$

```
[Out] -1/3*F^(a+b*(d*x+c)^3)/d/(d*x+c)^3+1/3*b*F^a*Ei(b*(d*x+c)^3*ln(F))*ln(F)/d
```

Rubi [A] time = 0.13, antiderivative size = 53, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2214, 2210}

$$\frac{bF^a \log(F)\text{Ei}\left(b(c+dx)^3\log(F)\right)}{3d} - \frac{F^{a+b(c+dx)^3}}{3d(c+dx)^3}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^3)/(c + d*x)^4,x]
```

```
[Out] -F^(a + b*(c + d*x)^3)/(3*d*(c + d*x)^3) + (b*F^a*ExpIntegralEi[b*(c + d*x)
^3*Log[F]]*Log[F])/(3*d)
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^3}}{(c+dx)^4}\,dx = -\frac{F^{a+b(c+dx)^3}}{3d(c+dx)^3} + (b\log(F))\int \frac{F^{a+b(c+dx)^3}}{c+dx}\,dx$$
$$= -\frac{F^{a+b(c+dx)^3}}{3d(c+dx)^3} + \frac{bF^a\operatorname{Ei}\left(b(c+dx)^3\log(F)\right)\log(F)}{3d}$$

Mathematica [A] time = 0.03, size = 47, normalized size = 0.89

$$\frac{F^a\left(b\log(F)\operatorname{Ei}\left(b(c+dx)^3\log(F)\right) - \frac{F^{b(c+dx)^3}}{(c+dx)^3}\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^3)/(c + d*x)^4,x]
```

```
[Out] (F^a*(-(F^(b*(c + d*x)^3)/(c + d*x)^3) + b*ExpIntegralEi[b*(c + d*x)^3*Log[
F]]*Log[F]))/(3*d)
```

fricas [B] time = 0.46, size = 147, normalized size = 2.77

$$\frac{\left(bd^3x^3 + 3\,bcd^2x^2 + 3\,bc^2dx + bc^3\right)F^a\operatorname{Ei}\left(\left(bd^3x^3 + 3\,bcd^2x^2 + 3\,bc^2dx + bc^3\right)\log(F)\right)\log(F) - F^{bd^3x^3+3\,bcd^2x^2+3\,bc^2dx}}{3\left(d^4x^3 + 3\,cd^3x^2 + 3\,c^2d^2x + c^3d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c)^4,x, algorithm="fricas")
```

```
[Out] 1/3*((b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3)*F^a*Ei((b*d^3*x^3 +
3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3)*log(F))*log(F) - F^(b*d^3*x^3 + 3*b*c*
d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a))/(d^4*x^3 + 3*c*d^3*x^2 + 3*c^2*d^2*x +
c^3*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^3b+a}}{(dx+c)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c)^4,x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^3*b + a)/(d*x + c)^4, x)
```

maple [F] time = 0.09, size = 0, normalized size = 0.00

$$\int \frac{F^{a+(dx+c)^{3}b}}{(dx+c)^{4}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+(d*x+c)^3*b)/(d*x+c)^4,x)
```

```
[Out] int(F^(a+(d*x+c)^3*b)/(d*x+c)^4,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^{3}b+a}}{(dx+c)^{4}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c)^4,x, algorithm="maxima")
```

```
[Out] integrate(F^((d*x + c)^3*b + a)/(d*x + c)^4, x)
```

mupad [B] time = 3.92, size = 51, normalized size = 0.96

$$-\frac{F^{a}\,\left(F^{b\,{\left(c+d\,x\right)}^3}+b\,\ln\left(F\right)\,\mathrm{expint}\left(-b\,\ln\left(F\right)\,{\left(c+d\,x\right)}^3\right)\,{\left(c+d\,x\right)}^3\right)}{3\,d\,{\left(c+d\,x\right)}^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^3)/(c + d*x)^4,x)
```

```
[Out] -(F^a*(F^(b*(c + d*x)^3) + b*log(F)*expint(-b*log(F)*(c + d*x)^3)*(c + d*x)
^3))/(3*d*(c + d*x)^3)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**3)/(d*x+c)**4,x)
```

```
[Out] Timed out
```

3.289 $\int \frac{F^{a+b(c+dx)^3}}{(c+dx)^7} dx$

Optimal. Leaf size=87

$$\frac{b^2 F^a \log^2(F)\text{Ei}\left(b(c+dx)^3\log(F)\right)}{6d}-\frac{F^{a+b(c+dx)^3}}{6d(c+dx)^6}-\frac{b\log(F)F^{a+b(c+dx)^3}}{6d(c+dx)^3}$$

```
[Out] -1/6*F^(a+b*(d*x+c)^3)/d/(d*x+c)^6-1/6*b*F^(a+b*(d*x+c)^3)*ln(F)/d/(d*x+c)^
3+1/6*b^2*F^a*Ei(b*(d*x+c)^3*ln(F))*ln(F)^2/d
```

Rubi [A] time = 0.19, antiderivative size = 87, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2214, 2210}

$$\frac{b^2 F^a \log^2(F)\text{Ei}\left(b(c+dx)^3\log(F)\right)}{6d}-\frac{F^{a+b(c+dx)^3}}{6d(c+dx)^6}-\frac{b\log(F)F^{a+b(c+dx)^3}}{6d(c+dx)^3}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^3)/(c + d*x)^7,x]
```

```
[Out] -F^(a + b*(c + d*x)^3)/(6*d*(c + d*x)^6) - (b*F^(a + b*(c + d*x)^3)*Log[F])
/(6*d*(c + d*x)^3) + (b^2*F^a*ExpIntegralEi[b*(c + d*x)^3*Log[F]]*Log[F]^2)
/(6*d)
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^3}}{(c+dx)^7}\,dx = -\frac{F^{a+b(c+dx)^3}}{6d(c+dx)^6} + \frac{1}{2}(b\log(F))\int \frac{F^{a+b(c+dx)^3}}{(c+dx)^4}\,dx$$
$$= -\frac{F^{a+b(c+dx)^3}}{6d(c+dx)^6} - \frac{bF^{a+b(c+dx)^3}\log(F)}{6d(c+dx)^3} + \frac{1}{2}\left(b^2\log^2(F)\right)\int \frac{F^{a+b(c+dx)^3}}{c+dx}\,dx$$
$$= -\frac{F^{a+b(c+dx)^3}}{6d(c+dx)^6} - \frac{bF^{a+b(c+dx)^3}\log(F)}{6d(c+dx)^3} + \frac{b^2F^a\mathrm{Ei}\left(b(c+dx)^3\log(F)\right)\log^2(F)}{6d}$$

Mathematica [A] time = 0.08, size = 64, normalized size = 0.74

$$\frac{F^a\left(b^2\log^2(F)\mathrm{Ei}\left(b(c+dx)^3\log(F)\right) - \frac{F^{b(c+dx)^3}\left(b\log(F)(c+dx)^3+1\right)}{(c+dx)^6}\right)}{6d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^3)/(c + d*x)^7,x]
```

```
[Out] (F^a*(b^2*ExpIntegralEi[b*(c + d*x)^3*Log[F]]*Log[F]^2 - (F^(b*(c + d*x)^3)
*(1 + b*(c + d*x)^3*Log[F]))/(c + d*x)^6))/(6*d)
```

fricas [B] time = 0.44, size = 269, normalized size = 3.09

$$\frac{\left(b^2d^6x^6 + 6\,b^2cd^5x^5 + 15\,b^2c^2d^4x^4 + 20\,b^2c^3d^3x^3 + 15\,b^2c^4d^2x^2 + 6\,b^2c^5dx + b^2c^6\right)F^a\mathrm{Ei}\left(\left(bd^3x^3 + 3\,bcd^2x^2 + 3\,b\right.\right.}{6\left(d^7x^6 + 6\,cd^6x^5 + 15\,c^2d^5x^4 + 20\,c^3d^4\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c)^7,x, algorithm="fricas")
```

```
[Out] 1/6*((b^2*d^6*x^6 + 6*b^2*c*d^5*x^5 + 15*b^2*c^2*d^4*x^4 + 20*b^2*c^3*d^3*x
^3 + 15*b^2*c^4*d^2*x^2 + 6*b^2*c^5*d*x + b^2*c^6)*F^a*Ei((b*d^3*x^3 + 3*b*
c*d^2*x^2 + 3*b*c^2*d*x + b*c^3)*log(F))*log(F)^2 - ((b*d^3*x^3 + 3*b*c*d^2
*x^2 + 3*b*c^2*d*x + b*c^3)*log(F) + 1)*F^(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*
c^2*d*x + b*c^3 + a))/(d^7*x^6 + 6*c*d^6*x^5 + 15*c^2*d^5*x^4 + 20*c^3*d^4*
x^3 + 15*c^4*d^3*x^2 + 6*c^5*d^2*x + c^6*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^3b+a}}{(dx+c)^7}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c)^7,x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^3*b + a)/(d*x + c)^7, x)
```

maple [F] time = 0.10, size = 0, normalized size = 0.00

$$\int \frac{F^{a+(dx+c)^3 b}}{(dx+c)^7}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+(d*x+c)^3*b)/(d*x+c)^7,x)
```

```
[Out] int(F^(a+(d*x+c)^3*b)/(d*x+c)^7,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^3 b+a}}{(dx+c)^7}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c)^7,x, algorithm="maxima")
```

```
[Out] integrate(F^((d*x + c)^3*b + a)/(d*x + c)^7, x)
```

mupad [B] time = 4.88, size = 76, normalized size = 0.87

$$-\frac{F^a\,b^2\,\ln(F)^2\,\left(\frac{\mathrm{expint}\left(-b\,\ln(F)\,(c+d\,x)^3\right)}{2}+F^{b\,(c+d\,x)^3}\,\left(\frac{1}{2\,b\,\ln(F)\,(c+d\,x)^3}+\frac{1}{2\,b^2\,\ln(F)^2\,(c+d\,x)^6}\right)\right)}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^3)/(c + d*x)^7,x)
```

```
[Out] -(F^a*b^2*log(F)^2*(expint(-b*log(F)*(c + d*x)^3)/2 + F^(b*(c + d*x)^3)*(1/
(2*b*log(F)*(c + d*x)^3) + 1/(2*b^2*log(F)^2*(c + d*x)^6))))/(3*d)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**3)/(d*x+c)**7,x)
```

```
[Out] Timed out
```

3.290 $\int \frac{F^{a+b(c+dx)^3}}{(c+dx)^{10}} dx$

Optimal. Leaf size=121

$$\frac{b^3F^a\log^3(F)\text{Ei}\left(b(c+dx)^3\log(F)\right)}{18d}-\frac{b^2\log^2(F)F^{a+b(c+dx)^3}}{18d(c+dx)^3}-\frac{F^{a+b(c+dx)^3}}{9d(c+dx)^9}-\frac{b\log(F)F^{a+b(c+dx)^3}}{18d(c+dx)^6}$$

```
[Out] -1/9*F^(a+b*(d*x+c)^3)/d/(d*x+c)^9-1/18*b*F^(a+b*(d*x+c)^3)*ln(F)/d/(d*x+c)
^6-1/18*b^2*F^(a+b*(d*x+c)^3)*ln(F)^2/d/(d*x+c)^3+1/18*b^3*F^a*Ei(b*(d*x+c)
^3*ln(F))*ln(F)^3/d
```

Rubi [A] time = 0.26, antiderivative size = 121, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2214, 2210}

$$\frac{b^3F^a\log^3(F)\text{Ei}\left(b(c+dx)^3\log(F)\right)}{18d}-\frac{b^2\log^2(F)F^{a+b(c+dx)^3}}{18d(c+dx)^3}-\frac{F^{a+b(c+dx)^3}}{9d(c+dx)^9}-\frac{b\log(F)F^{a+b(c+dx)^3}}{18d(c+dx)^6}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^3)/(c + d*x)^10,x]
```

```
[Out] -F^(a + b*(c + d*x)^3)/(9*d*(c + d*x)^9) - (b*F^(a + b*(c + d*x)^3)*Log[F])
/(18*d*(c + d*x)^6) - (b^2*F^(a + b*(c + d*x)^3)*Log[F]^2)/(18*d*(c + d*x)^
3) + (b^3*F^a*ExpIntegralEi[b*(c + d*x)^3*Log[F]]*Log[F]^3)/(18*d)
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^3}}{(c+dx)^{10}}\,dx = -\frac{F^{a+b(c+dx)^3}}{9d(c+dx)^9} + \frac{1}{3}(b\log(F))\int \frac{F^{a+b(c+dx)^3}}{(c+dx)^7}\,dx$$
$$= -\frac{F^{a+b(c+dx)^3}}{9d(c+dx)^9} - \frac{bF^{a+b(c+dx)^3}\log(F)}{18d(c+dx)^6} + \frac{1}{6}\left(b^2\log^2(F)\right)\int \frac{F^{a+b(c+dx)^3}}{(c+dx)^4}\,dx$$
$$= -\frac{F^{a+b(c+dx)^3}}{9d(c+dx)^9} - \frac{bF^{a+b(c+dx)^3}\log(F)}{18d(c+dx)^6} - \frac{b^2F^{a+b(c+dx)^3}\log^2(F)}{18d(c+dx)^3} + \frac{1}{6}\left(b^3\log^3(F)\right)\int \frac{F^{a+b(c+dx)^3}}{c+dx}\,dx$$
$$= -\frac{F^{a+b(c+dx)^3}}{9d(c+dx)^9} - \frac{bF^{a+b(c+dx)^3}\log(F)}{18d(c+dx)^6} - \frac{b^2F^{a+b(c+dx)^3}\log^2(F)}{18d(c+dx)^3} + \frac{b^3F^a\text{Ei}\left(b(c+dx)^3\log(F)\right)\log^3(}{18d}$$

Mathematica [A] time = 0.10, size = 80, normalized size = 0.66

$$\frac{F^a\left(b^3\log^3(F)\text{Ei}\left(b(c+dx)^3\log(F)\right) + \frac{F^{b(c+dx)^3}\left(-b^2\log^2(F)(c+dx)^6 - b\log(F)(c+dx)^3 - 2\right)}{(c+dx)^9}\right)}{18d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^3)/(c + d*x)^10,x]
```

```
[Out] (F^a*(b^3*ExpIntegralEi[b*(c + d*x)^3*Log[F]]*Log[F]^3 + (F^(b*(c + d*x)^3)
*(-2 - b*(c + d*x)^3*Log[F] - b^2*(c + d*x)^6*Log[F]^2))/(c + d*x)^9))/(18*
d)
```

fricas [B] time = 0.42, size = 431, normalized size = 3.56

$$\frac{\left(b^3d^9x^9 + 9\,b^3cd^8x^8 + 36\,b^3c^2d^7x^7 + 84\,b^3c^3d^6x^6 + 126\,b^3c^4d^5x^5 + 126\,b^3c^5d^4x^4 + 84\,b^3c^6d^3x^3 + 36\,b^3c^7d^2x^2 + 9}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c)^10,x, algorithm="fricas")
```

```
[Out] 1/18*((b^3*d^9*x^9 + 9*b^3*c*d^8*x^8 + 36*b^3*c^2*d^7*x^7 + 84*b^3*c^3*d^6*
x^6 + 126*b^3*c^4*d^5*x^5 + 126*b^3*c^5*d^4*x^4 + 84*b^3*c^6*d^3*x^3 + 36*b
^3*c^7*d^2*x^2 + 9*b^3*c^8*d*x + b^3*c^9)*F^a*Ei((b*d^3*x^3 + 3*b*c*d^2*x^2
 + 3*b*c^2*d*x + b*c^3)*log(F))*log(F)^3 - ((b^2*d^6*x^6 + 6*b^2*c*d^5*x^5
+ 15*b^2*c^2*d^4*x^4 + 20*b^2*c^3*d^3*x^3 + 15*b^2*c^4*d^2*x^2 + 6*b^2*c^5*
d*x + b^2*c^6)*log(F)^2 + (b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3)
*log(F) + 2)*F^(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a))/(d^10
*x^9 + 9*c*d^9*x^8 + 36*c^2*d^8*x^7 + 84*c^3*d^7*x^6 + 126*c^4*d^6*x^5 + 12
6*c^5*d^5*x^4 + 84*c^6*d^4*x^3 + 36*c^7*d^3*x^2 + 9*c^8*d^2*x + c^9*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^3b+a}}{(dx+c)^{10}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c)^10,x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^3*b + a)/(d*x + c)^10, x)
```

maple [F] time = 0.14, size = 0, normalized size = 0.00

$$\int \frac{F^{a+(dx+c)^3b}}{(dx+c)^{10}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+(d*x+c)^3*b)/(d*x+c)^10,x)
```

```
[Out] int(F^(a+(d*x+c)^3*b)/(d*x+c)^10,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^3b+a}}{(dx+c)^{10}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c)^10,x, algorithm="maxima")
```

```
[Out] integrate(F^((d*x + c)^3*b + a)/(d*x + c)^10, x)
```

mupad [B] time = 3.87, size = 104, normalized size = 0.86

$$-\frac{F^a\,b^3\,\ln(F)^3\,\mathrm{expint}\left(-b\,\ln(F)\,(c+d\,x)^3\right)}{18\,d}-\frac{F^a\,F^{b\,(c+d\,x)^3}\,b^3\,\ln(F)^3\,\left(\frac{1}{6\,b\,\ln(F)\,(c+d\,x)^3}+\frac{1}{6\,b^2\,\ln(F)^2\,(c+d\,x)^6}+\frac{1}{3\,b^3\,\ln(F)^3\,(c+d\,x)^9}\right)}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^3)/(c + d*x)^10,x)
```

```
[Out] - (F^a*b^3*log(F)^3*expint(-b*log(F)*(c + d*x)^3))/(18*d) - (F^a*F^(b*(c +
d*x)^3)*b^3*log(F)^3*(1/(6*b*log(F)*(c + d*x)^3) + 1/(6*b^2*log(F)^2*(c + d
*x)^6) + 1/(3*b^3*log(F)^3*(c + d*x)^9)))/(3*d)
```

<u>**sympy**</u> **[F(-1)]** time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**3)/(d*x+c)**10,x)
```

```
[Out] Timed out
```

3.291 $\int \frac{F^{a+b(c+dx)^3}}{(c+dx)^{13}} dx$

Optimal. Leaf size=31

$$-\frac{b^4F^a\log^4(F)\Gamma\left(-4,-b(c+dx)^3\log(F)\right)}{3d}$$

```
[Out] -1/3*F^a/(d*x+c)^12*Ei(5,-b*(d*x+c)^3*ln(F))/d
```

Rubi [A] time = 0.06, antiderivative size = 31, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2218}

$$-\frac{b^4F^a\log^4(F)\text{Gamma}\left(-4,-b\log(F)(c+dx)^3\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^3)/(c + d*x)^13,x]
```

```
[Out] -(b^4*F^a*Gamma[-4, -(b*(c + d*x)^3*Log[F])]*Log[F]^4)/(3*d)
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^3}}{(c+dx)^{13}} dx = -\frac{b^4F^a\Gamma\left(-4,-b(c+dx)^3\log(F)\right)\log^4(F)}{3d}$$

Mathematica [A] time = 0.01, size = 31, normalized size = 1.00

$$-\frac{b^4F^a\log^4(F)\Gamma\left(-4,-b(c+dx)^3\log(F)\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^3)/(c + d*x)^13,x]
```

```
[Out] -1/3*(b^4*F^a*Gamma[-4, -(b*(c + d*x)^3*Log[F])]*Log[F]^4)/d
```

fricas [B] time = 0.48, size = 636, normalized size = 20.52

$$\frac{\left(b^4 d^{12} x^{12} + 12\, b^4 c d^{11} x^{11} + 66\, b^4 c^2 d^{10} x^{10} + 220\, b^4 c^3 d^9 x^9 + 495\, b^4 c^4 d^8 x^8 + 792\, b^4 c^5 d^7 x^7 + 924\, b^4 c^6 d^6 x^6 + 792\, b^4}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c)^13,x, algorithm="fricas")
```

```
[Out] 1/72*((b^4*d^12*x^12 + 12*b^4*c*d^11*x^11 + 66*b^4*c^2*d^10*x^10 + 220*b^4*
c^3*d^9*x^9 + 495*b^4*c^4*d^8*x^8 + 792*b^4*c^5*d^7*x^7 + 924*b^4*c^6*d^6*x
^6 + 792*b^4*c^7*d^5*x^5 + 495*b^4*c^8*d^4*x^4 + 220*b^4*c^9*d^3*x^3 + 66*b
^4*c^10*d^2*x^2 + 12*b^4*c^11*d*x + b^4*c^12)*F^a*Ei((b*d^3*x^3 + 3*b*c*d^2
*x^2 + 3*b*c^2*d*x + b*c^3)*log(F))*log(F)^4 - ((b^3*d^9*x^9 + 9*b^3*c*d^8*
x^8 + 36*b^3*c^2*d^7*x^7 + 84*b^3*c^3*d^6*x^6 + 126*b^3*c^4*d^5*x^5 + 126*b
^3*c^5*d^4*x^4 + 84*b^3*c^6*d^3*x^3 + 36*b^3*c^7*d^2*x^2 + 9*b^3*c^8*d*x +
b^3*c^9)*log(F)^3 + (b^2*d^6*x^6 + 6*b^2*c*d^5*x^5 + 15*b^2*c^2*d^4*x^4 + 2
0*b^2*c^3*d^3*x^3 + 15*b^2*c^4*d^2*x^2 + 6*b^2*c^5*d*x + b^2*c^6)*log(F)^2
+ 2*(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3)*log(F) + 6)*F^(b*d^3*
x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a))/(d^13*x^12 + 12*c*d^12*x^11
 + 66*c^2*d^11*x^10 + 220*c^3*d^10*x^9 + 495*c^4*d^9*x^8 + 792*c^5*d^8*x^7
+ 924*c^6*d^7*x^6 + 792*c^7*d^6*x^5 + 495*c^8*d^5*x^4 + 220*c^9*d^4*x^3 + 6
6*c^10*d^3*x^2 + 12*c^11*d^2*x + c^12*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^3 b + a}}{(dx + c)^{13}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c)^13,x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^3*b + a)/(d*x + c)^13, x)
```

maple [F] time = 0.18, size = 0, normalized size = 0.00

$$\int \frac{F^{a + (dx+c)^3 b}}{(dx + c)^{13}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(F^(a+(d*x+c)^3*b)/(d*x+c)^13,x)

[Out] int(F^(a+(d*x+c)^3*b)/(d*x+c)^13,x)

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^3 b+a}}{(dx+c)^{13}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c)^13,x, algorithm="maxima")

[Out] integrate(F^((d*x + c)^3*b + a)/(d*x + c)^13, x)

mupad [B] time = 4.03, size = 120, normalized size = 3.87

$$-\frac{F^a\,b^4\ln(F)^4\,\mathrm{expint}\left(-b\,\ln(F)\,(c+d\,x)^3\right)}{72\,d}-\frac{F^a\,F^{b\,(c+d\,x)^3}\,b^4\ln(F)^4\,\left(\frac{1}{24\,b\,\ln(F)\,(c+d\,x)^3}+\frac{1}{24\,b^2\ln(F)^2\,(c+d\,x)^6}+\frac{1}{12\,b^3\ln(F)^3}\right.}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(F^(a + b*(c + d*x)^3)/(c + d*x)^13,x)

[Out] - (F^a*b^4*log(F)^4*expint(-b*log(F)*(c + d*x)^3))/(72*d) - (F^a*F^(b*(c + d*x)^3)*b^4*log(F)^4*(1/(24*b*log(F)*(c + d*x)^3) + 1/(24*b^2*log(F)^2*(c + d*x)^6) + 1/(12*b^3*log(F)^3*(c + d*x)^9) + 1/(4*b^4*log(F)^4*(c + d*x)^12)))/(3*d)

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F**(a+b*(d*x+c)**3)/(d*x+c)**13,x)

[Out] Timed out

3.292 $\int \frac{F^{a+b(c+dx)^3}}{(c+dx)^{16}} dx$

Optimal. Leaf size=31

$$\frac{b^5 F^a \log^5(F)\Gamma\left(-5,-b(c+dx)^3\log(F)\right)}{3d}$$

```
[Out] -1/3*F^a/(d*x+c)^15*Ei(6,-b*(d*x+c)^3*ln(F))/d
```

Rubi [A] time = 0.06, antiderivative size = 31, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2218}

$$\frac{b^5 F^a \log^5(F)\text{Gamma}\left(-5,-b\log(F)(c+dx)^3\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^3)/(c + d*x)^16,x]
```

```
[Out] (b^5*F^a*Gamma[-5, -(b*(c + d*x)^3*Log[F])]*Log[F]^5)/(3*d)
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^3}}{(c+dx)^{16}} dx = \frac{b^5 F^a \Gamma\left(-5,-b(c+dx)^3\log(F)\right)\log^5(F)}{3d}$$

Mathematica [A] time = 0.01, size = 31, normalized size = 1.00

$$\frac{b^5 F^a \log^5(F)\Gamma\left(-5,-b(c+dx)^3\log(F)\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^3)/(c + d*x)^16,x]
```

```
[Out] (b^5*F^a*Gamma[-5, -(b*(c + d*x)^3*Log[F])]*Log[F]^5)/(3*d)
```

fricas [B] time = 0.45, size = 883, normalized size = 28.48

$$\frac{\left(b^5d^{15}x^{15} + 15\,b^5cd^{14}x^{14} + 105\,b^5c^2d^{13}x^{13} + 455\,b^5c^3d^{12}x^{12} + 1365\,b^5c^4d^{11}x^{11} + 3003\,b^5c^5d^{10}x^{10} + 5005\,b^5c^6d^9\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c)^16,x, algorithm="fricas")
```

```
[Out] 1/360*((b^5*d^15*x^15 + 15*b^5*c*d^14*x^14 + 105*b^5*c^2*d^13*x^13 + 455*b^
5*c^3*d^12*x^12 + 1365*b^5*c^4*d^11*x^11 + 3003*b^5*c^5*d^10*x^10 + 5005*b^
5*c^6*d^9*x^9 + 6435*b^5*c^7*d^8*x^8 + 6435*b^5*c^8*d^7*x^7 + 5005*b^5*c^9*
d^6*x^6 + 3003*b^5*c^10*d^5*x^5 + 1365*b^5*c^11*d^4*x^4 + 455*b^5*c^12*d^3*
x^3 + 105*b^5*c^13*d^2*x^2 + 15*b^5*c^14*d*x + b^5*c^15)*F^a*Ei((b*d^3*x^3
+ 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3)*log(F))*log(F)^5 - ((b^4*d^12*x^12 +
 12*b^4*c*d^11*x^11 + 66*b^4*c^2*d^10*x^10 + 220*b^4*c^3*d^9*x^9 + 495*b^4*
c^4*d^8*x^8 + 792*b^4*c^5*d^7*x^7 + 924*b^4*c^6*d^6*x^6 + 792*b^4*c^7*d^5*x
^5 + 495*b^4*c^8*d^4*x^4 + 220*b^4*c^9*d^3*x^3 + 66*b^4*c^10*d^2*x^2 + 12*b
^4*c^11*d*x + b^4*c^12)*log(F)^4 + (b^3*d^9*x^9 + 9*b^3*c*d^8*x^8 + 36*b^3*
c^2*d^7*x^7 + 84*b^3*c^3*d^6*x^6 + 126*b^3*c^4*d^5*x^5 + 126*b^3*c^5*d^4*x^
4 + 84*b^3*c^6*d^3*x^3 + 36*b^3*c^7*d^2*x^2 + 9*b^3*c^8*d*x + b^3*c^9)*log(
F)^3 + 2*(b^2*d^6*x^6 + 6*b^2*c*d^5*x^5 + 15*b^2*c^2*d^4*x^4 + 20*b^2*c^3*d
^3*x^3 + 15*b^2*c^4*d^2*x^2 + 6*b^2*c^5*d*x + b^2*c^6)*log(F)^2 + 6*(b*d^3*
x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3)*log(F) + 24)*F^(b*d^3*x^3 + 3*b*
c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a))/(d^16*x^15 + 15*c*d^15*x^14 + 105*c^2
*d^14*x^13 + 455*c^3*d^13*x^12 + 1365*c^4*d^12*x^11 + 3003*c^5*d^11*x^10 +
5005*c^6*d^10*x^9 + 6435*c^7*d^9*x^8 + 6435*c^8*d^8*x^7 + 5005*c^9*d^7*x^6
+ 3003*c^10*d^6*x^5 + 1365*c^11*d^5*x^4 + 455*c^12*d^4*x^3 + 105*c^13*d^3*x
^2 + 15*c^14*d^2*x + c^15*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^3b+a}}{(dx+c)^{16}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c)^16,x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^3*b + a)/(d*x + c)^16, x)
```

maple [F] time = 0.24, size = 0, normalized size = 0.00

$$\int \frac{F^{a+(dx+c)^3 b}}{(dx+c)^{16}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+(d*x+c)^3*b)/(d*x+c)^16,x)
```

```
[Out] int(F^(a+(d*x+c)^3*b)/(d*x+c)^16,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^3 b+a}}{(dx+c)^{16}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c)^16,x, algorithm="maxima")
```

```
[Out] integrate(F^((d*x + c)^3*b + a)/(d*x + c)^16, x)
```

mupad [B] time = 4.30, size = 136, normalized size = 4.39

$$-\frac{F^a\,b^5\,\ln(F)^5\,\mathrm{expint}\left(-b\,\ln(F)\,(c+d\,x)^3\right)}{360\,d}-\frac{F^a\,F^{b\,(c+d\,x)^3}\,b^5\,\ln(F)^5\,\left(\frac{1}{120\,b\,\ln(F)\,(c+d\,x)^3}+\frac{1}{120\,b^2\,\ln(F)^2\,(c+d\,x)^6}+\frac{1}{60\,b^3\,\ln(F)^3}\right.}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^3)/(c + d*x)^16,x)
```

```
[Out] - (F^a*b^5*log(F)^5*expint(-b*log(F)*(c + d*x)^3))/(360*d) - (F^a*F^(b*(c +
 d*x)^3)*b^5*log(F)^5*(1/(120*b*log(F)*(c + d*x)^3) + 1/(120*b^2*log(F)^2*(
c + d*x)^6) + 1/(60*b^3*log(F)^3*(c + d*x)^9) + 1/(20*b^4*log(F)^4*(c + d*x
)^12) + 1/(5*b^5*log(F)^5*(c + d*x)^15)))/(3*d)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**3)/(d*x+c)**16,x)
```

```
[Out] Timed out
```

3.293 $\int F^{a+b(c+dx)^3}(c+dx)^3\,dx$

Optimal. Leaf size=49

$$-\frac{F^a(c+dx)^4\Gamma\left(\frac{4}{3},-b(c+dx)^3\log(F)\right)}{3d\left(-b\log(F)(c+dx)^3\right)^{4/3}}$$

```
[Out] -1/3*F^a*(d*x+c)^4*GAMMA(4/3,-b*(d*x+c)^3*ln(F))/d/(-b*(d*x+c)^3*ln(F))^(4/
3)
```

Rubi [A] time = 0.06, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2218}

$$-\frac{F^a(c+dx)^4\text{Gamma}\left(\frac{4}{3},-b\log(F)(c+dx)^3\right)}{3d\left(-b\log(F)(c+dx)^3\right)^{4/3}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^3)*(c + d*x)^3,x]
```

```
[Out] -(F^a*(c + d*x)^4*Gamma[4/3, -(b*(c + d*x)^3*Log[F])])/(3*d*(-(b*(c + d*x)^
3*Log[F]))^(4/3))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+b(c+dx)^3}(c+dx)^3\,dx=-\frac{F^a(c+dx)^4\Gamma\left(\frac{4}{3},-b(c+dx)^3\log(F)\right)}{3d\left(-b(c+dx)^3\log(F)\right)^{4/3}}$$

Mathematica [A] time = 0.03, size = 49, normalized size = 1.00

$$-\frac{F^a(c+dx)^4\Gamma\left(\frac{4}{3},-b(c+dx)^3\log(F)\right)}{3d\left(-b\log(F)(c+dx)^3\right)^{4/3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^3)*(c + d*x)^3,x]
```

```
[Out] -1/3*(F^a*(c + d*x)^4*Gamma[4/3, -(b*(c + d*x)^3*Log[F])])/(d*(-(b*(c + d*x
)^3*Log[F]))^(4/3))
```

fricas [B] time = 0.44, size = 118, normalized size = 2.41

$$\frac{3 \left(bd^3x + bcd^2\right)F^{bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a}\log(F) - \left(-bd^3\log(F)\right)^{\frac{2}{3}}F^a\Gamma\left(\frac{1}{3}, -\left(bd^3x^3 + 3\,bcd^2x^2 + 3\,bc^2dx + bc^3\right)\mathrm{lo}\right.}{9\,b^2d^3\log(F)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c)^3,x, algorithm="fricas")
```

```
[Out] 1/9*(3*(b*d^3*x + b*c*d^2)*F^(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c
^3 + a)*log(F) - (-b*d^3*log(F))^(2/3)*F^a*gamma(1/3, -(b*d^3*x^3 + 3*b*c*d
^2*x^2 + 3*b*c^2*d*x + b*c^3)*log(F)))/(b^2*d^3*log(F)^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)^3F^{(dx+c)^3b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c)^3,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^3*F^((d*x + c)^3*b + a), x)
```

maple [F] time = 0.09, size = 0, normalized size = 0.00

$$\int (dx+c)^3\,F^{a+(dx+c)^3b}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+(d*x+c)^3*b)*(d*x+c)^3,x)
```

```
[Out] int(F^(a+(d*x+c)^3*b)*(d*x+c)^3,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)^3F^{(dx+c)^3b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c)^3,x, algorithm="maxima")
```

```
[Out] integrate((d*x + c)^3*F^((d*x + c)^3*b + a), x)
```

mupad [B] time = 3.92, size = 112, normalized size = 2.29

$$\frac{F^a F^{b(c+dx)^3}(c+dx)}{3bd\ln(F)}-\frac{F^a\Gamma\left(\frac{1}{3},-b\ln(F)(c+dx)^3\right)(c+dx)^4}{9d\left(-b\ln(F)(c+dx)^3\right)^{4/3}}+\frac{2\pi\sqrt{3}F^a(c+dx)^4}{27d\Gamma\left(\frac{2}{3}\right)\left(-b\ln(F)(c+dx)^3\right)^{4/3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^3)*(c + d*x)^3,x)
```

```
[Out] (F^a*F^(b*(c + d*x)^3)*(c + d*x))/(3*b*d*log(F)) - (F^a*igamma(1/3, -b*log(
F)*(c + d*x)^3)*(c + d*x)^4)/(9*d*(-b*log(F)*(c + d*x)^3)^(4/3)) + (2*3^(1/
2)*F^a*pi*(c + d*x)^4)/(27*d*gamma(2/3)*(-b*log(F)*(c + d*x)^3)^(4/3))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+b(c+dx)^3}(c+dx)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**3)*(d*x+c)**3,x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**3)*(c + d*x)**3, x)
```

3.294 $\int F^{a+b(c+dx)^3}(c+dx)\,dx$

Optimal. Leaf size=49

$$-\frac{F^a(c+dx)^2\Gamma\left(\frac{2}{3},-b(c+dx)^3\log(F)\right)}{3d\left(-b\log(F)(c+dx)^3\right)^{2/3}}$$

```
[Out] -1/3*F^a*(d*x+c)^2*GAMMA(2/3,-b*(d*x+c)^3*ln(F))/d/(-b*(d*x+c)^3*ln(F))^(2/
3)
```

Rubi [A] time = 0.04, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.053, Rules used = {2218}

$$-\frac{F^a(c+dx)^2\text{Gamma}\left(\frac{2}{3},-b\log(F)(c+dx)^3\right)}{3d\left(-b\log(F)(c+dx)^3\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^3)*(c + d*x),x]
```

```
[Out] -(F^a*(c + d*x)^2*Gamma[2/3, -(b*(c + d*x)^3*Log[F])])/(3*d*(-(b*(c + d*x)^
3*Log[F]))^(2/3))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+b(c+dx)^3}(c+dx)\,dx=-\frac{F^a(c+dx)^2\Gamma\left(\frac{2}{3},-b(c+dx)^3\log(F)\right)}{3d\left(-b(c+dx)^3\log(F)\right)^{2/3}}$$

Mathematica [A] time = 0.02, size = 49, normalized size = 1.00

$$-\frac{F^a(c+dx)^2\Gamma\left(\frac{2}{3},-b(c+dx)^3\log(F)\right)}{3d\left(-b\log(F)(c+dx)^3\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^3)*(c + d*x),x]
```

```
[Out] -1/3*(F^a*(c + d*x)^2*Gamma[2/3, -(b*(c + d*x)^3*Log[F])])/(d*(-(b*(c + d*x
)^3*Log[F]))^(2/3))
```

fricas [A] time = 0.43, size = 63, normalized size = 1.29

$$\frac{\left(-bd^3\log(F)\right)^{\frac{1}{3}}F^a\Gamma\left(\frac{2}{3}, -\left(bd^3x^3 + 3\,bcd^2x^2 + 3\,bc^2dx + bc^3\right)\log(F)\right)}{3\,bd^2\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c),x, algorithm="fricas")
```

```
[Out] 1/3*(-b*d^3*log(F))^(1/3)*F^a*gamma(2/3, -(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*
c^2*d*x + b*c^3)*log(F))/(b*d^2*log(F))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)F^{(dx+c)^3b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c),x, algorithm="giac")
```

```
[Out] integrate((d*x + c)*F^((d*x + c)^3*b + a), x)
```

maple [F] time = 0.06, size = 0, normalized size = 0.00

$$\int (dx+c)\,F^{a+(dx+c)^3b}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+(d*x+c)^3*b)*(d*x+c),x)
```

```
[Out] int(F^(a+(d*x+c)^3*b)*(d*x+c),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)F^{(dx+c)^3b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)*(d*x+c),x, algorithm="maxima")
```

```
[Out] integrate((d*x + c)*F^((d*x + c)^3*b + a), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int F^{a+b\,(c+d\,x)^3}\,\left(c+d\,x\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^3)*(c + d*x),x)
```

```
[Out] int(F^(a + b*(c + d*x)^3)*(c + d*x), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+b(c+dx)^3}\left(c+dx\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**3)*(d*x+c),x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**3)*(c + d*x), x)
```

3.295 $\int F^{a+b(c+dx)^3}\,dx$

Optimal. Leaf size=47

$$-\frac{F^a(c+dx)\Gamma\left(\frac{1}{3},-b(c+dx)^3\log(F)\right)}{3d\sqrt[3]{-b\log(F)(c+dx)^3}}$$

```
[Out] -1/3*F^a*(d*x+c)*GAMMA(1/3,-b*(d*x+c)^3*ln(F))/d/(-b*(d*x+c)^3*ln(F))^(1/3)
```

Rubi [A] time = 0.01, antiderivative size = 47, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2208}

$$-\frac{F^a(c+dx)\text{Gamma}\left(\frac{1}{3},-b\log(F)(c+dx)^3\right)}{3d\sqrt[3]{-b\log(F)(c+dx)^3}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^3),x]
```

```
[Out] -(F^a*(c + d*x)*Gamma[1/3, -(b*(c + d*x)^3*Log[F])])/(3*d*(-(b*(c + d*x)^3*
Log[F]))^(1/3))
```

Rule 2208

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> -Simp[(F^a
*(c + d*x)*Gamma[1/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x)^n*Log[F
]))^(1/n)), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rubi steps

$$\int F^{a+b(c+dx)^3}\,dx=-\frac{F^a(c+dx)\Gamma\left(\frac{1}{3},-b(c+dx)^3\log(F)\right)}{3d\sqrt[3]{-b(c+dx)^3\log(F)}}$$

Mathematica [A] time = 0.02, size = 47, normalized size = 1.00

$$-\frac{F^a(c+dx)\Gamma\left(\frac{1}{3},-b(c+dx)^3\log(F)\right)}{3d\sqrt[3]{-b\log(F)(c+dx)^3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^3),x]
```

```
[Out] -1/3*(F^a*(c + d*x)*Gamma[1/3, -(b*(c + d*x)^3*Log[F])])/(d*(-(b*(c + d*x)^
3*Log[F]))^(1/3))
```

fricas [A] time = 0.45, size = 63, normalized size = 1.34

$$\frac{\left(-bd^{3}\log(F)\right)^{\frac{2}{3}} F^{a}\Gamma\left(\frac{1}{3}, -\left(bd^{3}x^{3}+3\,bcd^{2}x^{2}+3\,bc^{2}dx+bc^{3}\right)\log(F)\right)}{3\,bd^{3}\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3),x, algorithm="fricas")
```

```
[Out] 1/3*(-b*d^3*log(F))^(2/3)*F^a*gamma(1/3, -(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*
c^2*d*x + b*c^3)*log(F))/(b*d^3*log(F))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{(dx+c)^{3}b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3),x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^3*b + a), x)
```

maple [F] time = 0.04, size = 0, normalized size = 0.00

$$\int F^{a+(dx+c)^{3}b}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+(d*x+c)^3*b),x)
```

```
[Out] int(F^(a+(d*x+c)^3*b),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{(dx+c)^{3}b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3),x, algorithm="maxima")
```

```
[Out] integrate(F^((d*x + c)^3*b + a), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int F^{a+b\,{\left(c+d\,x\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^3),x)
```

```
[Out] int(F^(a + b*(c + d*x)^3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+b(c+dx)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**3),x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**3), x)
```

3.296 $\int \frac{F^{a+b(c+dx)^3}}{(c+dx)^2}\,dx$

Optimal. Leaf size=49

$$-\frac{F^a\sqrt[3]{-b\log(F)(c+dx)^3}\,\Gamma\left(-\frac{1}{3},-b(c+dx)^3\log(F)\right)}{3d(c+dx)}$$

```
[Out] -1/3*F^a*GAMMA(-1/3,-b*(d*x+c)^3*ln(F))*(-b*(d*x+c)^3*ln(F))^(1/3)/d/(d*x+c
)
```

Rubi [A] time = 0.06, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2218}

$$-\frac{F^a\sqrt[3]{-b\log(F)(c+dx)^3}\,\text{Gamma}\left(-\frac{1}{3},-b\log(F)(c+dx)^3\right)}{3d(c+dx)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^3)/(c + d*x)^2,x]
```

```
[Out] -(F^a*Gamma[-1/3, -(b*(c + d*x)^3*Log[F])]*(-(b*(c + d*x)^3*Log[F]))^(1/3))
/(3*d*(c + d*x))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^3}}{(c+dx)^2}\,dx = -\frac{F^a\Gamma\left(-\frac{1}{3},-b(c+dx)^3\log(F)\right)\sqrt[3]{-b(c+dx)^3\log(F)}}{3d(c+dx)}$$

Mathematica [A] time = 0.02, size = 49, normalized size = 1.00

$$-\frac{F^a\sqrt[3]{-b\log(F)(c+dx)^3}\,\Gamma\left(-\frac{1}{3},-b(c+dx)^3\log(F)\right)}{3d(c+dx)}$$

Antiderivative was successfully verified.

[In] Integrate[F^(a + b*(c + d*x)^3)/(c + d*x)^2,x]

[Out] -1/3*(F^a*Gamma[-1/3, -(b*(c + d*x)^3*Log[F])]*(-(b*(c + d*x)^3*Log[F]))^(1/3))/(d*(c + d*x))

fricas [B] time = 0.44, size = 110, normalized size = 2.24

$$\frac{\left(-bd^{3}\log(F)\right)^{\frac{1}{3}}(dx+c)F^{a}\Gamma\left(\frac{2}{3},-\left(bd^{3}x^{3}+3\,bcd^{2}x^{2}+3\,bc^{2}dx+bc^{3}\right)\log(F)\right)-F^{bd^{3}x^{3}+3\,bcd^{2}x^{2}+3\,bc^{2}dx+bc^{3}+a}d}{d^{3}x+cd^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c)^2,x, algorithm="fricas")

[Out] ((-b*d^3*log(F))^(1/3)*(d*x + c)*F^a*gamma(2/3, -(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3)*log(F)) - F^(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a)*d)/(d^3*x + c*d^2)

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^{3}b+a}}{(dx+c)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c)^2,x, algorithm="giac")

[Out] integrate(F^((d*x + c)^3*b + a)/(d*x + c)^2, x)

maple [F] time = 0.10, size = 0, normalized size = 0.00

$$\int \frac{F^{a+(dx+c)^{3}b}}{(dx+c)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(F^(a+(d*x+c)^3*b)/(d*x+c)^2,x)

[Out] int(F^(a+(d*x+c)^3*b)/(d*x+c)^2,x)

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^{3}b+a}}{(dx+c)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c)^2,x, algorithm="maxima")
```

```
[Out] integrate(F^((d*x + c)^3*b + a)/(d*x + c)^2, x)
```

mupad [B] time = 3.73, size = 74, normalized size = 1.51

$$-\frac{F^a\left(F^{b\,(c+d\,x)^3}-\Gamma\left(\frac{2}{3},-b\,\ln(F)\,(c+d\,x)^3\right)\left(-b\,\ln(F)\,(c+d\,x)^3\right)^{1/3}+\Gamma\left(\frac{2}{3}\right)\left(-b\,\ln(F)\,(c+d\,x)^3\right)^{1/3}\right)}{d\,(c+d\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^3)/(c + d*x)^2,x)
```

```
[Out] -(F^a*(F^(b*(c + d*x)^3) - igamma(2/3, -b*log(F)*(c + d*x)^3)*(-b*log(F)*(c
 + d*x)^3)^(1/3) + gamma(2/3)*(-b*log(F)*(c + d*x)^3)^(1/3)))/(d*(c + d*x))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b(c+dx)^3}}{(c+dx)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**3)/(d*x+c)**2,x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**3)/(c + d*x)**2, x)
```

3.297 $\int \frac{F^{a+b(c+dx)^3}}{(c+dx)^3}\,dx$

Optimal. Leaf size=49

$$-\frac{F^a\left(-b\log(F)(c+dx)^3\right)^{2/3}\Gamma\left(-\frac{2}{3},-b(c+dx)^3\log(F)\right)}{3d(c+dx)^2}$$

```
[Out] -1/3*F^a*GAMMA(-2/3,-b*(d*x+c)^3*ln(F))*(-b*(d*x+c)^3*ln(F))^(2/3)/d/(d*x+c
)^2
```

Rubi [A] time = 0.06, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2218}

$$-\frac{F^a\left(-b\log(F)(c+dx)^3\right)^{2/3}\text{Gamma}\left(-\frac{2}{3},-b\log(F)(c+dx)^3\right)}{3d(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^3)/(c + d*x)^3,x]
```

```
[Out] -(F^a*Gamma[-2/3, -(b*(c + d*x)^3*Log[F])]*(-(b*(c + d*x)^3*Log[F]))^(2/3))
/(3*d*(c + d*x)^2)
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^3}}{(c+dx)^3}\,dx=-\frac{F^a\Gamma\left(-\frac{2}{3},-b(c+dx)^3\log(F)\right)\left(-b(c+dx)^3\log(F)\right)^{2/3}}{3d(c+dx)^2}$$

Mathematica [A] time = 0.02, size = 49, normalized size = 1.00

$$-\frac{F^a\left(-b\log(F)(c+dx)^3\right)^{2/3}\Gamma\left(-\frac{2}{3},-b(c+dx)^3\log(F)\right)}{3d(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^3)/(c + d*x)^3,x]
```

```
[Out] -1/3*(F^a*Gamma[-2/3, -(b*(c + d*x)^3*Log[F])]*(-(b*(c + d*x)^3*Log[F]))^(2
/3))/(d*(c + d*x)^2)
```

fricas [B] time = 0.43, size = 135, normalized size = 2.76

$$\frac{\left(-bd^3\log(F)\right)^{\frac{2}{3}}\left(d^2x^2+2\,cdx+c^2\right)F^a\Gamma\left(\frac{1}{3},-\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3\right)\log(F)\right)-F^{bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3}}{2\left(d^5x^2+2\,cd^4x+c^2d^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c)^3,x, algorithm="fricas")
```

```
[Out] 1/2*((-b*d^3*log(F))^(2/3)*(d^2*x^2 + 2*c*d*x + c^2)*F^a*gamma(1/3, -(b*d^3
*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3)*log(F)) - F^(b*d^3*x^3 + 3*b*c*
d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a)*d^2)/(d^5*x^2 + 2*c*d^4*x + c^2*d^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^3b+a}}{(dx+c)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c)^3,x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^3*b + a)/(d*x + c)^3, x)
```

maple [F] time = 0.09, size = 0, normalized size = 0.00

$$\int \frac{F^{a+(dx+c)^3b}}{(dx+c)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+(d*x+c)^3*b)/(d*x+c)^3,x)
```

```
[Out] int(F^(a+(d*x+c)^3*b)/(d*x+c)^3,x)
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c)^3,x, algorithm="maxima")

[Out] Timed out

mupad [B] time = 3.83, size = 87, normalized size = 1.78

$$-\frac{F^a\left(3\,F^{b\,(c+d\,x)^3}\,\Gamma\left(\frac{2}{3}\right)-3\,\Gamma\left(\frac{2}{3}\right)\,\Gamma\left(\frac{1}{3},-b\,\ln(F)\,(c+d\,x)^3\right)\right)\left(-b\,\ln(F)\,(c+d\,x)^3\right)^{2/3}+2\,\pi\,\sqrt{3}\,\left(-b\,\ln(F)\,(c+d\,x)^3\right.}{6\,d\,\Gamma\left(\frac{2}{3}\right)\,(c+d\,x)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(F^(a + b*(c + d*x)^3)/(c + d*x)^3,x)

[Out] -(F^a*(3*F^(b*(c + d*x)^3)*gamma(2/3) - 3*gamma(2/3)*igamma(1/3, -b*log(F)*(c + d*x)^3)*(-b*log(F)*(c + d*x)^3)^(2/3) + 2*3^(1/2)*pi*(-b*log(F)*(c + d*x)^3)^(2/3)))/(6*d*gamma(2/3)*(c + d*x)^2)

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b(c+dx)^3}}{(c+dx)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F**(a+b*(d*x+c)**3)/(d*x+c)**3,x)

[Out] Integral(F**(a + b*(c + d*x)**3)/(c + d*x)**3, x)

3.298 $\int \frac{F^{a+b(c+dx)^3}}{(c+dx)^5}\,dx$

Optimal. Leaf size=49

$$-\frac{F^a\left(-b\log(F)(c+dx)^3\right)^{4/3}\Gamma\left(-\frac{4}{3},-b(c+dx)^3\log(F)\right)}{3d(c+dx)^4}$$

```
[Out] -1/3*F^a*GAMMA(-4/3,-b*(d*x+c)^3*ln(F))*(-b*(d*x+c)^3*ln(F))^(4/3)/d/(d*x+c
)^4
```

Rubi [A] time = 0.06, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2218}

$$-\frac{F^a\left(-b\log(F)(c+dx)^3\right)^{4/3}\text{Gamma}\left(-\frac{4}{3},-b\log(F)(c+dx)^3\right)}{3d(c+dx)^4}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^3)/(c + d*x)^5,x]
```

```
[Out] -(F^a*Gamma[-4/3, -(b*(c + d*x)^3*Log[F])]*(-(b*(c + d*x)^3*Log[F]))^(4/3))
/(3*d*(c + d*x)^4)
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^3}}{(c+dx)^5}\,dx=-\frac{F^a\Gamma\left(-\frac{4}{3},-b(c+dx)^3\log(F)\right)\left(-b(c+dx)^3\log(F)\right)^{4/3}}{3d(c+dx)^4}$$

Mathematica [A] time = 0.02, size = 49, normalized size = 1.00

$$-\frac{F^a\left(-b\log(F)(c+dx)^3\right)^{4/3}\Gamma\left(-\frac{4}{3},-b(c+dx)^3\log(F)\right)}{3d(c+dx)^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^3)/(c + d*x)^5,x]
```

```
[Out] -1/3*(F^a*Gamma[-4/3, -(b*(c + d*x)^3*Log[F])]*(-(b*(c + d*x)^3*Log[F]))^(4
/3))/(d*(c + d*x)^4)
```

fricas [B] time = 0.45, size = 226, normalized size = 4.61

$$\frac{3\left(bd^4x^4+4\,bcd^3x^3+6\,bc^2d^2x^2+4\,bc^3dx+bc^4\right)\left(-bd^3\log(F)\right)^{\frac{1}{3}}F^a\Gamma\left(\frac{2}{3},-\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3\right)\log(F)\right)\log(F)-\ldots}{4\left(d^6x^4+4\,cd^5x^3+6\,c^2d^4x^2+4\ldots\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c)^5,x, algorithm="fricas")
```

```
[Out] 1/4*(3*(b*d^4*x^4 + 4*b*c*d^3*x^3 + 6*b*c^2*d^2*x^2 + 4*b*c^3*d*x + b*c^4)*
(-b*d^3*log(F))^(1/3)*F^a*gamma(2/3, -(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*
d*x + b*c^3)*log(F))*log(F) - (3*(b*d^4*x^3 + 3*b*c*d^3*x^2 + 3*b*c^2*d^2*x
 + b*c^3*d)*log(F) + d)*F^(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3
+ a))/(d^6*x^4 + 4*c*d^5*x^3 + 6*c^2*d^4*x^2 + 4*c^3*d^3*x + c^4*d^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^3b+a}}{(dx+c)^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c)^5,x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^3*b + a)/(d*x + c)^5, x)
```

maple [F] time = 0.10, size = 0, normalized size = 0.00

$$\int \frac{F^{a+(dx+c)^3b}}{(dx+c)^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+(d*x+c)^3*b)/(d*x+c)^5,x)
```

```
[Out] int(F^(a+(d*x+c)^3*b)/(d*x+c)^5,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^3b+a}}{(dx+c)^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^3)/(d*x+c)^5,x, algorithm="maxima")
```

```
[Out] integrate(F^((d*x + c)^3*b + a)/(d*x + c)^5, x)
```

mupad [B] time = 4.47, size = 130, normalized size = 2.65

$$\frac{3\,F^a\,\Gamma\left(\frac{2}{3}\right)\,\left(-b\,\ln(F)\,(c+d\,x)^3\right)^{4/3}}{4\,d\,(c+d\,x)^4}-\frac{F^a\,F^{b\,(c+d\,x)^3}}{4\,d\,(c+d\,x)^4}-\frac{3\,F^a\,\Gamma\left(\frac{2}{3},-b\,\ln(F)\,(c+d\,x)^3\right)\,\left(-b\,\ln(F)\,(c+d\,x)^3\right)^{4/3}}{4\,d\,(c+d\,x)^4}-\frac{3\,F^a\,F^b}{4\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^3)/(c + d*x)^5,x)
```

```
[Out] (3*F^a*gamma(2/3)*(-b*log(F)*(c + d*x)^3)^(4/3))/(4*d*(c + d*x)^4) - (F^a*F
^(b*(c + d*x)^3))/(4*d*(c + d*x)^4) - (3*F^a*igamma(2/3, -b*log(F)*(c + d*x
)^3)*(-b*log(F)*(c + d*x)^3)^(4/3))/(4*d*(c + d*x)^4) - (3*F^a*F^(b*(c + d*
x)^3)*b*log(F))/(4*d*(c + d*x))
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**3)/(d*x+c)**5,x)
```

```
[Out] Timed out
```

3.299 $\int f^{a+b\sqrt{c+dx}}\,dx$

Optimal. Leaf size=64

$$\frac{2\sqrt{c+dx}\,f^{a+b\sqrt{c+dx}}}{bd\log(f)}-\frac{2f^{a+b\sqrt{c+dx}}}{b^2d\log^2(f)}$$

```
[Out] -2*f^(a+b*(d*x+c)^(1/2))/b^2/d/ln(f)^2+2*f^(a+b*(d*x+c)^(1/2))*(d*x+c)^(1/2
)/b/d/ln(f)
```

Rubi [A] time = 0.03, antiderivative size = 64, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2207, 2176, 2194}

$$\frac{2\sqrt{c+dx}\,f^{a+b\sqrt{c+dx}}}{bd\log(f)}-\frac{2f^{a+b\sqrt{c+dx}}}{b^2d\log^2(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*Sqrt[c + d*x]),x]
```

```
[Out] (-2*f^(a + b*Sqrt[c + d*x]))/(b^2*d*Log[f]^2) + (2*f^(a + b*Sqrt[c + d*x])*
Sqrt[c + d*x])/(b*d*Log[f])
```

Rule 2176

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_.), x_Symbol] :> Simp[((c + d*x)^m*(b*F^(g*(e + f*x)))^n)/(f*g*n*Log[F]),
x] - Dist[(d*m)/(f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*(b*F^(g*(e + f*x)))^n
, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && GtQ[m, 0] && IntegerQ[2*m
] &&  !$UseGamma === True
```

Rule 2194

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 2207

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> With[{k =
Denominator[n]}, Dist[k/d, Subst[Int[x^(k - 1)*F^(a + b*x^(k*n)), x], x, (c
 + d*x)^(1/k)], x]] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] &&  !Inte
gerQ[n]
```

Rubi steps

$$\int f^{a+b\sqrt{c+dx}}\,dx = \frac{2\,\text{Subst}\left(\int f^{a+bx}x\,dx, x, \sqrt{c+dx}\right)}{d}$$
$$= \frac{2f^{a+b\sqrt{c+dx}}\sqrt{c+dx}}{bd\log(f)} - \frac{2\,\text{Subst}\left(\int f^{a+bx}\,dx, x, \sqrt{c+dx}\right)}{bd\log(f)}$$
$$= -\frac{2f^{a+b\sqrt{c+dx}}}{b^2d\log^2(f)} + \frac{2f^{a+b\sqrt{c+dx}}\sqrt{c+dx}}{bd\log(f)}$$

Mathematica [A] time = 0.03, size = 42, normalized size = 0.66

$$\frac{2f^{a+b\sqrt{c+dx}}\left(b\log(f)\sqrt{c+dx}-1\right)}{b^2d\log^2(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*Sqrt[c + d*x]),x]
[Out] (2*f^(a + b*Sqrt[c + d*x])*(-1 + b*Sqrt[c + d*x]*Log[f]))/(b^2*d*Log[f]^2)
```

fricas [A] time = 0.41, size = 42, normalized size = 0.66

$$\frac{2\left(\sqrt{dx+c}\,b\log(f)-1\right)e^{\left(\sqrt{dx+c}\,b\log(f)+a\log(f)\right)}}{b^2d\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*(d*x+c)^(1/2)),x, algorithm="fricas")
[Out] 2*(sqrt(d*x + c)*b*log(f) - 1)*e^(sqrt(d*x + c)*b*log(f) + a*log(f))/(b^2*d
*log(f)^2)
```

giac [B] time = 0.40, size = 774, normalized size = 12.09

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*(d*x+c)^(1/2)),x, algorithm="giac")
[Out] (2*(2*((pi*b^2*log(abs(f))*sgn(f) - pi*b^2*log(abs(f)))*(pi*sqrt(d*x + c)*b
*sgn(f) - pi*sqrt(d*x + c)*b)/((pi^2*b^2*sgn(f) - pi^2*b^2 + 2*b^2*log(abs(
f))^2)^2 + 4*(pi*b^2*log(abs(f))*sgn(f) - pi*b^2*log(abs(f)))^2) + (pi^2*b^
```

```
2*sgn(f) - pi^2*b^2 + 2*b^2*log(abs(f))^2)*(sqrt(d*x + c)*b*log(abs(f)) - 1
)/((pi^2*b^2*sgn(f) - pi^2*b^2 + 2*b^2*log(abs(f))^2)^2 + 4*(pi*b^2*log(abs
(f))*sgn(f) - pi*b^2*log(abs(f)))^2))*cos(-1/2*pi*sqrt(d*x + c)*b*sgn(f) -
1/2*pi*a*sgn(f) + 1/2*pi*sqrt(d*x + c)*b + 1/2*pi*a) + ((pi^2*b^2*sgn(f) -
pi^2*b^2 + 2*b^2*log(abs(f))^2)*(pi*sqrt(d*x + c)*b*sgn(f) - pi*sqrt(d*x +
c)*b)/((pi^2*b^2*sgn(f) - pi^2*b^2 + 2*b^2*log(abs(f))^2)^2 + 4*(pi*b^2*log
(abs(f))*sgn(f) - pi*b^2*log(abs(f)))^2) - 4*(pi*b^2*log(abs(f))*sgn(f) - p
i*b^2*log(abs(f)))*(sqrt(d*x + c)*b*log(abs(f)) - 1)/((pi^2*b^2*sgn(f) - pi
^2*b^2 + 2*b^2*log(abs(f))^2)^2 + 4*(pi*b^2*log(abs(f))*sgn(f) - pi*b^2*log
(abs(f)))^2))*sin(-1/2*pi*sqrt(d*x + c)*b*sgn(f) - 1/2*pi*a*sgn(f) + 1/2*pi
*sqrt(d*x + c)*b + 1/2*pi*a))*e^(sqrt(d*x + c)*b*log(abs(f)) + a*log(abs(f)
)) - ((2*sqrt(d*x + c)*b*i*log(abs(f)) - pi*sqrt(d*x + c)*b*sgn(f) + pi*sqr
t(d*x + c)*b - 2*i)*e^(1/2*(pi*sqrt(d*x + c)*b*(sgn(f) - 1) + pi*a*(sgn(f)
- 1))*i)/(2*pi*b^2*i*log(abs(f))*sgn(f) - 2*pi*b^2*i*log(abs(f)) + pi^2*b^2
*sgn(f) - pi^2*b^2 + 2*b^2*log(abs(f))^2) + (2*sqrt(d*x + c)*b*i*log(abs(f)
) + pi*sqrt(d*x + c)*b*sgn(f) - pi*sqrt(d*x + c)*b - 2*i)*e^(-1/2*(pi*sqrt(
d*x + c)*b*(sgn(f) - 1) + pi*a*(sgn(f) - 1))*i)/(2*pi*b^2*i*log(abs(f))*sgn
(f) - 2*pi*b^2*i*log(abs(f)) - pi^2*b^2*sgn(f) + pi^2*b^2 - 2*b^2*log(abs(f
))^2))*e^(sqrt(d*x + c)*b*log(abs(f)) + a*log(abs(f)))/i)/d
```

maple [F] time = 0.01, size = 0, normalized size = 0.00

$$\int f^{a+\sqrt{dx+c}\,b}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+(d*x+c)^(1/2)*b),x)
```

```
[Out] int(f^(a+(d*x+c)^(1/2)*b),x)
```

maxima [A] time = 0.64, size = 43, normalized size = 0.67

$$\frac{2\left(\sqrt{dx+c}\,bf^a\log(f)-f^a\right)f^{\sqrt{dx+c}\,b}}{b^2d\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*(d*x+c)^(1/2)),x, algorithm="maxima")
```

```
[Out] 2*(sqrt(d*x + c)*b*f^a*log(f) - f^a)*f^(sqrt(d*x + c)*b)/(b^2*d*log(f)^2)
```

mupad [B] time = 3.60, size = 38, normalized size = 0.59

$$\frac{f^{a+b\sqrt{c+d\,x}}\,\left(2\,b\,\ln(f)\,\sqrt{c+d\,x}\,-2\right)}{b^2\,d\ln(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*(c + d*x)^(1/2)),x)
```

```
[Out] (f^(a + b*(c + d*x)^(1/2))*(2*b*log(f)*(c + d*x)^(1/2) - 2))/(b^2*d*log(f)^
2)
```

sympy [A] time = 0.72, size = 76, normalized size = 1.19

$$\begin{cases} x & \text{for}\: b = 0 \wedge d = 0 \wedge f = 1 \\ f^{a + b \sqrt{c}} x & \text{for}\: d = 0 \\ f^{a} x & \text{for}\: b = 0 \\ x & \text{for}\: f = 1 \\ \frac{2 f^{a} f^{b \sqrt{c + d x}} \sqrt{c + d x}}{b d \log{\left(f \right)}} - \frac{2 f^{a} f^{b \sqrt{c + d x}}}{b^{2} d \log{\left(f \right)}^{2}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b*(d*x+c)**(1/2)),x)
```

```
[Out] Piecewise((x, Eq(b, 0) & Eq(d, 0) & Eq(f, 1)), (f**(a + b*sqrt(c))*x, Eq(d,
 0)), (f**a*x, Eq(b, 0)), (x, Eq(f, 1)), (2*f**a*f**(b*sqrt(c + d*x))*sqrt(
c + d*x)/(b*d*log(f)) - 2*f**a*f**(b*sqrt(c + d*x))/(b**2*d*log(f)**2), Tru
e))
```

3.300 $\int f^{a+b\sqrt[3]{c+dx}}\,dx$

Optimal. Leaf size=100

$$\frac{6f^{a+b\sqrt[3]{c+dx}}}{b^3d\log^3(f)}-\frac{6\sqrt[3]{c+dx}\,f^{a+b\sqrt[3]{c+dx}}}{b^2d\log^2(f)}+\frac{3(c+dx)^{2/3}f^{a+b\sqrt[3]{c+dx}}}{bd\log(f)}$$

```
[Out] 6*f^(a+b*(d*x+c)^(1/3))/b^3/d/ln(f)^3-6*f^(a+b*(d*x+c)^(1/3))*(d*x+c)^(1/3)
/b^2/d/ln(f)^2+3*f^(a+b*(d*x+c)^(1/3))*(d*x+c)^(2/3)/b/d/ln(f)
```

Rubi [A] time = 0.06, antiderivative size = 100, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2207, 2176, 2194}

$$-\frac{6\sqrt[3]{c+dx}\,f^{a+b\sqrt[3]{c+dx}}}{b^2d\log^2(f)}+\frac{6f^{a+b\sqrt[3]{c+dx}}}{b^3d\log^3(f)}+\frac{3(c+dx)^{2/3}f^{a+b\sqrt[3]{c+dx}}}{bd\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*(c + d*x)^(1/3)),x]
```

```
[Out] (6*f^(a + b*(c + d*x)^(1/3)))/(b^3*d*Log[f]^3) - (6*f^(a + b*(c + d*x)^(1/3
))*(c + d*x)^(1/3))/(b^2*d*Log[f]^2) + (3*f^(a + b*(c + d*x)^(1/3))*(c + d*
x)^(2/3))/(b*d*Log[f])
```

Rule 2176

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_.), x_Symbol] :> Simp[((c + d*x)^m*(b*F^(g*(e + f*x)))^n)/(f*g*n*Log[F]),
x] - Dist[(d*m)/(f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*(b*F^(g*(e + f*x)))^n
, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && GtQ[m, 0] && IntegerQ[2*m
] &&  !$UseGamma === True
```

Rule 2194

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 2207

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> With[{k =
Denominator[n]}, Dist[k/d, Subst[Int[x^(k - 1)*F^(a + b*x^(k*n)), x], x, (c
 + d*x)^(1/k)], x]] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] &&  !Inte
gerQ[n]
```

Rubi steps

$$\int f^{a+b\sqrt[3]{c+dx}}\,dx = \frac{3\,\text{Subst}\left(\int f^{a+bx}x^2\,dx,x,\sqrt[3]{c+dx}\right)}{d}$$
$$= \frac{3f^{a+b\sqrt[3]{c+dx}}(c+dx)^{2/3}}{bd\log(f)} - \frac{6\,\text{Subst}\left(\int f^{a+bx}x\,dx,x,\sqrt[3]{c+dx}\right)}{bd\log(f)}$$
$$= -\frac{6f^{a+b\sqrt[3]{c+dx}}\sqrt[3]{c+dx}}{b^2d\log^2(f)} + \frac{3f^{a+b\sqrt[3]{c+dx}}(c+dx)^{2/3}}{bd\log(f)} + \frac{6\,\text{Subst}\left(\int f^{a+bx}\,dx,x,\sqrt[3]{c+dx}\right)}{b^2d\log^2(f)}$$
$$= \frac{6f^{a+b\sqrt[3]{c+dx}}}{b^3d\log^3(f)} - \frac{6f^{a+b\sqrt[3]{c+dx}}\sqrt[3]{c+dx}}{b^2d\log^2(f)} + \frac{3f^{a+b\sqrt[3]{c+dx}}(c+dx)^{2/3}}{bd\log(f)}$$

Mathematica [A] time = 0.04, size = 60, normalized size = 0.60

$$\frac{3f^{a+b\sqrt[3]{c+dx}}\left(b^2\log^2(f)(c+dx)^{2/3} - 2b\log(f)\sqrt[3]{c+dx} + 2\right)}{b^3d\log^3(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*(c + d*x)^(1/3)),x]
```

```
[Out] (3*f^(a + b*(c + d*x)^(1/3))*(2 - 2*b*(c + d*x)^(1/3)*Log[f] + b^2*(c + d*x
)^(2/3)*Log[f]^2))/(b^3*d*Log[f]^3)
```

fricas [A] time = 0.42, size = 58, normalized size = 0.58

$$\frac{3\left((dx+c)^{\frac{2}{3}}b^2\log(f)^2 - 2\,(dx+c)^{\frac{1}{3}}b\log(f) + 2\right)e^{\left((dx+c)^{\frac{1}{3}}b\log(f)+a\log(f)\right)}}{b^3d\log(f)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*(d*x+c)^(1/3)),x, algorithm="fricas")
```

```
[Out] 3*((d*x + c)^(2/3)*b^2*log(f)^2 - 2*(d*x + c)^(1/3)*b*log(f) + 2)*e^((d*x +
 c)^(1/3)*b*log(f) + a*log(f))/(b^3*d*log(f)^3)
```

giac [B] time = 0.49, size = 1336, normalized size = 13.36

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*(d*x+c)^(1/3)),x, algorithm="giac")
```

```
[Out] 3/2*(2*(((3*pi^2*b^3*log(abs(f))*sgn(f) - 3*pi^2*b^3*log(abs(f)) + 2*b^3*lo
g(abs(f))^3)*(pi^2*(d*x + c)^(2/3)*b^2*sgn(f) - pi^2*(d*x + c)^(2/3)*b^2 +
2*(d*x + c)^(2/3)*b^2*log(abs(f))^2 - 4*(d*x + c)^(1/3)*b*log(abs(f)) + 4)/
((pi^3*b^3*sgn(f) - 3*pi*b^3*log(abs(f))^2*sgn(f) - pi^3*b^3 + 3*pi*b^3*log
(abs(f))^2)^2 + (3*pi^2*b^3*log(abs(f))*sgn(f) - 3*pi^2*b^3*log(abs(f)) + 2
*b^3*log(abs(f))^3)^2) - 2*(pi^3*b^3*sgn(f) - 3*pi*b^3*log(abs(f))^2*sgn(f)
 - pi^3*b^3 + 3*pi*b^3*log(abs(f))^2)*(pi*(d*x + c)^(2/3)*b^2*log(abs(f))*s
gn(f) - pi*(d*x + c)^(2/3)*b^2*log(abs(f)) - pi*(d*x + c)^(1/3)*b*sgn(f) +
pi*(d*x + c)^(1/3)*b)/((pi^3*b^3*sgn(f) - 3*pi*b^3*log(abs(f))^2*sgn(f) - p
i^3*b^3 + 3*pi*b^3*log(abs(f))^2)^2 + (3*pi^2*b^3*log(abs(f))*sgn(f) - 3*pi
^2*b^3*log(abs(f)) + 2*b^3*log(abs(f))^3)^2))*cos(-1/2*pi*(d*x + c)^(1/3)*b
*sgn(f) - 1/2*pi*a*sgn(f) + 1/2*pi*(d*x + c)^(1/3)*b + 1/2*pi*a) + ((pi^3*b
^3*sgn(f) - 3*pi*b^3*log(abs(f))^2*sgn(f) - pi^3*b^3 + 3*pi*b^3*log(abs(f))
^2)*(pi^2*(d*x + c)^(2/3)*b^2*sgn(f) - pi^2*(d*x + c)^(2/3)*b^2 + 2*(d*x +
c)^(2/3)*b^2*log(abs(f))^2 - 4*(d*x + c)^(1/3)*b*log(abs(f)) + 4)/((pi^3*b^
3*sgn(f) - 3*pi*b^3*log(abs(f))^2*sgn(f) - pi^3*b^3 + 3*pi*b^3*log(abs(f))^
2)^2 + (3*pi^2*b^3*log(abs(f))*sgn(f) - 3*pi^2*b^3*log(abs(f)) + 2*b^3*log(
abs(f))^3)^2) + 2*(3*pi^2*b^3*log(abs(f))*sgn(f) - 3*pi^2*b^3*log(abs(f)) +
 2*b^3*log(abs(f))^3)*(pi*(d*x + c)^(2/3)*b^2*log(abs(f))*sgn(f) - pi*(d*x
+ c)^(2/3)*b^2*log(abs(f)) - pi*(d*x + c)^(1/3)*b*sgn(f) + pi*(d*x + c)^(1/
3)*b)/((pi^3*b^3*sgn(f) - 3*pi*b^3*log(abs(f))^2*sgn(f) - pi^3*b^3 + 3*pi*b
^3*log(abs(f))^2)^2 + (3*pi^2*b^3*log(abs(f))*sgn(f) - 3*pi^2*b^3*log(abs(f
)) + 2*b^3*log(abs(f))^3)^2))*sin(-1/2*pi*(d*x + c)^(1/3)*b*sgn(f) - 1/2*pi
*a*sgn(f) + 1/2*pi*(d*x + c)^(1/3)*b + 1/2*pi*a))*e^((d*x + c)^(1/3)*b*log(
abs(f)) + a*log(abs(f))) + ((pi^2*(d*x + c)^(2/3)*b^2*i*sgn(f) - pi^2*(d*x
+ c)^(2/3)*b^2*i + 2*(d*x + c)^(2/3)*b^2*i*log(abs(f))^2 - 2*pi*(d*x + c)^(
2/3)*b^2*log(abs(f))*sgn(f) + 2*pi*(d*x + c)^(2/3)*b^2*log(abs(f)) - 4*(d*x
 + c)^(1/3)*b*i*log(abs(f)) + 2*pi*(d*x + c)^(1/3)*b*sgn(f) - 2*pi*(d*x + c
)^(1/3)*b + 4*i)*e^(1/2*(pi*(d*x + c)^(1/3)*b*(sgn(f) - 1) + pi*a*(sgn(f) -
 1))*i)/(pi^3*b^3*i*sgn(f) - 3*pi*b^3*i*log(abs(f))^2*sgn(f) - pi^3*b^3*i +
 3*pi*b^3*i*log(abs(f))^2 - 3*pi^2*b^3*log(abs(f))*sgn(f) + 3*pi^2*b^3*log(
abs(f)) - 2*b^3*log(abs(f))^3) + (pi^2*(d*x + c)^(2/3)*b^2*i*sgn(f) - pi^2*
(d*x + c)^(2/3)*b^2*i + 2*(d*x + c)^(2/3)*b^2*i*log(abs(f))^2 + 2*pi*(d*x +
 c)^(2/3)*b^2*log(abs(f))*sgn(f) - 2*pi*(d*x + c)^(2/3)*b^2*log(abs(f)) - 4
*(d*x + c)^(1/3)*b*i*log(abs(f)) - 2*pi*(d*x + c)^(1/3)*b*sgn(f) + 2*pi*(d*
x + c)^(1/3)*b + 4*i)*e^(-1/2*(pi*(d*x + c)^(1/3)*b*(sgn(f) - 1) + pi*a*(sg
n(f) - 1))*i)/(pi^3*b^3*i*sgn(f) - 3*pi*b^3*i*log(abs(f))^2*sgn(f) - pi^3*b
^3*i + 3*pi*b^3*i*log(abs(f))^2 + 3*pi^2*b^3*log(abs(f))*sgn(f) - 3*pi^2*b^
3*log(abs(f)) + 2*b^3*log(abs(f))^3))*e^((d*x + c)^(1/3)*b*log(abs(f)) + a*
log(abs(f)))/i)/d
```

maple [F] time = 0.01, size = 0, normalized size = 0.00

$$\int f^{a+(dx+c)^{\frac{1}{3}}b}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a+b*(d*x+c)^(1/3)),x)
```

```
[Out] int(f^(a+b*(d*x+c)^(1/3)),x)
```

maxima [A] time = 0.59, size = 62, normalized size = 0.62

$$\frac{3\left((dx+c)^{\frac{2}{3}}b^2f^a\log(f)^2-2\,(dx+c)^{\frac{1}{3}}bf^a\log(f)+2\,f^a\right)f^{(dx+c)^{\frac{1}{3}}b}}{b^3d\log(f)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*(d*x+c)^(1/3)),x, algorithm="maxima")
```

```
[Out] 3*((d*x + c)^(2/3)*b^2*f^a*log(f)^2 - 2*(d*x + c)^(1/3)*b*f^a*log(f) + 2*f^
a)*f^((d*x + c)^(1/3)*b)/(b^3*d*log(f)^3)
```

mupad [B] time = 3.58, size = 54, normalized size = 0.54

$$\frac{f^{a+b\,(c+d\,x)^{1/3}}\,\left(3\,b^2\,\ln(f)^2\,(c+d\,x)^{2/3}-6\,b\,\ln(f)\,(c+d\,x)^{1/3}+6\right)}{b^3\,d\,\ln(f)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*(c + d*x)^(1/3)),x)
```

```
[Out] (f^(a + b*(c + d*x)^(1/3))*(3*b^2*log(f)^2*(c + d*x)^(2/3) - 6*b*log(f)*(c
+ d*x)^(1/3) + 6))/(b^3*d*log(f)^3)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+b\sqrt[3]{c+dx}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b*(d*x+c)**(1/3)),x)
```

```
[Out] Integral(f**(a + b*(c + d*x)**(1/3)), x)
```

3.301 $\int F^{a+\frac{b}{c+dx}}(c+dx)^m\,dx$

Optimal. Leaf size=50

$$\frac{F^a(c+dx)^{m+1}\left(-\frac{b\log(F)}{c+dx}\right)^{m+1}\Gamma\left(-m-1,-\frac{b\log(F)}{c+dx}\right)}{d}$$

```
[Out] F^a*(d*x+c)^(1+m)*GAMMA(-1-m,-b*ln(F)/(d*x+c))*(-b*ln(F)/(d*x+c))^(1+m)/d
```

Rubi [A] time = 0.04, antiderivative size = 50, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2218}

$$\frac{F^a(c+dx)^{m+1}\left(-\frac{b\log(F)}{c+dx}\right)^{m+1}\text{Gamma}\left(-m-1,-\frac{b\log(F)}{c+dx}\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x))*(c + d*x)^m,x]
```

```
[Out] (F^a*(c + d*x)^(1 + m)*Gamma[-1 - m, -((b*Log[F])/(c + d*x))]*(-((b*Log[F])
/(c + d*x)))^(1 + m))/d
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+\frac{b}{c+dx}}(c+dx)^m\,dx=\frac{F^a(c+dx)^{1+m}\Gamma\left(-1-m,-\frac{b\log(F)}{c+dx}\right)\left(-\frac{b\log(F)}{c+dx}\right)^{1+m}}{d}$$

Mathematica [A] time = 0.02, size = 50, normalized size = 1.00

$$\frac{F^a(c+dx)^{m+1}\left(-\frac{b\log(F)}{c+dx}\right)^{m+1}\Gamma\left(-m-1,-\frac{b\log(F)}{c+dx}\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x))*(c + d*x)^m,x]
```

```
[Out] (F^a*(c + d*x)^(1 + m)*Gamma[-1 - m, -((b*Log[F])/(c + d*x))]*(-((b*Log[F])
/(c + d*x)))^(1 + m))/d
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left((dx+c)^m F^{\frac{adx+ac+b}{dx+c}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))*(d*x+c)^m,x, algorithm="fricas")
```

```
[Out] integral((d*x + c)^m*F^((a*d*x + a*c + b)/(d*x + c)), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)^m F^{a+\frac{b}{dx+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))*(d*x+c)^m,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^m*F^(a + b/(d*x + c)), x)
```

maple [F] time = 0.10, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{dx+c}}\,(dx+c)^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c))*(d*x+c)^m,x)
```

```
[Out] int(F^(a+b/(d*x+c))*(d*x+c)^m,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)^m F^{a+\frac{b}{dx+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))*(d*x+c)^m,x, algorithm="maxima")
```

```
[Out] integrate((d*x + c)^m*F^(a + b/(d*x + c)), x)
```

mupad [B] time = 3.67, size = 73, normalized size = 1.46

$$\frac{F^a\,\mathrm{e}^{\frac{b\,\ln(F)}{2\,(c+d\,x)}}\,(c+d\,x)^{m+1}\,\mathrm{M}_{\frac{m}{2}+1,-\frac{m}{2}-\frac{1}{2}}\left(\frac{b\,\ln(F)}{c+d\,x}\right)\left(\frac{b\,\ln(F)}{c+d\,x}\right)^{m/2}}{d\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x))*(c + d*x)^m,x)
```

```
[Out] (F^a*exp((b*log(F))/(2*(c + d*x)))*(c + d*x)^(m + 1)*whittakerM(m/2 + 1, -
m/2 - 1/2, (b*log(F))/(c + d*x))*((b*log(F))/(c + d*x))^(m/2))/(d*(m + 1))
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c))*(d*x+c)**m,x)
```

```
[Out] Timed out
```

3.302 $\int F^{a+\frac{b}{c+dx}}(c+dx)^4\,dx$

Optimal. Leaf size=29

$$-\frac{b^5F^a\log^5(F)\Gamma\left(-5,-\frac{b\log(F)}{c+dx}\right)}{d}$$

```
[Out] F^a*(d*x+c)^5*Ei(6,-b*ln(F)/(d*x+c))/d
```

Rubi [A] time = 0.04, antiderivative size = 29, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2218}

$$-\frac{b^5F^a\log^5(F)\text{Gamma}\left(-5,-\frac{b\log(F)}{c+dx}\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x))*(c + d*x)^4,x]
```

```
[Out] -((b^5*F^a*Gamma[-5, -((b*Log[F])/(c + d*x))]*Log[F]^5)/d)
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+\frac{b}{c+dx}}(c+dx)^4\,dx=-\frac{b^5F^a\Gamma\left(-5,-\frac{b\log(F)}{c+dx}\right)\log^5(F)}{d}$$

Mathematica [A] time = 0.01, size = 29, normalized size = 1.00

$$-\frac{b^5F^a\log^5(F)\Gamma\left(-5,-\frac{b\log(F)}{c+dx}\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x))*(c + d*x)^4,x]
```

```
[Out] -((b^5*F^a*Gamma[-5, -((b*Log[F])/(c + d*x))]*Log[F]^5)/d)
```

fricas [B] time = 0.43, size = 244, normalized size = 8.41

$$-\frac{F^{a}b^{5}\mathrm{Ei}\left(\frac{b\log(F)}{dx+c}\right)\log(F)^{5}-\left(24\,d^{5}x^{5}+120\,cd^{4}x^{4}+240\,c^{2}d^{3}x^{3}+240\,c^{3}d^{2}x^{2}+120\,c^{4}dx+24\,c^{5}+\left(b^{4}dx+b^{4}c\right)\mathrm{l}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))*(d*x+c)^4,x, algorithm="fricas")
```

```
[Out] -1/120*(F^a*b^5*Ei(b*log(F)/(d*x + c))*log(F)^5 - (24*d^5*x^5 + 120*c*d^4*x
^4 + 240*c^2*d^3*x^3 + 240*c^3*d^2*x^2 + 120*c^4*d*x + 24*c^5 + (b^4*d*x +
b^4*c)*log(F)^4 + (b^3*d^2*x^2 + 2*b^3*c*d*x + b^3*c^2)*log(F)^3 + 2*(b^2*d
^3*x^3 + 3*b^2*c*d^2*x^2 + 3*b^2*c^2*d*x + b^2*c^3)*log(F)^2 + 6*(b*d^4*x^4
 + 4*b*c*d^3*x^3 + 6*b*c^2*d^2*x^2 + 4*b*c^3*d*x + b*c^4)*log(F))*F^((a*d*x
 + a*c + b)/(d*x + c)))/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)^{4}F^{a+\frac{b}{dx+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))*(d*x+c)^4,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^4*F^(a + b/(d*x + c)), x)
```

maple [B] time = 0.14, size = 534, normalized size = 18.41

$$\frac{b^{5}F^{a}\,\mathrm{Ei}\left(1,-\frac{b\ln(F)}{dx+c}\right)\ln(F)^{5}}{120d}+\frac{b^{4}x\,F^{a}F^{\frac{b}{dx+c}}\ln(F)^{4}}{120}+\frac{b^{3}d\,x^{2}F^{a}F^{\frac{b}{dx+c}}\ln(F)^{3}}{120}+\frac{b^{2}d^{2}x^{3}F^{a}F^{\frac{b}{dx+c}}\ln(F)^{2}}{60}+\frac{b\,d^{3}x^{4}F^{a}F^{\frac{b}{dx+c}}\ln(F}{20}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)*b)*(d*x+c)^4,x)
```

```
[Out] 1/5*d^4*F^a*F^(1/(d*x+c)*b)*x^5+d^3*F^a*F^(1/(d*x+c)*b)*c*x^4+2*d^2*F^a*F^(
1/(d*x+c)*b)*c^2*x^3+2*d*F^a*F^(1/(d*x+c)*b)*c^3*x^2+F^a*F^(1/(d*x+c)*b)*c^
4*x+1/5/d*F^a*F^(1/(d*x+c)*b)*c^5+1/20*d^3*b*ln(F)*F^a*F^(1/(d*x+c)*b)*x^4+
1/5*d^2*b*ln(F)*F^a*F^(1/(d*x+c)*b)*c*x^3+3/10*d*b*ln(F)*F^a*F^(1/(d*x+c)*b
)*c^2*x^2+1/5*b*ln(F)*F^a*F^(1/(d*x+c)*b)*c^3*x+1/20/d*b*ln(F)*F^a*F^(1/(d*
x+c)*b)*c^4+1/60*d^2*b^2*ln(F)^2*F^a*F^(1/(d*x+c)*b)*x^3+1/20*d*b^2*ln(F)^2
```

```
*F^a*F^(1/(d*x+c)*b)*c*x^2+1/20*b^2*ln(F)^2*F^a*F^(1/(d*x+c)*b)*c^2*x+1/60/
d*b^2*ln(F)^2*F^a*F^(1/(d*x+c)*b)*c^3+1/120*d*b^3*ln(F)^3*F^a*F^(1/(d*x+c)*
b)*x^2+1/60*b^3*ln(F)^3*F^a*F^(1/(d*x+c)*b)*c*x+1/120/d*b^3*ln(F)^3*F^a*F^(
1/(d*x+c)*b)*c^2+1/120*b^4*ln(F)^4*F^a*F^(1/(d*x+c)*b)*x+1/120/d*b^4*ln(F)^
4*F^a*F^(1/(d*x+c)*b)*c+1/120/d*b^5*ln(F)^5*F^a*Ei(1,-b*ln(F)/(d*x+c))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{120}\left(24\,F^{a}d^{4}x^{5}+6\left(F^{a}bd^{3}\log(F)+20\,F^{a}cd^{3}\right)x^{4}+2\left(F^{a}b^{2}d^{2}\log(F)^{2}+12\,F^{a}bcd^{2}\log(F)+120\,F^{a}c^{2}d^{2}\right)x^{3}+\left(F^{a}b^{3}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))*(d*x+c)^4,x, algorithm="maxima")
```

```
[Out] 1/120*(24*F^a*d^4*x^5 + 6*(F^a*b*d^3*log(F) + 20*F^a*c*d^3)*x^4 + 2*(F^a*b^
2*d^2*log(F)^2 + 12*F^a*b*c*d^2*log(F) + 120*F^a*c^2*d^2)*x^3 + (F^a*b^3*d*
log(F)^3 + 6*F^a*b^2*c*d*log(F)^2 + 36*F^a*b*c^2*d*log(F) + 240*F^a*c^3*d)*
x^2 + (F^a*b^4*log(F)^4 + 2*F^a*b^3*c*log(F)^3 + 6*F^a*b^2*c^2*log(F)^2 + 2
4*F^a*b*c^3*log(F) + 120*F^a*c^4)*x)*F^(b/(d*x + c)) + integrate(1/120*(F^a
*b^5*d*x*log(F)^5 - F^a*b^4*c^2*log(F)^4 - 2*F^a*b^3*c^3*log(F)^3 - 6*F^a*b
^2*c^4*log(F)^2 - 24*F^a*b*c^5*log(F))*F^(b/(d*x + c))/(d^2*x^2 + 2*c*d*x +
 c^2), x)
```

mupad [B] time = 3.67, size = 181, normalized size = 6.24

$$\frac{F^{a}\,F^{\frac{b}{c+d\,x}}\,{\left(c+d\,x\right)}^{5}}{5\,d}+\frac{F^{a}\,b^{5}\,{\ln(F)}^{5}\,\mathrm{expint}\left(-\frac{b\,\ln(F)}{c+d\,x}\right)}{120\,d}+\frac{F^{a}\,F^{\frac{b}{c+d\,x}}\,b^{2}\,{\ln(F)}^{2}\,{\left(c+d\,x\right)}^{3}}{60\,d}+\frac{F^{a}\,F^{\frac{b}{c+d\,x}}\,b^{3}\,{\ln(F)}^{3}\,{\left(c+d\,x\right)}^{2}}{120\,d}+\frac{F^{a}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x))*(c + d*x)^4,x)
```

```
[Out] (F^a*F^(b/(c + d*x))*(c + d*x)^5)/(5*d) + (F^a*b^5*log(F)^5*expint(-(b*log(
F))/(c + d*x)))/(120*d) + (F^a*F^(b/(c + d*x))*b^2*log(F)^2*(c + d*x)^3)/(6
0*d) + (F^a*F^(b/(c + d*x))*b^3*log(F)^3*(c + d*x)^2)/(120*d) + (F^a*F^(b/(
c + d*x))*b*log(F)*(c + d*x)^4)/(20*d) + (F^a*F^(b/(c + d*x))*b^4*log(F)^4*
(c + d*x))/(120*d)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{c+dx}}\left(c+dx\right)^{4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c))*(d*x+c)**4,x)
```

```
[Out] Integral(F**(a + b/(c + d*x))*(c + d*x)**4, x)
```

3.303 $\int F^{a+\frac{b}{c+dx}}(c+dx)^3\,dx$

Optimal. Leaf size=28

$$\frac{b^4F^a\log^4(F)\Gamma\left(-4,-\frac{b\log(F)}{c+dx}\right)}{d}$$

```
[Out] F^a*(d*x+c)^4*Ei(5,-b*ln(F)/(d*x+c))/d
```

Rubi [A] time = 0.04, antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2218}

$$\frac{b^4F^a\log^4(F)\text{Gamma}\left(-4,-\frac{b\log(F)}{c+dx}\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x))*(c + d*x)^3,x]
```

```
[Out] (b^4*F^a*Gamma[-4, -((b*Log[F])/(c + d*x))]*Log[F]^4)/d
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+\frac{b}{c+dx}}(c+dx)^3\,dx=\frac{b^4F^a\Gamma\left(-4,-\frac{b\log(F)}{c+dx}\right)\log^4(F)}{d}$$

Mathematica [A] time = 0.01, size = 28, normalized size = 1.00

$$\frac{b^4F^a\log^4(F)\Gamma\left(-4,-\frac{b\log(F)}{c+dx}\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x))*(c + d*x)^3,x]
```

```
[Out] (b^4*F^a*Gamma[-4, -((b*Log[F])/(c + d*x))]*Log[F]^4)/d
```

fricas [B] time = 0.43, size = 175, normalized size = 6.25

$$-\frac{F^{a}b^{4}\mathrm{Ei}\left(\frac{b\log(F)}{dx+c}\right)\log(F)^{4}-\left(6\,d^{4}x^{4}+24\,cd^{3}x^{3}+36\,c^{2}d^{2}x^{2}+24\,c^{3}dx+6\,c^{4}+\left(b^{3}dx+b^{3}c\right)\log(F)^{3}+\left(b^{2}d^{2}x^{2}+\right.\right.}{24\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))*(d*x+c)^3,x, algorithm="fricas")
```

```
[Out] -1/24*(F^a*b^4*Ei(b*log(F)/(d*x + c))*log(F)^4 - (6*d^4*x^4 + 24*c*d^3*x^3
+ 36*c^2*d^2*x^2 + 24*c^3*d*x + 6*c^4 + (b^3*d*x + b^3*c)*log(F)^3 + (b^2*d
^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*log(F)^2 + 2*(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3
*b*c^2*d*x + b*c^3)*log(F))*F^((a*d*x + a*c + b)/(d*x + c)))/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)^{3}F^{a+\frac{b}{dx+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))*(d*x+c)^3,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^3*F^(a + b/(d*x + c)), x)
```

maple [B] time = 0.13, size = 368, normalized size = 13.14

$$\frac{b^{4}F^{a}\,\mathrm{Ei}\left(1,-\frac{b\ln(F)}{dx+c}\right)\ln(F)^{4}}{24d}+\frac{b^{3}x\,F^{a}F^{\frac{b}{dx+c}}\ln(F)^{3}}{24}+\frac{b^{2}d\,x^{2}F^{a}F^{\frac{b}{dx+c}}\ln(F)^{2}}{24}+\frac{b\,d^{2}x^{3}F^{a}F^{\frac{b}{dx+c}}\ln(F)}{12}+\frac{d^{3}x^{4}F^{a}F^{\frac{b}{dx+c}}}{4}+\frac{b^{3}c\,F^{\cdots}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)*b)*(d*x+c)^3,x)
```

```
[Out] 1/4*d^3*F^a*F^(1/(d*x+c)*b)*x^4+d^2*F^a*F^(1/(d*x+c)*b)*c*x^3+3/2*d*F^a*F^(
1/(d*x+c)*b)*c^2*x^2+F^a*F^(1/(d*x+c)*b)*c^3*x+1/4/d*F^a*F^(1/(d*x+c)*b)*c^
4+1/12*d^2*b*ln(F)*F^a*F^(1/(d*x+c)*b)*x^3+1/4*d*b*ln(F)*F^a*F^(1/(d*x+c)*b
)*c*x^2+1/4*b*ln(F)*F^a*F^(1/(d*x+c)*b)*c^2*x+1/12/d*b*ln(F)*F^a*F^(1/(d*x+
c)*b)*c^3+1/24*d*b^2*ln(F)^2*F^a*F^(1/(d*x+c)*b)*x^2+1/12*b^2*ln(F)^2*F^a*F
^(1/(d*x+c)*b)*c*x+1/24/d*b^2*ln(F)^2*F^a*F^(1/(d*x+c)*b)*c^2+1/24*b^3*ln(F
)^3*F^a*F^(1/(d*x+c)*b)*x+1/24/d*b^3*ln(F)^3*F^a*F^(1/(d*x+c)*b)*c+1/24/d*b
^4*ln(F)^4*F^a*Ei(1,-1/(d*x+c)*b*ln(F))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{24}\left(6\,F^{a}d^{3}x^{4}+2\left(F^{a}bd^{2}\log(F)+12\,F^{a}cd^{2}\right)x^{3}+\left(F^{a}b^{2}d\log(F)^{2}+6\,F^{a}bcd\log(F)+36\,F^{a}c^{2}d\right)x^{2}+\left(F^{a}b^{3}\log(F)^{3}+\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))*(d*x+c)^3,x, algorithm="maxima")
```

```
[Out] 1/24*(6*F^a*d^3*x^4 + 2*(F^a*b*d^2*log(F) + 12*F^a*c*d^2)*x^3 + (F^a*b^2*d*
log(F)^2 + 6*F^a*b*c*d*log(F) + 36*F^a*c^2*d)*x^2 + (F^a*b^3*log(F)^3 + 2*F
^a*b^2*c*log(F)^2 + 6*F^a*b*c^2*log(F) + 24*F^a*c^3)*x)*F^(b/(d*x + c)) + i
ntegrate(1/24*(F^a*b^4*d*x*log(F)^4 - F^a*b^3*c^2*log(F)^3 - 2*F^a*b^2*c^3*
log(F)^2 - 6*F^a*b*c^4*log(F))*F^(b/(d*x + c))/(d^2*x^2 + 2*c*d*x + c^2), x
)
```

mupad [B] time = 3.70, size = 148, normalized size = 5.29

$$\frac{F^{a}\,F^{\frac{b}{c+d\,x}}\,{(c+d\,x)}^{4}}{4\,d}+\frac{F^{a}\,b^{4}\,{\ln(F)}^{4}\,\mathrm{expint}\left(-\frac{b\,\ln(F)}{c+d\,x}\right)}{24\,d}+\frac{F^{a}\,F^{\frac{b}{c+d\,x}}\,b^{2}\,{\ln(F)}^{2}\,{(c+d\,x)}^{2}}{24\,d}+\frac{F^{a}\,F^{\frac{b}{c+d\,x}}\,b\,\ln(F)\,{(c+d\,x)}^{3}}{12\,d}+\frac{F^{a}\,F}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x))*(c + d*x)^3,x)
```

```
[Out] (F^a*F^(b/(c + d*x))*(c + d*x)^4)/(4*d) + (F^a*b^4*log(F)^4*expint(-(b*log(
F))/(c + d*x)))/(24*d) + (F^a*F^(b/(c + d*x))*b^2*log(F)^2*(c + d*x)^2)/(24
*d) + (F^a*F^(b/(c + d*x))*b*log(F)*(c + d*x)^3)/(12*d) + (F^a*F^(b/(c + d*
x))*b^3*log(F)^3*(c + d*x))/(24*d)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{c+dx}}\left(c+dx\right)^{3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c))*(d*x+c)**3,x)
```

```
[Out] Integral(F**(a + b/(c + d*x))*(c + d*x)**3, x)
```

3.304 $\int F^{a+\frac{b}{c+dx}}(c+dx)^2\,dx$

Optimal. Leaf size=119

$$-\frac{b^3F^a\log^3(F)\text{Ei}\left(\frac{b\log(F)}{c+dx}\right)}{6d}+\frac{b^2\log^2(F)(c+dx)F^{a+\frac{b}{c+dx}}}{6d}+\frac{(c+dx)^3F^{a+\frac{b}{c+dx}}}{3d}+\frac{b\log(F)(c+dx)^2F^{a+\frac{b}{c+dx}}}{6d}$$

```
[Out] 1/3*F^(a+b/(d*x+c))*(d*x+c)^3/d+1/6*b*F^(a+b/(d*x+c))*(d*x+c)^2*ln(F)/d+1/6
*b^2*F^(a+b/(d*x+c))*(d*x+c)*ln(F)^2/d-1/6*b^3*F^a*Ei(b*ln(F)/(d*x+c))*ln(F
)^3/d
```

Rubi [A] time = 0.13, antiderivative size = 119, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2214, 2206, 2210}

$$-\frac{b^3F^a\log^3(F)\text{Ei}\left(\frac{b\log(F)}{c+dx}\right)}{6d}+\frac{b^2\log^2(F)(c+dx)F^{a+\frac{b}{c+dx}}}{6d}+\frac{(c+dx)^3F^{a+\frac{b}{c+dx}}}{3d}+\frac{b\log(F)(c+dx)^2F^{a+\frac{b}{c+dx}}}{6d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x))*(c + d*x)^2,x]
```

```
[Out] (F^(a + b/(c + d*x))*(c + d*x)^3)/(3*d) + (b*F^(a + b/(c + d*x))*(c + d*x)^
2*Log[F])/(6*d) + (b^2*F^(a + b/(c + d*x))*(c + d*x)*Log[F]^2)/(6*d) - (b^3
*F^a*ExpIntegralEi[(b*Log[F])/(c + d*x)]*Log[F]^3)/(6*d)
```

Rule 2206

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[((c +
 d*x)*F^(a + b*(c + d*x)^n))/d, x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
```

```
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\begin{aligned}\int F^{a+\frac{b}{c+dx}}(c+dx)^2\,dx &= \frac{F^{a+\frac{b}{c+dx}}(c+dx)^3}{3d}+\frac{1}{3}(b\log(F))\int F^{a+\frac{b}{c+dx}}(c+dx)\,dx\\ &= \frac{F^{a+\frac{b}{c+dx}}(c+dx)^3}{3d}+\frac{bF^{a+\frac{b}{c+dx}}(c+dx)^2\log(F)}{6d}+\frac{1}{6}\left(b^2\log^2(F)\right)\int F^{a+\frac{b}{c+dx}}\,dx\\ &= \frac{F^{a+\frac{b}{c+dx}}(c+dx)^3}{3d}+\frac{bF^{a+\frac{b}{c+dx}}(c+dx)^2\log(F)}{6d}+\frac{b^2F^{a+\frac{b}{c+dx}}(c+dx)\log^2(F)}{6d}+\frac{1}{6}\left(b^3\log^3(F\right.\\ &= \frac{F^{a+\frac{b}{c+dx}}(c+dx)^3}{3d}+\frac{bF^{a+\frac{b}{c+dx}}(c+dx)^2\log(F)}{6d}+\frac{b^2F^{a+\frac{b}{c+dx}}(c+dx)\log^2(F)}{6d}-\frac{b^3F^a\text{Ei}\left(\frac{b\log}{c+d}\right.}{6d}\end{aligned}$$

Mathematica [A] time = 0.07, size = 76, normalized size = 0.64

$$\frac{F^a\left((c+dx)F^{\frac{b}{c+dx}}\left(b^2\log^2(F)+b\log(F)(c+dx)+2(c+dx)^2\right)-b^3\log^3(F)\text{Ei}\left(\frac{b\log(F)}{c+dx}\right)\right)}{6d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x))*(c + d*x)^2,x]
```

```
[Out] (F^a*(-(b^3*ExpIntegralEi[(b*Log[F])/(c + d*x)]*Log[F]^3) + F^(b/(c + d*x))
*(c + d*x)*(2*(c + d*x)^2 + b*(c + d*x)*Log[F] + b^2*Log[F]^2)))/(6*d)
```

fricas [A] time = 0.43, size = 120, normalized size = 1.01

$$-\frac{F^a b^3\text{Ei}\left(\frac{b\log(F)}{dx+c}\right)\log(F)^3-\left(2\,d^3x^3+6\,cd^2x^2+6\,c^2dx+2\,c^3+\left(b^2dx+b^2c\right)\log(F)^2+\left(bd^2x^2+2\,bcdx+bc^2\right)\log\right.}{6\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))*(d*x+c)^2,x, algorithm="fricas")
```

```
[Out] -1/6*(F^a*b^3*Ei(b*log(F)/(d*x + c))*log(F)^3 - (2*d^3*x^3 + 6*c*d^2*x^2 +
6*c^2*d*x + 2*c^3 + (b^2*d*x + b^2*c)*log(F)^2 + (b*d^2*x^2 + 2*b*c*d*x + b
*c^2)*log(F))*F^((a*d*x + a*c + b)/(d*x + c)))/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)^2 F^{a+\frac{b}{dx+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))*(d*x+c)^2,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^2*F^(a + b/(d*x + c)), x)
```

maple [B] time = 0.13, size = 234, normalized size = 1.97

$$\frac{b^3F^a \operatorname{Ei}\left(1,-\frac{b\ln(F)}{dx+c}\right)\ln(F)^3}{6d}+\frac{b^2x\,F^aF^{\frac{b}{dx+c}}\ln(F)^2}{6}+\frac{bd\,x^2F^aF^{\frac{b}{dx+c}}\ln(F)}{6}+\frac{d^2x^3F^aF^{\frac{b}{dx+c}}}{3}+\frac{b^2c\,F^aF^{\frac{b}{dx+c}}\ln(F)^2}{6d}+\frac{bcx\,F^aF^{\frac{b}{d}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)*b)*(d*x+c)^2,x)
```

```
[Out] 1/3*d^2*F^a*F^(1/(d*x+c)*b)*x^3+d*F^a*F^(1/(d*x+c)*b)*c*x^2+F^a*F^(1/(d*x+c
)*b)*c^2*x+1/3/d*F^a*F^(1/(d*x+c)*b)*c^3+1/6*d*b*ln(F)*F^a*F^(1/(d*x+c)*b)*
x^2+1/3*b*ln(F)*F^a*F^(1/(d*x+c)*b)*c*x+1/6/d*b*ln(F)*F^a*F^(1/(d*x+c)*b)*c
^2+1/6*b^2*ln(F)^2*F^a*F^(1/(d*x+c)*b)*x+1/6/d*b^2*ln(F)^2*F^a*F^(1/(d*x+c)
*b)*c+1/6/d*b^3*ln(F)^3*F^a*Ei(1,-1/(d*x+c)*b*ln(F))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{6}\left(2\,F^ad^2x^3+\left(F^abd\log(F)+6\,F^acd\right)x^2+\left(F^ab^2\log(F)^2+2\,F^abc\log(F)+6\,F^ac^2\right)x\right)F^{\frac{b}{dx+c}}+\int\frac{\left(F^ab^3dx\log(F)^3-\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))*(d*x+c)^2,x, algorithm="maxima")
```

```
[Out] 1/6*(2*F^a*d^2*x^3 + (F^a*b*d*log(F) + 6*F^a*c*d)*x^2 + (F^a*b^2*log(F)^2 +
 2*F^a*b*c*log(F) + 6*F^a*c^2)*x)*F^(b/(d*x + c)) + integrate(1/6*(F^a*b^3*
d*x*log(F)^3 - F^a*b^2*c^2*log(F)^2 - 2*F^a*b*c^3*log(F))*F^(b/(d*x + c))/(
d^2*x^2 + 2*c*d*x + c^2), x)
```

mupad [B] time = 3.88, size = 89, normalized size = 0.75

$$\frac{F^a\,b^3\ln(F)^3\left(\frac{\mathrm{expint}\left(-\frac{b\,\ln(F)}{c+d\,x}\right)}{6}+F^{\frac{b}{c+d\,x}}\left(\frac{c+d\,x}{6\,b\,\ln(F)}+\frac{{(c+d\,x)}^2}{6\,b^2\ln(F)^2}+\frac{{(c+d\,x)}^3}{3\,b^3\ln(F)^3}\right)\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x))*(c + d*x)^2,x)
```

```
[Out] (F^a*b^3*log(F)^3*(expint(-(b*log(F))/(c + d*x))/6 + F^(b/(c + d*x))*((c +
d*x)/(6*b*log(F)) + (c + d*x)^2/(6*b^2*log(F)^2) + (c + d*x)^3/(3*b^3*log(F
)^3))))/d
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{c+dx}}(c+dx)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c))*(d*x+c)**2,x)
```

```
[Out] Integral(F**(a + b/(c + d*x))*(c + d*x)**2, x)
```

3.305 $\int F^{a+\frac{b}{c+dx}}(c+dx)\,dx$

Optimal. Leaf size=85

$$-\frac{b^2F^a\log^2(F)\text{Ei}\left(\frac{b\log(F)}{c+dx}\right)}{2d}+\frac{(c+dx)^2F^{a+\frac{b}{c+dx}}}{2d}+\frac{b\log(F)(c+dx)F^{a+\frac{b}{c+dx}}}{2d}$$

```
[Out] 1/2*F^(a+b/(d*x+c))*(d*x+c)^2/d+1/2*b*F^(a+b/(d*x+c))*(d*x+c)*ln(F)/d-1/2*b
^2*F^a*Ei(b*ln(F)/(d*x+c))*ln(F)^2/d
```

Rubi [A] time = 0.08, antiderivative size = 85, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {2214, 2206, 2210}

$$-\frac{b^2F^a\log^2(F)\text{Ei}\left(\frac{b\log(F)}{c+dx}\right)}{2d}+\frac{(c+dx)^2F^{a+\frac{b}{c+dx}}}{2d}+\frac{b\log(F)(c+dx)F^{a+\frac{b}{c+dx}}}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x))*(c + d*x),x]
```

```
[Out] (F^(a + b/(c + d*x))*(c + d*x)^2)/(2*d) + (b*F^(a + b/(c + d*x))*(c + d*x)*
Log[F])/(2*d) - (b^2*F^a*ExpIntegralEi[(b*Log[F])/(c + d*x)]*Log[F]^2)/(2*d
)
```

Rule 2206

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[((c +
 d*x)*F^(a + b*(c + d*x)^n))/d, x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
```

```
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\begin{aligned}\int F^{a+\frac{b}{c+dx}}(c+dx)\,dx &= \frac{F^{a+\frac{b}{c+dx}}(c+dx)^2}{2d}+\frac{1}{2}(b\log(F))\int F^{a+\frac{b}{c+dx}}\,dx\\ &= \frac{F^{a+\frac{b}{c+dx}}(c+dx)^2}{2d}+\frac{bF^{a+\frac{b}{c+dx}}(c+dx)\log(F)}{2d}+\frac{1}{2}\left(b^2\log^2(F)\right)\int\frac{F^{a+\frac{b}{c+dx}}}{c+dx}\,dx\\ &= \frac{F^{a+\frac{b}{c+dx}}(c+dx)^2}{2d}+\frac{bF^{a+\frac{b}{c+dx}}(c+dx)\log(F)}{2d}-\frac{b^2F^a\mathrm{Ei}\left(\frac{b\log(F)}{c+dx}\right)\log^2(F)}{2d}\end{aligned}$$

Mathematica [A] time = 0.05, size = 58, normalized size = 0.68

$$\frac{F^a\left((c+dx)F^{\frac{b}{c+dx}}(b\log(F)+c+dx)-b^2\log^2(F)\mathrm{Ei}\left(\frac{b\log(F)}{c+dx}\right)\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x))*(c + d*x),x]
```

```
[Out] (F^a*(-(b^2*ExpIntegralEi[(b*Log[F])/(c + d*x)]*Log[F]^2) + F^(b/(c + d*x))
*(c + d*x)*(c + d*x + b*Log[F])))/(2*d)
```

fricas [A] time = 0.47, size = 77, normalized size = 0.91

$$-\frac{F^ab^2\mathrm{Ei}\left(\frac{b\log(F)}{dx+c}\right)\log(F)^2-\left(d^2x^2+2\,cdx+c^2+(bdx+bc)\log(F)\right)F^{\frac{adx+ac+b}{dx+c}}}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))*(d*x+c),x, algorithm="fricas")
```

```
[Out] -1/2*(F^a*b^2*Ei(b*log(F)/(d*x + c))*log(F)^2 - (d^2*x^2 + 2*c*d*x + c^2 +
(b*d*x + b*c)*log(F))*F^((a*d*x + a*c + b)/(d*x + c)))/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int(dx+c)F^{a+\frac{b}{dx+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))*(d*x+c),x, algorithm="giac")
```

```
[Out] integrate((d*x + c)*F^(a + b/(d*x + c)), x)
```

maple [A] time = 0.13, size = 133, normalized size = 1.56

$$\frac{b^2F^a \operatorname{Ei}\left(1,-\frac{b\ln(F)}{dx+c}\right)\ln(F)^2}{2d}+\frac{bx\,F^aF^{\frac{b}{dx+c}}\ln(F)}{2}+\frac{d\,x^2F^aF^{\frac{b}{dx+c}}}{2}+\frac{bc\,F^aF^{\frac{b}{dx+c}}\ln(F)}{2d}+cx\,F^aF^{\frac{b}{dx+c}}+\frac{c^2F^aF^{\frac{b}{dx+c}}}{2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)*b)*(d*x+c),x)
```

```
[Out] 1/2*d*F^a*F^(1/(d*x+c)*b)*x^2+F^a*F^(1/(d*x+c)*b)*c*x+1/2/d*F^a*F^(1/(d*x+c
)*b)*c^2+1/2*b*ln(F)*F^a*F^(1/(d*x+c)*b)*x+1/2/d*b*ln(F)*F^a*F^(1/(d*x+c)*b
)*c+1/2/d*b^2*ln(F)^2*F^a*Ei(1,-1/(d*x+c)*b*ln(F))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2}\left(F^a dx^2+\left(F^a b\log(F)+2\,F^a c\right)x\right)F^{\frac{b}{dx+c}}+\int\frac{\left(F^a b^2 dx\log(F)^2-F^a bc^2\log(F)\right)F^{\frac{b}{dx+c}}}{2\left(d^2x^2+2\,cdx+c^2\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))*(d*x+c),x, algorithm="maxima")
```

```
[Out] 1/2*(F^a*d*x^2 + (F^a*b*log(F) + 2*F^a*c)*x)*F^(b/(d*x + c)) + integrate(1/
2*(F^a*b^2*d*x*log(F)^2 - F^a*b*c^2*log(F))*F^(b/(d*x + c))/(d^2*x^2 + 2*c*
d*x + c^2), x)
```

mupad [B] time = 6.11, size = 82, normalized size = 0.96

$$\frac{F^a\,F^{\frac{b}{c+d\,x}}\,{\left(c+d\,x\right)}^2}{2\,d}+\frac{F^a\,b^2\,{\ln(F)}^2\,\mathrm{expint}\left(-\frac{b\,\ln(F)}{c+d\,x}\right)}{2\,d}+\frac{F^a\,F^{\frac{b}{c+d\,x}}\,b\,\ln(F)\,\left(c+d\,x\right)}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x))*(c + d*x),x)
```

```
[Out] (F^a*F^(b/(c + d*x))*(c + d*x)^2)/(2*d) + (F^a*b^2*log(F)^2*expint(-(b*log(
F))/(c + d*x)))/(2*d) + (F^a*F^(b/(c + d*x))*b*log(F)*(c + d*x))/(2*d)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{c+dx}}\left(c+dx\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c))*(d*x+c),x)
```

```
[Out] Integral(F**(a + b/(c + d*x))*(c + d*x), x)
```

3.306 $\int F^{a+\frac{b}{c+dx}}\,dx$

Optimal. Leaf size=46

$$\frac{(c+dx)F^{a+\frac{b}{c+dx}}}{d}-\frac{bF^a\log(F)\text{Ei}\left(\frac{b\log(F)}{c+dx}\right)}{d}$$

[Out] F^(a+b/(d*x+c))*(d*x+c)/d-b*F^a*Ei(b*ln(F)/(d*x+c))*ln(F)/d

Rubi [A] time = 0.05, antiderivative size = 46, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2206, 2210}

$$\frac{(c+dx)F^{a+\frac{b}{c+dx}}}{d}-\frac{bF^a\log(F)\text{Ei}\left(\frac{b\log(F)}{c+dx}\right)}{d}$$

Antiderivative was successfully verified.

[In] Int[F^(a + b/(c + d*x)),x]

[Out] (F^(a + b/(c + d*x))*(c + d*x))/d - (b*F^a*ExpIntegralEi[(b*Log[F])/(c + d*x)]*Log[F])/d

Rule 2206

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[((c +
 d*x)*F^(a + b*(c + d*x)^n))/d, x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\begin{aligned}\int F^{a+\frac{b}{c+dx}}\,dx&=\frac{F^{a+\frac{b}{c+dx}}(c+dx)}{d}+(b\log(F))\int\frac{F^{a+\frac{b}{c+dx}}}{c+dx}\,dx\\&=\frac{F^{a+\frac{b}{c+dx}}(c+dx)}{d}-\frac{bF^a\text{Ei}\left(\frac{b\log(F)}{c+dx}\right)\log(F)}{d}\end{aligned}$$

Mathematica [A] time = 0.03, size = 42, normalized size = 0.91

$$\frac{F^a\left((c+dx)F^{\frac{b}{c+dx}}-b\log(F)\text{Ei}\left(\frac{b\log(F)}{c+dx}\right)\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)),x]
```

```
[Out] (F^a*(F^(b/(c + d*x))*(c + d*x) - b*ExpIntegralEi[(b*Log[F])/(c + d*x)]*Log
[F]))/d
```

fricas [A] time = 0.42, size = 51, normalized size = 1.11

$$-\frac{F^a b\text{Ei}\left(\frac{b\log(F)}{dx+c}\right)\log(F)-(dx+c)F^{\frac{adx+ac+b}{dx+c}}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)),x, algorithm="fricas")
```

```
[Out] -(F^a*b*Ei(b*log(F)/(d*x + c))*log(F) - (d*x + c)*F^((a*d*x + a*c + b)/(d*x
 + c)))/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{dx+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)),x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c)), x)
```

maple [A] time = 0.12, size = 61, normalized size = 1.33

$$\frac{b\,F^a\,\text{Ei}\left(1,-\frac{b\ln(F)}{dx+c}\right)\ln(F)}{d}+x\,F^a F^{\frac{b}{dx+c}}+\frac{c\,F^a F^{\frac{b}{dx+c}}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)*b),x)
```

```
[Out] F^a*F^(1/(d*x+c)*b)*x+1/d*F^a*F^(1/(d*x+c)*b)*c+b/d*ln(F)*F^a*Ei(1,-1/(d*x+
c)*b*ln(F))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$F^{a}bd\int \frac{F^{\frac{b}{dx+c}}x}{d^{2}x^{2}+2\,cdx+c^{2}}\,dx\log(F)+F^{a}F^{\frac{b}{dx+c}}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)),x, algorithm="maxima")
```

```
[Out] F^a*b*d*integrate(F^(b/(d*x + c))*x/(d^2*x^2 + 2*c*d*x + c^2), x)*log(F) +
F^a*F^(b/(d*x + c))*x
```

mupad [B] time = 4.40, size = 47, normalized size = 1.02

$$\frac{F^{a}\,F^{\frac{b}{c+d\,x}}\,\left(c+d\,x\right)}{d}+\frac{F^{a}\,b\,\ln(F)\,\mathrm{expint}\left(-\frac{b\,\ln(F)}{c+d\,x}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)),x)
```

```
[Out] (F^a*F^(b/(c + d*x))*(c + d*x))/d + (F^a*b*log(F)*expint(-(b*log(F))/(c + d
*x)))/d
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{c+dx}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)),x)
```

```
[Out] Integral(F**(a + b/(c + d*x)), x)
```

3.307 $\int \frac{F^{a+\frac{b}{c+dx}}}{c+dx} dx$

Optimal. Leaf size=20

$$-\frac{F^a \text{Ei}\left(\frac{b \log(F)}{c+dx}\right)}{d}$$

```
[Out] -F^a*Ei(b*ln(F)/(d*x+c))/d
```

Rubi [A] time = 0.04, antiderivative size = 20, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2210}

$$-\frac{F^a \text{Ei}\left(\frac{b \log(F)}{c+dx}\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x))/(c + d*x),x]
```

```
[Out] -((F^a*ExpIntegralEi[(b*Log[F])/(c + d*x)])/d)
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{c+dx}}}{c+dx} dx = -\frac{F^a \text{Ei}\left(\frac{b \log(F)}{c+dx}\right)}{d}$$

Mathematica [A] time = 0.00, size = 20, normalized size = 1.00

$$-\frac{F^a \text{Ei}\left(\frac{b \log(F)}{c+dx}\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x))/(c + d*x),x]
```

[Out] -((F^a*ExpIntegralEi[(b*Log[F])/(c + d*x)])/d)

fricas [A] time = 0.42, size = 20, normalized size = 1.00

$$-\frac{F^a \text{Ei}\left(\frac{b\log(F)}{dx+c}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b/(d*x+c))/(d*x+c),x, algorithm="fricas")

[Out] -F^a*Ei(b*log(F)/(d*x + c))/d

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{dx+c}}}{dx+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b/(d*x+c))/(d*x+c),x, algorithm="giac")

[Out] integrate(F^(a + b/(d*x + c))/(d*x + c), x)

maple [A] time = 0.12, size = 22, normalized size = 1.10

$$\frac{F^a \text{Ei}\left(1,-\frac{b\ln(F)}{dx+c}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(F^(a+1/(d*x+c)*b)/(d*x+c),x)

[Out] 1/d*F^a*Ei(1,-1/(d*x+c)*b*ln(F))

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{dx+c}}}{dx+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b/(d*x+c))/(d*x+c),x, algorithm="maxima")

[Out] integrate(F^(a + b/(d*x + c))/(d*x + c), x)

mupad [B] time = 3.76, size = 20, normalized size = 1.00

$$-\frac{F^a\,\mathrm{ei}\left(\frac{b\,\ln(F)}{c+d\,x}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x))/(c + d*x),x)
```

```
[Out] -(F^a*ei((b*log(F))/(c + d*x)))/d
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{F^{a+\frac{b}{c+dx}}}{c+dx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c))/(d*x+c),x)
```

```
[Out] Integral(F**(a + b/(c + d*x))/(c + d*x), x)
```

3.308 $\int \frac{F^{a+\frac{b}{c+dx}}}{(c+dx)^2} dx$

Optimal. Leaf size=25

$$-\frac{F^{a+\frac{b}{c+dx}}}{bd\log(F)}$$

```
[Out] -F^(a+b/(d*x+c))/b/d/ln(F)
```

Rubi [A] time = 0.04, antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2209}

$$-\frac{F^{a+\frac{b}{c+dx}}}{bd\log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x))/(c + d*x)^2,x]
```

```
[Out] -(F^(a + b/(c + d*x))/(b*d*Log[F]))
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{c+dx}}}{(c+dx)^2} dx = -\frac{F^{a+\frac{b}{c+dx}}}{bd\log(F)}$$

Mathematica [A] time = 0.01, size = 25, normalized size = 1.00

$$-\frac{F^{a+\frac{b}{c+dx}}}{bd\log(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x))/(c + d*x)^2,x]
[Out] -(F^(a + b/(c + d*x))/(b*d*Log[F]))
```

fricas [A] time = 0.41, size = 31, normalized size = 1.24

$$-\frac{F^{\frac{adx+ac+b}{dx+c}}}{bd\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(d*x+c)^2,x, algorithm="fricas")
[Out] -F^((a*d*x + a*c + b)/(d*x + c))/(b*d*log(F))
```

giac [A] time = 0.25, size = 31, normalized size = 1.24

$$-\frac{F^{\frac{adx+ac+b}{dx+c}}}{bd\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(d*x+c)^2,x, algorithm="giac")
[Out] -F^((a*d*x + a*c + b)/(d*x + c))/(b*d*log(F))
```

maple [A] time = 0.00, size = 26, normalized size = 1.04

$$-\frac{F^{a+\frac{b}{dx+c}}}{bd\ln(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)*b)/(d*x+c)^2,x)
[Out] -F^(a+1/(d*x+c)*b)/b/d/ln(F)
```

maxima [A] time = 0.90, size = 25, normalized size = 1.00

$$-\frac{F^{a+\frac{b}{dx+c}}}{bd\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(d*x+c)^2,x, algorithm="maxima")
[Out] -F^(a + b/(d*x + c))/(b*d*log(F))
```

mupad [B] time = 5.04, size = 25, normalized size = 1.00

$$-\frac{F^{a+\frac{b}{c+d\,x}}}{b\,d\,\ln(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x))/(c + d*x)^2,x)
```

```
[Out] -F^(a + b/(c + d*x))/(b*d*log(F))
```

sympy [A] time = 0.24, size = 34, normalized size = 1.36

$$\begin{cases} -\frac{F^{a+\frac{b}{c+dx}}}{bd\log(F)} & \text{for } bd\log(F) \neq 0 \\ -\frac{1}{cd+d^2x} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c))/(d*x+c)**2,x)
```

```
[Out] Piecewise((-F**(a + b/(c + d*x))/(b*d*log(F)), Ne(b*d*log(F), 0)), (-1/(c*d
 + d**2*x), True))
```

3.309 $\int \frac{F^{a+\frac{b}{c+dx}}}{(c+dx)^3}\,dx$

Optimal. Leaf size=57

$$\frac{F^{a+\frac{b}{c+dx}}}{b^2 d\log^2(F)}-\frac{F^{a+\frac{b}{c+dx}}}{bd\log(F)(c+dx)}$$

```
[Out] F^(a+b/(d*x+c))/b^2/d/ln(F)^2-F^(a+b/(d*x+c))/b/d/(d*x+c)/ln(F)
```

Rubi [A] time = 0.08, antiderivative size = 57, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2212, 2209}

$$\frac{F^{a+\frac{b}{c+dx}}}{b^2 d\log^2(F)}-\frac{F^{a+\frac{b}{c+dx}}}{bd\log(F)(c+dx)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x))/(c + d*x)^3,x]
```

```
[Out] F^(a + b/(c + d*x))/(b^2*d*Log[F]^2) - F^(a + b/(c + d*x))/(b*d*(c + d*x)*L
og[F])
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{c+dx}}}{(c+dx)^3}\,dx = -\frac{F^{a+\frac{b}{c+dx}}}{bd(c+dx)\log(F)} - \frac{\int \frac{F^{a+\frac{b}{c+dx}}}{(c+dx)^2}\,dx}{b\log(F)}$$
$$= \frac{F^{a+\frac{b}{c+dx}}}{b^2d\log^2(F)} - \frac{F^{a+\frac{b}{c+dx}}}{bd(c+dx)\log(F)}$$

Mathematica [A] time = 0.02, size = 41, normalized size = 0.72

$$\frac{F^{a+\frac{b}{c+dx}}(-b\log(F)+c+dx)}{b^2d\log^2(F)(c+dx)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x))/(c + d*x)^3,x]
```

```
[Out] (F^(a + b/(c + d*x))*(c + d*x - b*Log[F]))/(b^2*d*(c + d*x)*Log[F]^2)
```

fricas [A] time = 0.42, size = 51, normalized size = 0.89

$$\frac{\left(dx-b\log(F)+c\right)F^{\frac{adx+ac+b}{dx+c}}}{\left(b^2d^2x+b^2cd\right)\log(F)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(d*x+c)^3,x, algorithm="fricas")
```

```
[Out] (d*x - b*log(F) + c)*F^((a*d*x + a*c + b)/(d*x + c))/((b^2*d^2*x + b^2*c*d)
*log(F)^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{dx+c}}}{(dx+c)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(d*x+c)^3,x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c))/(d*x + c)^3, x)
```

maple [A] time = 0.03, size = 106, normalized size = 1.86

$$\frac{\frac{d\,x^{2} \mathrm{e}^{\left(a+\frac{b}{dx+c}\right)\ln(F)}}{b^{2} \ln(F)^{2}}-\frac{(b\ln(F)-2c)x\,\mathrm{e}^{\left(a+\frac{b}{dx+c}\right)\ln(F)}}{b^{2} \ln(F)^{2}}-\frac{(b\ln(F)-c)c\,\mathrm{e}^{\left(a+\frac{b}{dx+c}\right)\ln(F)}}{b^{2} d\ln(F)^{2}}}{(dx+c)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)*b)/(d*x+c)^3,x)
```

```
[Out] (1/ln(F)^2/b^2*d*x^2*exp((a+1/(d*x+c)*b)*ln(F))-(b*ln(F)-2*c)/ln(F)^2/b^2*x
*exp((a+1/(d*x+c)*b)*ln(F))-c*(b*ln(F)-c)/d/ln(F)^2/b^2*exp((a+1/(d*x+c)*b)
*ln(F)))/(d*x+c)^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{dx+c}}}{(dx+c)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(d*x+c)^3,x, algorithm="maxima")
```

```
[Out] integrate(F^(a + b/(d*x + c))/(d*x + c)^3, x)
```

mupad [B] time = 6.23, size = 41, normalized size = 0.72

$$\frac{F^{a+\frac{b}{c+d\,x}}\,\left(c+d\,x-b\,\ln(F)\right)}{b^{2}\,d\ln(F)^{2}\,\left(c+d\,x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x))/(c + d*x)^3,x)
```

```
[Out] (F^(a + b/(c + d*x))*(c + d*x - b*log(F)))/(b^2*d*log(F)^2*(c + d*x))
```

sympy [A] time = 0.22, size = 44, normalized size = 0.77

$$\frac{F^{a+\frac{b}{c+dx}}\left(-b\log{(F)}+c+dx\right)}{b^{2}cd\log{(F)}^{2}+b^{2}d^{2}x\log{(F)}^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c))/(d*x+c)**3,x)
```

```
[Out] F**(a + b/(c + d*x))*(-b*log(F) + c + d*x)/(b**2*c*d*log(F)**2 + b**2*d**2*
x*log(F)**2)
```

3.310 $\int \frac{F^{a+\frac{b}{c+dx}}}{(c+dx)^4} dx$

Optimal. Leaf size=90

$$-\frac{2F^{a+\frac{b}{c+dx}}}{b^3d\log^3(F)}+\frac{2F^{a+\frac{b}{c+dx}}}{b^2d\log^2(F)(c+dx)}-\frac{F^{a+\frac{b}{c+dx}}}{bd\log(F)(c+dx)^2}$$

```
[Out] -2*F^(a+b/(d*x+c))/b^3/d/ln(F)^3+2*F^(a+b/(d*x+c))/b^2/d/(d*x+c)/ln(F)^2-F^
(a+b/(d*x+c))/b/d/(d*x+c)^2/ln(F)
```

Rubi [A] time = 0.13, antiderivative size = 90, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2212, 2209}

$$\frac{2F^{a+\frac{b}{c+dx}}}{b^2d\log^2(F)(c+dx)}-\frac{2F^{a+\frac{b}{c+dx}}}{b^3d\log^3(F)}-\frac{F^{a+\frac{b}{c+dx}}}{bd\log(F)(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x))/(c + d*x)^4,x]
```

```
[Out] (-2*F^(a + b/(c + d*x)))/(b^3*d*Log[F]^3) + (2*F^(a + b/(c + d*x)))/(b^2*d*
(c + d*x)*Log[F]^2) - F^(a + b/(c + d*x))/(b*d*(c + d*x)^2*Log[F])
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{c+dx}}}{(c+dx)^4}\,dx = -\frac{F^{a+\frac{b}{c+dx}}}{bd(c+dx)^2\log(F)} - \frac{2\int \frac{F^{a+\frac{b}{c+dx}}}{(c+dx)^3}\,dx}{b\log(F)}$$
$$= \frac{2F^{a+\frac{b}{c+dx}}}{b^2d(c+dx)\log^2(F)} - \frac{F^{a+\frac{b}{c+dx}}}{bd(c+dx)^2\log(F)} + \frac{2\int \frac{F^{a+\frac{b}{c+dx}}}{(c+dx)^2}\,dx}{b^2\log^2(F)}$$
$$= -\frac{2F^{a+\frac{b}{c+dx}}}{b^3d\log^3(F)} + \frac{2F^{a+\frac{b}{c+dx}}}{b^2d(c+dx)\log^2(F)} - \frac{F^{a+\frac{b}{c+dx}}}{bd(c+dx)^2\log(F)}$$

Mathematica [A] time = 0.03, size = 60, normalized size = 0.67

$$-\frac{F^{a+\frac{b}{c+dx}}\left(b^2\log^2(F) - 2b\log(F)(c+dx) + 2(c+dx)^2\right)}{b^3d\log^3(F)(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x))/(c + d*x)^4,x]
```

```
[Out] -((F^(a + b/(c + d*x))*(2*(c + d*x)^2 - 2*b*(c + d*x)*Log[F] + b^2*Log[F]^2
))/(b^3*d*(c + d*x)^2*Log[F]^3))
```

fricas [A] time = 0.40, size = 95, normalized size = 1.06

$$-\frac{\left(2\,d^2x^2 + b^2\log(F)^2 + 4\,cdx + 2\,c^2 - 2\,(bdx + bc)\log(F)\right)F^{\frac{adx+ac+b}{dx+c}}}{\left(b^3d^3x^2 + 2\,b^3cd^2x + b^3c^2d\right)\log(F)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(d*x+c)^4,x, algorithm="fricas")
```

```
[Out] -(2*d^2*x^2 + b^2*log(F)^2 + 4*c*d*x + 2*c^2 - 2*(b*d*x + b*c)*log(F))*F^((
a*d*x + a*c + b)/(d*x + c))/((b^3*d^3*x^2 + 2*b^3*c*d^2*x + b^3*c^2*d)*log(
F)^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{dx+c}}}{(dx+c)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b/(d*x+c))/(d*x+c)^4,x, algorithm="giac")

[Out] integrate(F^(a + b/(d*x + c))/(d*x + c)^4, x)

maple [A] time = 0.04, size = 169, normalized size = 1.88

$$\frac{-\frac{2d^2x^3\mathrm{e}^{\left(a+\frac{b}{dx+c}\right)\ln(F)}}{b^3\ln(F)^3}+\frac{2(b\ln(F)-3c)d\,x^2\mathrm{e}^{\left(a+\frac{b}{dx+c}\right)\ln(F)}}{b^3\ln(F)^3}-\frac{\left(b^2\ln(F)^2-4bc\ln(F)+6c^2\right)x\,\mathrm{e}^{\left(a+\frac{b}{dx+c}\right)\ln(F)}}{b^3\ln(F)^3}-\frac{\left(b^2\ln(F)^2-2bc\ln(F)+2c^2\right)c\,\mathrm{e}^{\left(a+\frac{b}{dx+c}\right)\ln(F)}}{b^3d\ln(F)^3}}{(dx+c)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(F^(a+1/(d*x+c)*b)/(d*x+c)^4,x)

[Out] (-2*d^2/ln(F)^3/b^3*x^3*exp((a+1/(d*x+c)*b)*ln(F))-(ln(F)^2*b^2-4*b*c*ln(F)+6*c^2)/ln(F)^3/b^3*x*exp((a+1/(d*x+c)*b)*ln(F))+2*d*(b*ln(F)-3*c)/ln(F)^3/b^3*x^2*exp((a+1/(d*x+c)*b)*ln(F))-(ln(F)^2*b^2-2*b*c*ln(F)+2*c^2)*c/b^3/ln(F)^3/d*exp((a+1/(d*x+c)*b)*ln(F)))/(d*x+c)^3

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{dx+c}}}{(dx+c)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b/(d*x+c))/(d*x+c)^4,x, algorithm="maxima")

[Out] integrate(F^(a + b/(d*x + c))/(d*x + c)^4, x)

mupad [B] time = 5.62, size = 104, normalized size = 1.16

$$-\frac{F^{a+\frac{b}{c+d\,x}}\,\left(\frac{b^2\,\ln(F)^2-2\,b\,c\,\ln(F)+2\,c^2}{b^3\,d^3\,\ln(F)^3}+\frac{2\,x^2}{b^3\,d\,\ln(F)^3}+\frac{2\,x\,(2\,c-b\,\ln(F))}{b^3\,d^2\,\ln(F)^3}\right)}{x^2+\frac{c^2}{d^2}+\frac{2\,c\,x}{d}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(F^(a + b/(c + d*x))/(c + d*x)^4,x)

[Out] -(F^(a + b/(c + d*x))*((b^2*log(F)^2 + 2*c^2 - 2*b*c*log(F))/(b^3*d^3*log(F)^3) + (2*x^2)/(b^3*d*log(F)^3) + (2*x*(2*c - b*log(F)))/(b^3*d^2*log(F)^3)))/(x^2 + c^2/d^2 + (2*c*x)/d)

sympy [A] time = 0.26, size = 102, normalized size = 1.13

$$\frac{F^{a+\frac{b}{c+dx}}\left(-b^2\log(F)^2+2bc\log(F)+2bdx\log(F)-2c^2-4cdx-2d^2x^2\right)}{b^3c^2d\log(F)^3+2b^3cd^2x\log(F)^3+b^3d^3x^2\log(F)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c))/(d*x+c)**4,x)
```

```
[Out] F**(a + b/(c + d*x))*(-b**2*log(F)**2 + 2*b*c*log(F) + 2*b*d*x*log(F) - 2*c
**2 - 4*c*d*x - 2*d**2*x**2)/(b**3*c**2*d*log(F)**3 + 2*b**3*c*d**2*x*log(F
)**3 + b**3*d**3*x**2*log(F)**3)
```

3.311 $\int \frac{F^{a+\frac{b}{c+dx}}}{(c+dx)^5} dx$

Optimal. Leaf size=122

$$\frac{6F^{a+\frac{b}{c+dx}}}{b^4d\log^4(F)}-\frac{6F^{a+\frac{b}{c+dx}}}{b^3d\log^3(F)(c+dx)}+\frac{3F^{a+\frac{b}{c+dx}}}{b^2d\log^2(F)(c+dx)^2}-\frac{F^{a+\frac{b}{c+dx}}}{bd\log(F)(c+dx)^3}$$

```
[Out] 6*F^(a+b/(d*x+c))/b^4/d/ln(F)^4-6*F^(a+b/(d*x+c))/b^3/d/(d*x+c)/ln(F)^3+3*F
^(a+b/(d*x+c))/b^2/d/(d*x+c)^2/ln(F)^2-F^(a+b/(d*x+c))/b/d/(d*x+c)^3/ln(F)
```

Rubi [A] time = 0.19, antiderivative size = 122, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2212, 2209}

$$\frac{3F^{a+\frac{b}{c+dx}}}{b^2d\log^2(F)(c+dx)^2}-\frac{6F^{a+\frac{b}{c+dx}}}{b^3d\log^3(F)(c+dx)}+\frac{6F^{a+\frac{b}{c+dx}}}{b^4d\log^4(F)}-\frac{F^{a+\frac{b}{c+dx}}}{bd\log(F)(c+dx)^3}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x))/(c + d*x)^5,x]
```

```
[Out] (6*F^(a + b/(c + d*x)))/(b^4*d*Log[F]^4) - (6*F^(a + b/(c + d*x)))/(b^3*d*(
c + d*x)*Log[F]^3) + (3*F^(a + b/(c + d*x)))/(b^2*d*(c + d*x)^2*Log[F]^2) -
 F^(a + b/(c + d*x))/(b*d*(c + d*x)^3*Log[F])
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{c+dx}}}{(c+dx)^5}\,dx = -\frac{F^{a+\frac{b}{c+dx}}}{bd(c+dx)^3\log(F)} - \frac{3\int \frac{F^{a+\frac{b}{c+dx}}}{(c+dx)^4}\,dx}{b\log(F)}$$

$$= \frac{3F^{a+\frac{b}{c+dx}}}{b^2d(c+dx)^2\log^2(F)} - \frac{F^{a+\frac{b}{c+dx}}}{bd(c+dx)^3\log(F)} + \frac{6\int \frac{F^{a+\frac{b}{c+dx}}}{(c+dx)^3}\,dx}{b^2\log^2(F)}$$

$$= -\frac{6F^{a+\frac{b}{c+dx}}}{b^3d(c+dx)\log^3(F)} + \frac{3F^{a+\frac{b}{c+dx}}}{b^2d(c+dx)^2\log^2(F)} - \frac{F^{a+\frac{b}{c+dx}}}{bd(c+dx)^3\log(F)} - \frac{6\int \frac{F^{a+\frac{b}{c+dx}}}{(c+dx)^2}\,dx}{b^3\log^3(F)}$$

$$= \frac{6F^{a+\frac{b}{c+dx}}}{b^4d\log^4(F)} - \frac{6F^{a+\frac{b}{c+dx}}}{b^3d(c+dx)\log^3(F)} + \frac{3F^{a+\frac{b}{c+dx}}}{b^2d(c+dx)^2\log^2(F)} - \frac{F^{a+\frac{b}{c+dx}}}{bd(c+dx)^3\log(F)}$$

Mathematica [A] time = 0.04, size = 76, normalized size = 0.62

$$\frac{F^{a+\frac{b}{c+dx}}\left(-b^3\log^3(F)+3b^2\log^2(F)(c+dx)-6b\log(F)(c+dx)^2+6(c+dx)^3\right)}{b^4d\log^4(F)(c+dx)^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x))/(c + d*x)^5,x]
```

```
[Out] (F^(a + b/(c + d*x))*(6*(c + d*x)^3 - 6*b*(c + d*x)^2*Log[F] + 3*b^2*(c + d
*x)*Log[F]^2 - b^3*Log[F]^3))/(b^4*d*(c + d*x)^3*Log[F]^4)
```

fricas [A] time = 0.40, size = 150, normalized size = 1.23

$$\frac{\left(6\,d^3x^3 - b^3\log(F)^3 + 18\,cd^2x^2 + 18\,c^2dx + 6\,c^3 + 3\left(b^2dx + b^2c\right)\log(F)^2 - 6\left(bd^2x^2 + 2\,bcdx + bc^2\right)\log(F)\right)F^{\frac{adx+ac+b}{dx+c}}}{\left(b^4d^4x^3 + 3\,b^4cd^3x^2 + 3\,b^4c^2d^2x + b^4c^3d\right)\log(F)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(d*x+c)^5,x, algorithm="fricas")
```

```
[Out] (6*d^3*x^3 - b^3*log(F)^3 + 18*c*d^2*x^2 + 18*c^2*d*x + 6*c^3 + 3*(b^2*d*x
+ b^2*c)*log(F)^2 - 6*(b*d^2*x^2 + 2*b*c*d*x + b*c^2)*log(F))*F^((a*d*x + a
*c + b)/(d*x + c))/((b^4*d^4*x^3 + 3*b^4*c*d^3*x^2 + 3*b^4*c^2*d^2*x + b^4*
c^3*d)*log(F)^4)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{dx+c}}}{(dx+c)^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(d*x+c)^5,x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c))/(d*x + c)^5, x)
```

maple [A] time = 0.05, size = 243, normalized size = 1.99

$$\frac{\frac{6d^3x^4\mathrm{e}^{\left(a+\frac{b}{dx+c}\right)\ln(F)}}{b^4\ln(F)^4}-\frac{6(b\ln(F)-4c)d^2x^3\mathrm{e}^{\left(a+\frac{b}{dx+c}\right)\ln(F)}}{b^4\ln(F)^4}+\frac{3\left(b^2\ln(F)^2-6bc\ln(F)+12c^2\right)d\,x^2\mathrm{e}^{\left(a+\frac{b}{dx+c}\right)\ln(F)}}{b^4\ln(F)^4}-\frac{\left(b^3\ln(F)^3-6b^2c\ln(F)^2+18b\,c^2\ln(F)\right.}{b^4\ln(F)^4}}{(dx+c)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)*b)/(d*x+c)^5,x)
```

```
[Out] (-(ln(F)^3*b^3-6*ln(F)^2*b^2*c+18*b*c^2*ln(F)-24*c^3)/ln(F)^4/b^4*x*exp((a+
1/(d*x+c)*b)*ln(F))+6/ln(F)^4/b^4*d^3*x^4*exp((a+1/(d*x+c)*b)*ln(F))+3*d*(b
^2*ln(F)^2-6*b*c*ln(F)+12*c^2)/ln(F)^4/b^4*x^2*exp((a+1/(d*x+c)*b)*ln(F))-6
*d^2*(b*ln(F)-4*c)/ln(F)^4/b^4*x^3*exp((a+1/(d*x+c)*b)*ln(F))-(ln(F)^3*b^3-
3*ln(F)^2*b^2*c+6*b*c^2*ln(F)-6*c^3)*c/b^4/ln(F)^4/d*exp((a+1/(d*x+c)*b)*ln
(F)))/(d*x+c)^4
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{dx+c}}}{(dx+c)^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(d*x+c)^5,x, algorithm="maxima")
```

```
[Out] integrate(F^(a + b/(d*x + c))/(d*x + c)^5, x)
```

mupad [B] time = 3.80, size = 161, normalized size = 1.32

$$\frac{F^{a+\frac{b}{c+d\,x}}\left(\frac{6\,x^3}{b^4\,d\ln(F)^4}-\frac{b^3\ln(F)^3-3\,b^2\,c\ln(F)^2+6\,b\,c^2\,\ln(F)-6\,c^3}{b^4\,d^4\ln(F)^4}+\frac{x^2\,(18\,c-6\,b\,\ln(F))}{b^4\,d^2\ln(F)^4}+\frac{3\,x\left(b^2\ln(F)^2-4\,b\,c\,\ln(F)+6\,c^2\right)}{b^4\,d^3\ln(F)^4}\right)}{x^3+\frac{c^3}{d^3}+\frac{3\,c\,x^2}{d}+\frac{3\,c^2\,x}{d^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x))/(c + d*x)^5,x)
```

```
[Out] (F^(a + b/(c + d*x))*((6*x^3)/(b^4*d*log(F)^4) - (b^3*log(F)^3 - 6*c^3 + 6*
b*c^2*log(F) - 3*b^2*c*log(F)^2)/(b^4*d^4*log(F)^4) + (x^2*(18*c - 6*b*log(
F)))/(b^4*d^2*log(F)^4) + (3*x*(b^2*log(F)^2 + 6*c^2 - 4*b*c*log(F)))/(b^4*
d^3*log(F)^4)))/(x^3 + c^3/d^3 + (3*c*x^2)/d + (3*c^2*x)/d^2)
```

sympy [A] time = 0.31, size = 177, normalized size = 1.45

$$\frac{F^{a+\frac{b}{c+dx}}\left(-b^3\log(F)^3+3b^2c\log(F)^2+3b^2dx\log(F)^2-6bc^2\log(F)-12bcdx\log(F)-6bd^2x^2\log(F)+6c^3+18\right.}{b^4c^3d\log(F)^4+3b^4c^2d^2x\log(F)^4+3b^4cd^3x^2\log(F)^4+b^4d^4x^3\log(F)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c))/(d*x+c)**5,x)
```

```
[Out] F**(a + b/(c + d*x))*(-b**3*log(F)**3 + 3*b**2*c*log(F)**2 + 3*b**2*d*x*log
(F)**2 - 6*b*c**2*log(F) - 12*b*c*d*x*log(F) - 6*b*d**2*x**2*log(F) + 6*c**
3 + 18*c**2*d*x + 18*c*d**2*x**2 + 6*d**3*x**3)/(b**4*c**3*d*log(F)**4 + 3*
b**4*c**2*d**2*x*log(F)**4 + 3*b**4*c*d**3*x**2*log(F)**4 + b**4*d**4*x**3*
log(F)**4)
```

3.312 $\int \frac{F^{a+\frac{b}{c+dx}}}{(c+dx)^6}\,dx$

Optimal. Leaf size=92

$$-\frac{F^{a+\frac{b}{c+dx}}\left(b^4\log^4(F)-4b^3\log^3(F)(c+dx)+12b^2\log^2(F)(c+dx)^2-24b\log(F)(c+dx)^3+24(c+dx)^4\right)}{b^5d\log^5(F)(c+dx)^4}$$

```
[Out] -F^(a+b/(d*x+c))*(24*(d*x+c)^4-24*b*(d*x+c)^3*ln(F)+12*b^2*(d*x+c)^2*ln(F)^
2-4*b^3*(d*x+c)*ln(F)^3+b^4*ln(F)^4)/b^5/d/(d*x+c)^4/ln(F)^5
```

Rubi [C] time = 0.05, antiderivative size = 29, normalized size of antiderivative = 0.32, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2218}

$$-\frac{F^a\text{Gamma}\left(5,-\frac{b\log(F)}{c+dx}\right)}{b^5d\log^5(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x))/(c + d*x)^6,x]
```

```
[Out] -((F^a*Gamma[5, -((b*Log[F])/(c + d*x))])/(b^5*d*Log[F]^5))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{c+dx}}}{(c+dx)^6}\,dx=-\frac{F^a\Gamma\left(5,-\frac{b\log(F)}{c+dx}\right)}{b^5d\log^5(F)}$$

Mathematica [C] time = 0.01, size = 29, normalized size = 0.32

$$-\frac{F^a\Gamma\left(5,-\frac{b\log(F)}{c+dx}\right)}{b^5d\log^5(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x))/(c + d*x)^6,x]
```

```
[Out] -((F^a*Gamma[5, -((b*Log[F])/(c + d*x))])/(b^5*d*Log[F]^5))
```

fricas [B] time = 0.41, size = 219, normalized size = 2.38

$$-\frac{\left(24\,d^4x^4 + b^4\log(F)^4 + 96\,cd^3x^3 + 144\,c^2d^2x^2 + 96\,c^3dx + 24\,c^4 - 4\left(b^3dx + b^3c\right)\log(F)^3 + 12\left(b^2d^2x^2 + 2\,b^2cd\right.\right.}{\left(b^5d^5x^4 + 4\,b^5cd^4x^3 + 6\,b^5c^2d^3x^2 + 4\,b^5c^3d^2x + b^5\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(d*x+c)^6,x, algorithm="fricas")
```

```
[Out] -(24*d^4*x^4 + b^4*log(F)^4 + 96*c*d^3*x^3 + 144*c^2*d^2*x^2 + 96*c^3*d*x +
 24*c^4 - 4*(b^3*d*x + b^3*c)*log(F)^3 + 12*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^
2*c^2)*log(F)^2 - 24*(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3)*log(
F))*F^((a*d*x + a*c + b)/(d*x + c))/((b^5*d^5*x^4 + 4*b^5*c*d^4*x^3 + 6*b^5
*c^2*d^3*x^2 + 4*b^5*c^3*d^2*x + b^5*c^4*d)*log(F)^5)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{dx+c}}}{(dx+c)^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(d*x+c)^6,x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c))/(d*x + c)^6, x)
```

maple [B] time = 0.06, size = 329, normalized size = 3.58

$$\frac{-\frac{24d^4x^5\mathrm{e}^{\left(a+\frac{b}{dx+c}\right)\ln(F)}}{b^5\ln(F)^5} + \frac{24(b\ln(F)-5c)d^3x^4\mathrm{e}^{\left(a+\frac{b}{dx+c}\right)\ln(F)}}{b^5\ln(F)^5} - \frac{12\left(b^2\ln(F)^2-8bc\ln(F)+20c^2\right)d^2x^3\mathrm{e}^{\left(a+\frac{b}{dx+c}\right)\ln(F)}}{b^5\ln(F)^5} + \frac{4\left(b^3\ln(F)^3-9b^2c\ln(F)^2+36bc^2\right.}{b^5\ln}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)*b)/(d*x+c)^6,x)
```

```
[Out] (-24*d^4/ln(F)^5/b^5*x^5*exp((a+1/(d*x+c)*b)*ln(F))-(b^4*ln(F)^4-8*ln(F)^3*
b^3*c+36*ln(F)^2*b^2*c^2-96*b*c^3*ln(F)+120*c^4)/ln(F)^5/b^5*x*exp((a+1/(d*
x+c)*b)*ln(F))+4*d*(b^3*ln(F)^3-9*b^2*c*ln(F)^2+36*b*c^2*ln(F)-60*c^3)/ln(F
```

```
)^5/b^5*x^2*exp((a+1/(d*x+c)*b)*ln(F))-12*d^2*(b^2*ln(F)^2-8*b*c*ln(F)+20*c
^2)/ln(F)^5/b^5*x^3*exp((a+1/(d*x+c)*b)*ln(F))+24*d^3*(b*ln(F)-5*c)/ln(F)^5
/b^5*x^4*exp((a+1/(d*x+c)*b)*ln(F))-(b^4*ln(F)^4-4*ln(F)^3*b^3*c+12*ln(F)^2
*b^2*c^2-24*b*c^3*ln(F)+24*c^4)*c/b^5/ln(F)^5/d*exp((a+1/(d*x+c)*b)*ln(F)))
/(d*x+c)^5
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{dx+c}}}{(dx+c)^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(d*x+c)^6,x, algorithm="maxima")
```

```
[Out] integrate(F^(a + b/(d*x + c))/(d*x + c)^6, x)
```

mupad [B] time = 3.88, size = 231, normalized size = 2.51

$$-\frac{F^{a+\frac{b}{c+d\,x}}\,\left(\frac{b^4\ln(F)^4-4\,b^3\,c\ln(F)^3+12\,b^2\,c^2\ln(F)^2-24\,b\,c^3\,\ln(F)+24\,c^4}{b^5\,d^5\ln(F)^5}+\frac{24\,x^4}{b^5\,d\ln(F)^5}+\frac{x^2\left(12\,b^2\ln(F)^2-72\,b\,c\,\ln(F)+144\,c^2\right)}{b^5\,d^3\ln(F)^5}+\frac{x^3\,(96\,c-24\,b\,\ln}{b^5\,d^2\ln(F)}\right.}{x^4+\frac{c^4}{d^4}+\frac{4\,c\,x^3}{d}+\frac{4\,c^3\,x}{d^3}+\frac{6\,c^2\,x^2}{d^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x))/(c + d*x)^6,x)
```

```
[Out] -(F^(a + b/(c + d*x))*((b^4*log(F)^4 + 24*c^4 - 24*b*c^3*log(F) - 4*b^3*c*l
og(F)^3 + 12*b^2*c^2*log(F)^2)/(b^5*d^5*log(F)^5) + (24*x^4)/(b^5*d*log(F)^
5) + (x^2*(12*b^2*log(F)^2 + 144*c^2 - 72*b*c*log(F)))/(b^5*d^3*log(F)^5) +
 (x^3*(96*c - 24*b*log(F)))/(b^5*d^2*log(F)^5) - (4*x*(b^3*log(F)^3 - 24*c^
3 + 18*b*c^2*log(F) - 6*b^2*c*log(F)^2))/(b^5*d^4*log(F)^5)))/(x^4 + c^4/d^
4 + (4*c*x^3)/d + (4*c^3*x)/d^3 + (6*c^2*x^2)/d^2)
```

sympy [B] time = 0.35, size = 272, normalized size = 2.96

$$\frac{F^{a+\frac{b}{c+dx}}\left(-b^4\log(F)^4+4b^3c\log(F)^3+4b^3dx\log(F)^3-12b^2c^2\log(F)^2-24b^2cdx\log(F)^2-12b^2d^2x^2\log(F)^2\right.}{b^5c^4d\log(F)^5+4b^5c^3d^2x\log(F)^5+6b^5c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c))/(d*x+c)**6,x)
```

```
[Out] F**(a + b/(c + d*x))*(-b**4*log(F)**4 + 4*b**3*c*log(F)**3 + 4*b**3*d*x*log
(F)**3 - 12*b**2*c**2*log(F)**2 - 24*b**2*c*d*x*log(F)**2 - 12*b**2*d**2*x*
```

```
*2*log(F)**2 + 24*b*c**3*log(F) + 72*b*c**2*d*x*log(F) + 72*b*c*d**2*x**2*l
og(F) + 24*b*d**3*x**3*log(F) - 24*c**4 - 96*c**3*d*x - 144*c**2*d**2*x**2
- 96*c*d**3*x**3 - 24*d**4*x**4)/(b**5*c**4*d*log(F)**5 + 4*b**5*c**3*d**2*
x*log(F)**5 + 6*b**5*c**2*d**3*x**2*log(F)**5 + 4*b**5*c*d**4*x**3*log(F)**
5 + b**5*d**5*x**4*log(F)**5)
```

3.313 $\int \frac{F^{a+\frac{b}{c+dx}}}{(c+dx)^7}\,dx$

Optimal. Leaf size=108

$$\frac{F^{a+\frac{b}{c+dx}}\left(-b^5\log^5(F)+5b^4\log^4(F)(c+dx)-20b^3\log^3(F)(c+dx)^2+60b^2\log^2(F)(c+dx)^3-120b\log(F)(c+d\right.}{b^6d\log^6(F)(c+dx)^5}$$

```
[Out] F^(a+b/(d*x+c))*(120*(d*x+c)^5-120*b*(d*x+c)^4*ln(F)+60*b^2*(d*x+c)^3*ln(F)
^2-20*b^3*(d*x+c)^2*ln(F)^3+5*b^4*(d*x+c)*ln(F)^4-b^5*ln(F)^5)/b^6/d/(d*x+c
)^5/ln(F)^6
```

Rubi [C] time = 0.05, antiderivative size = 28, normalized size of antiderivative = 0.26, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2218}

$$\frac{F^a\text{Gamma}\left(6,-\frac{b\log(F)}{c+dx}\right)}{b^6d\log^6(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x))/(c + d*x)^7,x]
```

```
[Out] (F^a*Gamma[6, -((b*Log[F])/(c + d*x))])/(b^6*d*Log[F]^6)
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{c+dx}}}{(c+dx)^7}\,dx=\frac{F^a\Gamma\left(6,-\frac{b\log(F)}{c+dx}\right)}{b^6d\log^6(F)}$$

Mathematica [C] time = 0.01, size = 28, normalized size = 0.26

$$\frac{F^a\Gamma\left(6,-\frac{b\log(F)}{c+dx}\right)}{b^6d\log^6(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x))/(c + d*x)^7,x]
```

```
[Out] (F^a*Gamma[6, -((b*Log[F])/(c + d*x))])/(b^6*d*Log[F]^6)
```

fricas [B] time = 0.43, size = 302, normalized size = 2.80

$$\frac{\left(120\,d^5x^5 - b^5\log(F)^5 + 600\,cd^4x^4 + 1200\,c^2d^3x^3 + 1200\,c^3d^2x^2 + 600\,c^4dx + 120\,c^5 + 5\left(b^4dx + b^4c\right)\log(F)^4 - 2\right.}{\left(b^6d^6x^5 + 5\,b^6cd\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(d*x+c)^7,x, algorithm="fricas")
```

```
[Out] (120*d^5*x^5 - b^5*log(F)^5 + 600*c*d^4*x^4 + 1200*c^2*d^3*x^3 + 1200*c^3*d
^2*x^2 + 600*c^4*d*x + 120*c^5 + 5*(b^4*d*x + b^4*c)*log(F)^4 - 20*(b^3*d^2
*x^2 + 2*b^3*c*d*x + b^3*c^2)*log(F)^3 + 60*(b^2*d^3*x^3 + 3*b^2*c*d^2*x^2
+ 3*b^2*c^2*d*x + b^2*c^3)*log(F)^2 - 120*(b*d^4*x^4 + 4*b*c*d^3*x^3 + 6*b*
c^2*d^2*x^2 + 4*b*c^3*d*x + b*c^4)*log(F))*F^((a*d*x + a*c + b)/(d*x + c))/
((b^6*d^6*x^5 + 5*b^6*c*d^5*x^4 + 10*b^6*c^2*d^4*x^3 + 10*b^6*c^3*d^3*x^2 +
 5*b^6*c^4*d^2*x + b^6*c^5*d)*log(F)^6)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{dx+c}}}{(dx+c)^7}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(d*x+c)^7,x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c))/(d*x + c)^7, x)
```

maple [B] time = 0.08, size = 427, normalized size = 3.95

$$\frac{\frac{120d^5x^6e^{\left(a+\frac{b}{dx+c}\right)\ln(F)}}{b^6\ln(F)^6} - \frac{120(b\ln(F)-6c)d^4x^5e^{\left(a+\frac{b}{dx+c}\right)\ln(F)}}{b^6\ln(F)^6} + \frac{60\left(b^2\ln(F)^2-10bc\ln(F)+30c^2\right)d^3x^4e^{\left(a+\frac{b}{dx+c}\right)\ln(F)}}{b^6\ln(F)^6} - \frac{20\left(b^3\ln(F)^3-12b^2c\ln(F)^2+60\right.}{b}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)*b)/(d*x+c)^7,x)
```

```
[Out] (120*d^5/ln(F)^6/b^6*x^6*exp((a+1/(d*x+c)*b)*ln(F))-(b^5*ln(F)^5-10*ln(F)^4
*b^4*c+60*ln(F)^3*b^3*c^2-240*ln(F)^2*b^2*c^3+600*ln(F)*b*c^4-720*c^5)/ln(F
```

```
)^6/b^6*x*exp((a+1/(d*x+c)*b)*ln(F))+5*d*(b^4*ln(F)^4-12*b^3*c*ln(F)^3+72*b
^2*c^2*ln(F)^2-240*b*c^3*ln(F)+360*c^4)/b^6/ln(F)^6*x^2*exp((a+1/(d*x+c)*b)
*ln(F))-20*d^2*(b^3*ln(F)^3-12*b^2*c*ln(F)^2+60*b*c^2*ln(F)-120*c^3)/ln(F)^
6/b^6*x^3*exp((a+1/(d*x+c)*b)*ln(F))+60*d^3*(b^2*ln(F)^2-10*b*c*ln(F)+30*c^
2)/ln(F)^6/b^6*x^4*exp((a+1/(d*x+c)*b)*ln(F))-120*d^4*(b*ln(F)-6*c)/ln(F)^6
/b^6*x^5*exp((a+1/(d*x+c)*b)*ln(F))-(b^5*ln(F)^5-5*ln(F)^4*b^4*c+20*ln(F)^3
*b^3*c^2-60*ln(F)^2*b^2*c^3+120*ln(F)*b*c^4-120*c^5)*c/b^6/ln(F)^6/d*exp((a
+1/(d*x+c)*b)*ln(F)))/(d*x+c)^6
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{dx+c}}}{(dx+c)^7}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(d*x+c)^7,x, algorithm="maxima")
```

```
[Out] integrate(F^(a + b/(d*x + c))/(d*x + c)^7, x)
```

mupad [B] time = 3.94, size = 315, normalized size = 2.92

$$\frac{F^a\,F^{\frac{b}{c+d\,x}}\,\left(\frac{120\,x^5}{b^6\,d\,\ln(F)^6}-\frac{b^5\,\ln(F)^5-5\,b^4\,c\,\ln(F)^4+20\,b^3\,c^2\,\ln(F)^3-60\,b^2\,c^3\,\ln(F)^2+120\,b\,c^4\,\ln(F)-120\,c^5}{b^6\,d^6\,\ln(F)^6}-\frac{20\,x^2\,\left(b^3\,\ln(F)^3-9\,b^2\,c\,\ln(F)^2+36\,b\,c^2\,\ln\right.}{b^6\,d^4\,\ln(F)^6}\right.}{x^5+\frac{c^5}{d^5}+\frac{5\,c\,x^4}{d}+\frac{5\,c^4\,x}{d^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x))/(c + d*x)^7,x)
```

```
[Out] (F^a*F^(b/(c + d*x))*((120*x^5)/(b^6*d*log(F)^6) - (b^5*log(F)^5 - 120*c^5
+ 120*b*c^4*log(F) - 5*b^4*c*log(F)^4 - 60*b^2*c^3*log(F)^2 + 20*b^3*c^2*lo
g(F)^3)/(b^6*d^6*log(F)^6) - (20*x^2*(b^3*log(F)^3 - 60*c^3 + 36*b*c^2*log(
F) - 9*b^2*c*log(F)^2))/(b^6*d^4*log(F)^6) + (60*x^3*(b^2*log(F)^2 + 20*c^2
 - 8*b*c*log(F)))/(b^6*d^3*log(F)^6) + (120*x^4*(5*c - b*log(F)))/(b^6*d^2*
log(F)^6) + (5*x*(b^4*log(F)^4 + 120*c^4 - 96*b*c^3*log(F) - 8*b^3*c*log(F)
^3 + 36*b^2*c^2*log(F)^2))/(b^6*d^5*log(F)^6)))/(x^5 + c^5/d^5 + (5*c*x^4)/
d + (5*c^4*x)/d^4 + (10*c^2*x^3)/d^2 + (10*c^3*x^2)/d^3)
```

sympy [B] time = 0.40, size = 388, normalized size = 3.59

$$\frac{F^{a+\frac{b}{c+dx}}\left(-b^5\log(F)^5+5b^4c\log(F)^4+5b^4dx\log(F)^4-20b^3c^2\log(F)^3-40b^3cdx\log(F)^3-20b^3d^2x^2\log(F)^3\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c))/(d*x+c)**7,x)
```

```
[Out] F**(a + b/(c + d*x))*(-b**5*log(F)**5 + 5*b**4*c*log(F)**4 + 5*b**4*d*x*log
(F)**4 - 20*b**3*c**2*log(F)**3 - 40*b**3*c*d*x*log(F)**3 - 20*b**3*d**2*x*
*2*log(F)**3 + 60*b**2*c**3*log(F)**2 + 180*b**2*c**2*d*x*log(F)**2 + 180*b
**2*c*d**2*x**2*log(F)**2 + 60*b**2*d**3*x**3*log(F)**2 - 120*b*c**4*log(F)
 - 480*b*c**3*d*x*log(F) - 720*b*c**2*d**2*x**2*log(F) - 480*b*c*d**3*x**3*
log(F) - 120*b*d**4*x**4*log(F) + 120*c**5 + 600*c**4*d*x + 1200*c**3*d**2*
x**2 + 1200*c**2*d**3*x**3 + 600*c*d**4*x**4 + 120*d**5*x**5)/(b**6*c**5*d*
log(F)**6 + 5*b**6*c**4*d**2*x*log(F)**6 + 10*b**6*c**3*d**3*x**2*log(F)**6
 + 10*b**6*c**2*d**4*x**3*log(F)**6 + 5*b**6*c*d**5*x**4*log(F)**6 + b**6*d
**6*x**5*log(F)**6)
```

3.314 $\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)^m\,dx$

Optimal. Leaf size=61

$$\frac{F^a(c+dx)^{m+1}\left(-\frac{b\log(F)}{(c+dx)^2}\right)^{\frac{m+1}{2}}\Gamma\left(\frac{1}{2}(-m-1),-\frac{b\log(F)}{(c+dx)^2}\right)}{2d}$$

```
[Out] 1/2*F^a*(d*x+c)^(1+m)*GAMMA(-1/2-1/2*m,-b*ln(F)/(d*x+c)^2)*(-b*ln(F)/(d*x+c
)^2)^(1/2+1/2*m)/d
```

Rubi [A] time = 0.05, antiderivative size = 61, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2218}

$$\frac{F^a(c+dx)^{m+1}\left(-\frac{b\log(F)}{(c+dx)^2}\right)^{\frac{m+1}{2}}\text{Gamma}\left(\frac{1}{2}(-m-1),-\frac{b\log(F)}{(c+dx)^2}\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2)*(c + d*x)^m,x]
```

```
[Out] (F^a*(c + d*x)^(1 + m)*Gamma[(-1 - m)/2, -((b*Log[F])/(c + d*x)^2)]*(-((b*L
og[F])/(c + d*x)^2))^((1 + m)/2))/(2*d)
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)^m\,dx=\frac{F^a(c+dx)^{1+m}\Gamma\left(\frac{1}{2}(-1-m),-\frac{b\log(F)}{(c+dx)^2}\right)\left(-\frac{b\log(F)}{(c+dx)^2}\right)^{\frac{1+m}{2}}}{2d}$$

Mathematica [A] time = 0.04, size = 61, normalized size = 1.00

$$\frac{F^a(c+dx)^{m+1}\left(-\frac{b\log(F)}{(c+dx)^2}\right)^{\frac{m+1}{2}}\Gamma\left(\frac{1}{2}(-m-1),-\frac{b\log(F)}{(c+dx)^2}\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^2)*(c + d*x)^m,x]
```

```
[Out] (F^a*(c + d*x)^(1 + m)*Gamma[(-1 - m)/2, -((b*Log[F])/(c + d*x)^2)]*(-((b*L
og[F])/(c + d*x)^2))^((1 + m)/2))/(2*d)
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left((dx+c)^m F^{\frac{ad^2x^2+2\,acdx+ac^2+b}{d^2x^2+2\,cdx+c^2}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^m,x, algorithm="fricas")
```

```
[Out] integral((d*x + c)^m*F^((a*d^2*x^2 + 2*a*c*d*x + a*c^2 + b)/(d^2*x^2 + 2*c*
d*x + c^2)), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)^m F^{a+\frac{b}{(dx+c)^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^m,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^m*F^(a + b/(d*x + c)^2), x)
```

maple [F] time = 0.11, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{(dx+c)^2}} (dx+c)^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c)^2)*(d*x+c)^m,x)
```

```
[Out] int(F^(a+b/(d*x+c)^2)*(d*x+c)^m,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)^m F^{a+\frac{b}{(dx+c)^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^m,x, algorithm="maxima")
```

```
[Out] integrate((d*x + c)^m*F^(a + b/(d*x + c)^2), x)
```

mupad [B] time = 3.76, size = 73, normalized size = 1.20

$$\frac{F^a\,{\mathrm{e}}^{\frac{b\,\ln(F)}{2\,{(c+d\,x)}^2}}\,{(c+d\,x)}^{m+1}\,{\mathrm{M}}_{\frac{m}{4}+\frac{3}{4},-\frac{m}{4}-\frac{1}{4}}\left(\frac{b\,\ln(F)}{{(c+d\,x)}^2}\right)\,{\left(\frac{b\,\ln(F)}{{(c+d\,x)}^2}\right)}^{\frac{m}{4}-\frac{1}{4}}}{d\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)*(c + d*x)^m,x)
```

```
[Out] (F^a*exp((b*log(F))/(2*(c + d*x)^2))*(c + d*x)^(m + 1)*whittakerM(m/4 + 3/4
, - m/4 - 1/4, (b*log(F))/(c + d*x)^2)*((b*log(F))/(c + d*x)^2)^(m/4 - 1/4)
)/(d*(m + 1))
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)*(d*x+c)**m,x)
```

```
[Out] Timed out
```

3.315 $\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)^9\,dx$

Optimal. Leaf size=31

$$-\frac{b^5F^a\log^5(F)\Gamma\left(-5,-\frac{b\log(F)}{(c+dx)^2}\right)}{2d}$$

```
[Out] 1/2*F^a*(d*x+c)^10*Ei(6,-b*ln(F)/(d*x+c)^2)/d
```

Rubi [A] time = 0.05, antiderivative size = 31, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2218}

$$-\frac{b^5F^a\log^5(F)\text{Gamma}\left(-5,-\frac{b\log(F)}{(c+dx)^2}\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2)*(c + d*x)^9,x]
```

```
[Out] -(b^5*F^a*Gamma[-5, -((b*Log[F])/(c + d*x)^2)]*Log[F]^5)/(2*d)
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)^9\,dx=-\frac{b^5F^a\Gamma\left(-5,-\frac{b\log(F)}{(c+dx)^2}\right)\log^5(F)}{2d}$$

Mathematica [A] time = 0.01, size = 31, normalized size = 1.00

$$-\frac{b^5F^a\log^5(F)\Gamma\left(-5,-\frac{b\log(F)}{(c+dx)^2}\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^2)*(c + d*x)^9,x]
```

```
[Out] -1/2*(b^5*F^a*Gamma[-5, -((b*Log[F])/(c + d*x)^2)]*Log[F]^5)/d
```

fricas [B] time = 0.42, size = 465, normalized size = 15.00

$$-\frac{F^a b^5 \text{Ei}\left(\frac{b\log(F)}{d^2x^2+2\,cdx+c^2}\right)\log(F)^5 - \left(24\,d^{10}x^{10} + 240\,cd^9x^9 + 1080\,c^2d^8x^8 + 2880\,c^3d^7x^7 + 5040\,c^4d^6x^6 + 6048\,c^5d\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^9,x, algorithm="fricas")
```

```
[Out] -1/240*(F^a*b^5*Ei(b*log(F)/(d^2*x^2 + 2*c*d*x + c^2))*log(F)^5 - (24*d^10*
x^10 + 240*c*d^9*x^9 + 1080*c^2*d^8*x^8 + 2880*c^3*d^7*x^7 + 5040*c^4*d^6*x
^6 + 6048*c^5*d^5*x^5 + 5040*c^6*d^4*x^4 + 2880*c^7*d^3*x^3 + 1080*c^8*d^2*
x^2 + 240*c^9*d*x + 24*c^10 + (b^4*d^2*x^2 + 2*b^4*c*d*x + b^4*c^2)*log(F)^
4 + (b^3*d^4*x^4 + 4*b^3*c*d^3*x^3 + 6*b^3*c^2*d^2*x^2 + 4*b^3*c^3*d*x + b^
3*c^4)*log(F)^3 + 2*(b^2*d^6*x^6 + 6*b^2*c*d^5*x^5 + 15*b^2*c^2*d^4*x^4 + 2
0*b^2*c^3*d^3*x^3 + 15*b^2*c^4*d^2*x^2 + 6*b^2*c^5*d*x + b^2*c^6)*log(F)^2
+ 6*(b*d^8*x^8 + 8*b*c*d^7*x^7 + 28*b*c^2*d^6*x^6 + 56*b*c^3*d^5*x^5 + 70*b
*c^4*d^4*x^4 + 56*b*c^5*d^3*x^3 + 28*b*c^6*d^2*x^2 + 8*b*c^7*d*x + b*c^8)*l
og(F))*F^((a*d^2*x^2 + 2*a*c*d*x + a*c^2 + b)/(d^2*x^2 + 2*c*d*x + c^2)))/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)^9 F^{a+\frac{b}{(dx+c)^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^9,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^9*F^(a + b/(d*x + c)^2), x)
```

maple [B] time = 0.13, size = 961, normalized size = 31.00

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)^2*b)*(d*x+c)^9,x)
```

```
[Out] 1/120*F^a*d^5*b^2*ln(F)^2*F^(1/(d*x+c)^2*b)*x^6+1/240*F^a*d^3*b^3*ln(F)^3*F
^(1/(d*x+c)^2*b)*x^4+1/240*F^a*d*b^4*ln(F)^4*F^(1/(d*x+c)^2*b)*x^2+1/120*F^
a*b^4*ln(F)^4*F^(1/(d*x+c)^2*b)*c*x+1/20*F^a*b^2*ln(F)^2*F^(1/(d*x+c)^2*b)*
c^5*x+1/60*F^a*b^3*ln(F)^3*F^(1/(d*x+c)^2*b)*c^3*x+1/5*F^a*b*ln(F)*F^(1/(d*
```

```
x+c)^2*b)*c^7*x+1/40*F^a/d*b*ln(F)*F^(1/(d*x+c)^2*b)*c^8+1/120*F^a/d*b^2*ln
(F)^2*F^(1/(d*x+c)^2*b)*c^6+1/240*F^a/d*b^3*ln(F)^3*F^(1/(d*x+c)^2*b)*c^4+1
/240*F^a/d*b^4*ln(F)^4*F^(1/(d*x+c)^2*b)*c^2+1/40*F^a*d^7*b*ln(F)*F^(1/(d*x
+c)^2*b)*x^8+1/40*F^a*d*b^3*ln(F)^3*F^(1/(d*x+c)^2*b)*c^2*x^2+7/10*F^a*d*b*
ln(F)*F^(1/(d*x+c)^2*b)*c^6*x^2+1/5*F^a*d^6*b*ln(F)*F^(1/(d*x+c)^2*b)*c*x^7
+7/10*F^a*d^5*b*ln(F)*F^(1/(d*x+c)^2*b)*c^2*x^6+7/5*F^a*d^4*b*ln(F)*F^(1/(d
*x+c)^2*b)*c^3*x^5+7/4*F^a*d^3*b*ln(F)*F^(1/(d*x+c)^2*b)*c^4*x^4+7/5*F^a*d^
2*b*ln(F)*F^(1/(d*x+c)^2*b)*c^5*x^3+1/20*F^a*d^4*b^2*ln(F)^2*F^(1/(d*x+c)^2
*b)*c*x^5+1/8*F^a*d^3*b^2*ln(F)^2*F^(1/(d*x+c)^2*b)*c^2*x^4+1/6*F^a*d^2*b^2
*ln(F)^2*F^(1/(d*x+c)^2*b)*c^3*x^3+1/8*F^a*d*b^2*ln(F)^2*F^(1/(d*x+c)^2*b)*
c^4*x^2+1/60*F^a*d^2*b^3*ln(F)^3*F^(1/(d*x+c)^2*b)*c*x^3+1/10*F^a/d*F^(1/(d
*x+c)^2*b)*c^10+1/10*F^a*d^9*F^(1/(d*x+c)^2*b)*x^10+F^a*F^(1/(d*x+c)^2*b)*c
^9*x+F^a*d^8*F^(1/(d*x+c)^2*b)*c*x^9+9/2*F^a*d^7*F^(1/(d*x+c)^2*b)*c^2*x^8+
12*F^a*d^6*F^(1/(d*x+c)^2*b)*c^3*x^7+21*F^a*d^5*F^(1/(d*x+c)^2*b)*c^4*x^6+1
26/5*F^a*d^4*F^(1/(d*x+c)^2*b)*c^5*x^5+21*F^a*d^3*F^(1/(d*x+c)^2*b)*c^6*x^4
+12*F^a*d^2*F^(1/(d*x+c)^2*b)*c^7*x^3+9/2*F^a*d*F^(1/(d*x+c)^2*b)*c^8*x^2+1
/240*F^a/d*b^5*ln(F)^5*Ei(1,-b*ln(F)/(d*x+c)^2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{240}\left(24\,F^{a}d^{9}x^{10}+240\,F^{a}cd^{8}x^{9}+6\left(180\,F^{a}c^{2}d^{7}+F^{a}bd^{7}\log(F)\right)x^{8}+48\left(60\,F^{a}c^{3}d^{6}+F^{a}bcd^{6}\log(F)\right)x^{7}+2\left(2520\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^9,x, algorithm="maxima")
```

```
[Out] 1/240*(24*F^a*d^9*x^10 + 240*F^a*c*d^8*x^9 + 6*(180*F^a*c^2*d^7 + F^a*b*d^7
*log(F))*x^8 + 48*(60*F^a*c^3*d^6 + F^a*b*c*d^6*log(F))*x^7 + 2*(2520*F^a*c
^4*d^5 + 84*F^a*b*c^2*d^5*log(F) + F^a*b^2*d^5*log(F)^2)*x^6 + 12*(504*F^a*
c^5*d^4 + 28*F^a*b*c^3*d^4*log(F) + F^a*b^2*c*d^4*log(F)^2)*x^5 + (5040*F^a
*c^6*d^3 + 420*F^a*b*c^4*d^3*log(F) + 30*F^a*b^2*c^2*d^3*log(F)^2 + F^a*b^3
*d^3*log(F)^3)*x^4 + 4*(720*F^a*c^7*d^2 + 84*F^a*b*c^5*d^2*log(F) + 10*F^a*
b^2*c^3*d^2*log(F)^2 + F^a*b^3*c*d^2*log(F)^3)*x^3 + (1080*F^a*c^8*d + 168*
F^a*b*c^6*d*log(F) + 30*F^a*b^2*c^4*d*log(F)^2 + 6*F^a*b^3*c^2*d*log(F)^3 +
 F^a*b^4*d*log(F)^4)*x^2 + 2*(120*F^a*c^9 + 24*F^a*b*c^7*log(F) + 6*F^a*b^2
*c^5*log(F)^2 + 2*F^a*b^3*c^3*log(F)^3 + F^a*b^4*c*log(F)^4)*x)*F^(b/(d^2*x
^2 + 2*c*d*x + c^2)) + integrate(1/120*(F^a*b^5*d^2*x^2*log(F)^5 + 2*F^a*b^
5*c*d*x*log(F)^5 - 24*F^a*b*c^10*log(F) - 6*F^a*b^2*c^8*log(F)^2 - 2*F^a*b^
3*c^6*log(F)^3 - F^a*b^4*c^4*log(F)^4)*F^(b/(d^2*x^2 + 2*c*d*x + c^2))/(d^3
*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3), x)
```

mupad [B] time = 3.95, size = 136, normalized size = 4.39

$$\frac{F^a\,b^5\ln(F)^5\,\mathrm{expint}\left(-\frac{b\,\ln(F)}{(c+d\,x)^2}\right)}{240\,d}+\frac{F^a\,F^{\frac{b}{(c+d\,x)^2}}\,b^5\ln(F)^5\,\left(\frac{(c+d\,x)^2}{120\,b\,\ln(F)}+\frac{(c+d\,x)^4}{120\,b^2\ln(F)^2}+\frac{(c+d\,x)^6}{60\,b^3\ln(F)^3}+\frac{(c+d\,x)^8}{20\,b^4\ln(F)^4}+\frac{(c+d\,x)^{10}}{5\,b^5\ln(F)^5}\right)}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)*(c + d*x)^9,x)
```

```
[Out] (F^a*b^5*log(F)^5*expint(-(b*log(F))/(c + d*x)^2))/(240*d) + (F^a*F^(b/(c +
 d*x)^2)*b^5*log(F)^5*((c + d*x)^2/(120*b*log(F)) + (c + d*x)^4/(120*b^2*lo
g(F)^2) + (c + d*x)^6/(60*b^3*log(F)^3) + (c + d*x)^8/(20*b^4*log(F)^4) + (
c + d*x)^10/(5*b^5*log(F)^5)))/(2*d)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)*(d*x+c)**9,x)
```

```
[Out] Timed out
```

3.316 $\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)^7\,dx$

Optimal. Leaf size=31

$$\frac{b^4F^a\log^4(F)\Gamma\left(-4,-\frac{b\log(F)}{(c+dx)^2}\right)}{2d}$$

```
[Out] 1/2*F^a*(d*x+c)^8*Ei(5,-b*ln(F)/(d*x+c)^2)/d
```

Rubi [A] time = 0.05, antiderivative size = 31, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2218}

$$\frac{b^4F^a\log^4(F)\text{Gamma}\left(-4,-\frac{b\log(F)}{(c+dx)^2}\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2)*(c + d*x)^7,x]
```

```
[Out] (b^4*F^a*Gamma[-4, -((b*Log[F])/(c + d*x)^2)]*Log[F]^4)/(2*d)
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)^7\,dx=\frac{b^4F^a\Gamma\left(-4,-\frac{b\log(F)}{(c+dx)^2}\right)\log^4(F)}{2d}$$

Mathematica [A] time = 0.01, size = 31, normalized size = 1.00

$$\frac{b^4F^a\log^4(F)\Gamma\left(-4,-\frac{b\log(F)}{(c+dx)^2}\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^2)*(c + d*x)^7,x]
```

```
[Out] (b^4*F^a*Gamma[-4, -((b*Log[F])/(c + d*x)^2)]*Log[F]^4)/(2*d)
```

fricas [B] time = 0.44, size = 331, normalized size = 10.68

$$-\frac{F^{a}b^{4}\mathrm{Ei}\left(\frac{b\log(F)}{d^{2}x^{2}+2\,cdx+c^{2}}\right)\log(F)^{4}-\left(6\,d^{8}x^{8}+48\,cd^{7}x^{7}+168\,c^{2}d^{6}x^{6}+336\,c^{3}d^{5}x^{5}+420\,c^{4}d^{4}x^{4}+336\,c^{5}d^{3}x^{3}+168$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^7,x, algorithm="fricas")
```

```
[Out] -1/48*(F^a*b^4*Ei(b*log(F)/(d^2*x^2 + 2*c*d*x + c^2))*log(F)^4 - (6*d^8*x^8
 + 48*c*d^7*x^7 + 168*c^2*d^6*x^6 + 336*c^3*d^5*x^5 + 420*c^4*d^4*x^4 + 336
*c^5*d^3*x^3 + 168*c^6*d^2*x^2 + 48*c^7*d*x + 6*c^8 + (b^3*d^2*x^2 + 2*b^3*
c*d*x + b^3*c^2)*log(F)^3 + (b^2*d^4*x^4 + 4*b^2*c*d^3*x^3 + 6*b^2*c^2*d^2*
x^2 + 4*b^2*c^3*d*x + b^2*c^4)*log(F)^2 + 2*(b*d^6*x^6 + 6*b*c*d^5*x^5 + 15
*b*c^2*d^4*x^4 + 20*b*c^3*d^3*x^3 + 15*b*c^4*d^2*x^2 + 6*b*c^5*d*x + b*c^6)
*log(F))*F^((a*d^2*x^2 + 2*a*c*d*x + a*c^2 + b)/(d^2*x^2 + 2*c*d*x + c^2)))
/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int(dx+c)^{7}F^{a+\frac{b}{(dx+c)^{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^7,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^7*F^(a + b/(d*x + c)^2), x)
```

maple [B] time = 0.10, size = 646, normalized size = 20.84

$$\frac{d^{7}x^{8}F^{a}F^{\frac{b}{(dx+c)^{2}}}}{8}+c\,d^{6}x^{7}F^{a}F^{\frac{b}{(dx+c)^{2}}}+\frac{b\,d^{5}x^{6}F^{a}F^{\frac{b}{(dx+c)^{2}}}\ln(F)}{24}+\frac{7c^{2}d^{5}x^{6}F^{a}F^{\frac{b}{(dx+c)^{2}}}}{2}+\frac{bc\,d^{4}x^{5}F^{a}F^{\frac{b}{(dx+c)^{2}}}\ln(F)}{4}+7c^{3}d^{4}x^{5}F^{a}F$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)^2*b)*(d*x+c)^7,x)
```

```
[Out] 1/48*F^a/d*b^4*ln(F)^4*Ei(1,-1/(d*x+c)^2*b*ln(F))+F^a*d^6*F^(1/(d*x+c)^2*b)
*c*x^7+7/2*F^a*d^5*F^(1/(d*x+c)^2*b)*c^2*x^6+7*F^a*d^4*F^(1/(d*x+c)^2*b)*c^
3*x^5+35/4*F^a*d^3*F^(1/(d*x+c)^2*b)*c^4*x^4+7*F^a*d^2*F^(1/(d*x+c)^2*b)*c^
5*x^3+7/2*F^a*d*F^(1/(d*x+c)^2*b)*c^6*x^2+1/48*F^a/d*b^3*ln(F)^3*F^(1/(d*x+
```

```
c)^2*b)*c^2+1/12*F^a*b^2*ln(F)^2*F^(1/(d*x+c)^2*b)*c^3*x+1/24*F^a*b^3*ln(F)
^3*F^(1/(d*x+c)^2*b)*c*x+1/4*F^a*b*ln(F)*F^(1/(d*x+c)^2*b)*c^5*x+1/24*F^a*d
^5*b*ln(F)*F^(1/(d*x+c)^2*b)*x^6+1/48*F^a*d^3*b^2*ln(F)^2*F^(1/(d*x+c)^2*b)
*x^4+1/48*F^a*d*b^3*ln(F)^3*F^(1/(d*x+c)^2*b)*x^2+1/24*F^a/d*b*ln(F)*F^(1/(
d*x+c)^2*b)*c^6+1/48*F^a/d*b^2*ln(F)^2*F^(1/(d*x+c)^2*b)*c^4+F^a*F^(1/(d*x+
c)^2*b)*c^7*x+1/8*F^a/d*F^(1/(d*x+c)^2*b)*c^8+1/8*F^a*d^7*F^(1/(d*x+c)^2*b)
*x^8+1/4*F^a*d^4*b*ln(F)*F^(1/(d*x+c)^2*b)*c*x^5+5/8*F^a*d^3*b*ln(F)*F^(1/(
d*x+c)^2*b)*c^2*x^4+5/6*F^a*d^2*b*ln(F)*F^(1/(d*x+c)^2*b)*c^3*x^3+5/8*F^a*d
*b*ln(F)*F^(1/(d*x+c)^2*b)*c^4*x^2+1/12*F^a*d^2*b^2*ln(F)^2*F^(1/(d*x+c)^2*
b)*c*x^3+1/8*F^a*d*b^2*ln(F)^2*F^(1/(d*x+c)^2*b)*c^2*x^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{48}\left(6F^a d^7 x^8 + 48F^a c d^6 x^7 + 2\left(84F^a c^2 d^5 + F^a b d^5 \log(F)\right)x^6 + 12\left(28F^a c^3 d^4 + F^a b c d^4 \log(F)\right)x^5 + \left(420F^a c^4 d^3 +\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^7,x, algorithm="maxima")
```

```
[Out] 1/48*(6*F^a*d^7*x^8 + 48*F^a*c*d^6*x^7 + 2*(84*F^a*c^2*d^5 + F^a*b*d^5*log(
F))*x^6 + 12*(28*F^a*c^3*d^4 + F^a*b*c*d^4*log(F))*x^5 + (420*F^a*c^4*d^3 +
 30*F^a*b*c^2*d^3*log(F) + F^a*b^2*d^3*log(F)^2)*x^4 + 4*(84*F^a*c^5*d^2 +
10*F^a*b*c^3*d^2*log(F) + F^a*b^2*c*d^2*log(F)^2)*x^3 + (168*F^a*c^6*d + 30
*F^a*b*c^4*d*log(F) + 6*F^a*b^2*c^2*d*log(F)^2 + F^a*b^3*d*log(F)^3)*x^2 +
2*(24*F^a*c^7 + 6*F^a*b*c^5*log(F) + 2*F^a*b^2*c^3*log(F)^2 + F^a*b^3*c*log
(F)^3)*x)*F^(b/(d^2*x^2 + 2*c*d*x + c^2)) + integrate(1/24*(F^a*b^4*d^2*x^2
*log(F)^4 + 2*F^a*b^4*c*d*x*log(F)^4 - 6*F^a*b*c^8*log(F) - 2*F^a*b^2*c^6*l
og(F)^2 - F^a*b^3*c^4*log(F)^3)*F^(b/(d^2*x^2 + 2*c*d*x + c^2))/(d^3*x^3 +
3*c*d^2*x^2 + 3*c^2*d*x + c^3), x)
```

mupad [B] time = 3.84, size = 120, normalized size = 3.87

$$\frac{F^a\, b^4 \ln(F)^4\, \mathrm{expint}\left(-\frac{b\,\ln(F)}{(c+d\,x)^2}\right)}{48\,d}+\frac{F^a\, F^{\frac{b}{(c+d\,x)^2}}\, b^4 \ln(F)^4\,\left(\frac{(c+d\,x)^2}{24\,b\,\ln(F)}+\frac{(c+d\,x)^4}{24\,b^2\ln(F)^2}+\frac{(c+d\,x)^6}{12\,b^3\ln(F)^3}+\frac{(c+d\,x)^8}{4\,b^4\ln(F)^4}\right)}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)*(c + d*x)^7,x)
```

```
[Out] (F^a*b^4*log(F)^4*expint(-(b*log(F))/(c + d*x)^2))/(48*d) + (F^a*F^(b/(c +
d*x)^2)*b^4*log(F)^4*((c + d*x)^2/(24*b*log(F)) + (c + d*x)^4/(24*b^2*log(F
)^2) + (c + d*x)^6/(12*b^3*log(F)^3) + (c + d*x)^8/(4*b^4*log(F)^4)))/(2*d)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)*(d*x+c)**7,x)
```

```
[Out] Timed out
```

3.317 $\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)^5\,dx$

Optimal. Leaf size=121

$$-\frac{b^3F^a\log^3(F)\text{Ei}\left(\frac{b\log(F)}{(c+dx)^2}\right)}{12d}+\frac{b^2\log^2(F)(c+dx)^2F^{a+\frac{b}{(c+dx)^2}}}{12d}+\frac{(c+dx)^6F^{a+\frac{b}{(c+dx)^2}}}{6d}+\frac{b\log(F)(c+dx)^4F^{a+\frac{b}{(c+dx)^2}}}{12d}$$

```
[Out] 1/6*F^(a+b/(d*x+c)^2)*(d*x+c)^6/d+1/12*b*F^(a+b/(d*x+c)^2)*(d*x+c)^4*ln(F)/
d+1/12*b^2*F^(a+b/(d*x+c)^2)*(d*x+c)^2*ln(F)^2/d-1/12*b^3*F^a*Ei(b*ln(F)/(d
*x+c)^2)*ln(F)^3/d
```

Rubi [A] time = 0.19, antiderivative size = 121, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2214, 2210}

$$-\frac{b^3F^a\log^3(F)\text{Ei}\left(\frac{b\log(F)}{(c+dx)^2}\right)}{12d}+\frac{b^2\log^2(F)(c+dx)^2F^{a+\frac{b}{(c+dx)^2}}}{12d}+\frac{(c+dx)^6F^{a+\frac{b}{(c+dx)^2}}}{6d}+\frac{b\log(F)(c+dx)^4F^{a+\frac{b}{(c+dx)^2}}}{12d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2)*(c + d*x)^5,x]
```

```
[Out] (F^(a + b/(c + d*x)^2)*(c + d*x)^6)/(6*d) + (b*F^(a + b/(c + d*x)^2)*(c + d
*x)^4*Log[F])/(12*d) + (b^2*F^(a + b/(c + d*x)^2)*(c + d*x)^2*Log[F]^2)/(12
*d) - (b^3*F^a*ExpIntegralEi[(b*Log[F])/(c + d*x)^2]*Log[F]^3)/(12*d)
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)^5\,dx = \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^6}{6d} + \frac{1}{3}(b\log(F))\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)^3\,dx$$
$$= \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^6}{6d} + \frac{bF^{a+\frac{b}{(c+dx)^2}}(c+dx)^4\log(F)}{12d} + \frac{1}{6}\left(b^2\log^2(F)\right)\int F^{a+\frac{b}{(c+dx)^2}}(c+dx$$
$$= \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^6}{6d} + \frac{bF^{a+\frac{b}{(c+dx)^2}}(c+dx)^4\log(F)}{12d} + \frac{b^2F^{a+\frac{b}{(c+dx)^2}}(c+dx)^2\log^2(F)}{12d} + \frac{1}{6}($$
$$= \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^6}{6d} + \frac{bF^{a+\frac{b}{(c+dx)^2}}(c+dx)^4\log(F)}{12d} + \frac{b^2F^{a+\frac{b}{(c+dx)^2}}(c+dx)^2\log^2(F)}{12d} - \frac{b^3}{}$$

Mathematica [A] time = 0.17, size = 96, normalized size = 0.79

$$\frac{F^a\left(b\log(F)\left(b\log(F)\left((c+dx)^2F^{\frac{b}{(c+dx)^2}} - b\log(F)\text{Ei}\left(\frac{b\log(F)}{(c+dx)^2}\right)\right) + (c+dx)^4F^{\frac{b}{(c+dx)^2}}\right) + 2(c+dx)^6F^{\frac{b}{(c+dx)^2}}\right)}{12d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^2)*(c + d*x)^5,x]
```

```
[Out] (F^a*(2*F^(b/(c + d*x)^2)*(c + d*x)^6 + b*Log[F]*(F^(b/(c + d*x)^2)*(c + d*
x)^4 + b*Log[F]*(F^(b/(c + d*x)^2)*(c + d*x)^2 - b*ExpIntegralEi[(b*Log[F])
/(c + d*x)^2]*Log[F]))))/(12*d)
```

fricas [A] time = 0.45, size = 225, normalized size = 1.86

$$-\frac{F^a b^3\text{Ei}\left(\frac{b\log(F)}{d^2x^2+2\,cdx+c^2}\right)\log(F)^3 - \left(2\,d^6x^6 + 12\,cd^5x^5 + 30\,c^2d^4x^4 + 40\,c^3d^3x^3 + 30\,c^4d^2x^2 + 12\,c^5dx + 2\,c^6 + \left(b^2c\right.\right.}{12\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^5,x, algorithm="fricas")
```

```
[Out] -1/12*(F^a*b^3*Ei(b*log(F)/(d^2*x^2 + 2*c*d*x + c^2))*log(F)^3 - (2*d^6*x^6
 + 12*c*d^5*x^5 + 30*c^2*d^4*x^4 + 40*c^3*d^3*x^3 + 30*c^4*d^2*x^2 + 12*c^5
*d*x + 2*c^6 + (b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*log(F)^2 + (b*d^4*x^4
+ 4*b*c*d^3*x^3 + 6*b*c^2*d^2*x^2 + 4*b*c^3*d*x + b*c^4)*log(F))*F^((a*d^2*
x^2 + 2*a*c*d*x + a*c^2 + b)/(d^2*x^2 + 2*c*d*x + c^2)))/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)^5 F^{a+\frac{b}{(dx+c)^2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^5,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^5*F^(a + b/(d*x + c)^2), x)
```

maple [B] time = 0.08, size = 395, normalized size = 3.26

$$\frac{d^5x^6F^aF^{\frac{b}{(dx+c)^2}}}{6}+c\,d^4x^5F^aF^{\frac{b}{(dx+c)^2}}+\frac{b\,d^3x^4F^aF^{\frac{b}{(dx+c)^2}}\ln(F)}{12}+\frac{5c^2d^3x^4F^aF^{\frac{b}{(dx+c)^2}}}{2}+\frac{bc\,d^2x^3F^aF^{\frac{b}{(dx+c)^2}}\ln(F)}{3}+\frac{10c^3d^2x^3F^aF}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)^2*b)*(d*x+c)^5,x)
```

```
[Out] 1/6*F^a*d^5*F^(1/(d*x+c)^2*b)*x^6+F^a*d^4*F^(1/(d*x+c)^2*b)*c*x^5+5/2*F^a*d
^3*F^(1/(d*x+c)^2*b)*c^2*x^4+10/3*F^a*d^2*F^(1/(d*x+c)^2*b)*c^3*x^3+5/2*F^a
*d*F^(1/(d*x+c)^2*b)*c^4*x^2+F^a*F^(1/(d*x+c)^2*b)*c^5*x+1/6*F^a/d*F^(1/(d*
x+c)^2*b)*c^6+1/12*F^a*d^3*b*ln(F)*F^(1/(d*x+c)^2*b)*x^4+1/3*F^a*d^2*b*ln(F
)*F^(1/(d*x+c)^2*b)*c*x^3+1/2*F^a*d*b*ln(F)*F^(1/(d*x+c)^2*b)*c^2*x^2+1/3*F
^a*b*ln(F)*F^(1/(d*x+c)^2*b)*c^3*x+1/12*F^a/d*b*ln(F)*F^(1/(d*x+c)^2*b)*c^4
+1/12*F^a*d*b^2*ln(F)^2*F^(1/(d*x+c)^2*b)*x^2+1/6*F^a*b^2*ln(F)^2*F^(1/(d*x
+c)^2*b)*c*x+1/12*F^a/d*b^2*ln(F)^2*F^(1/(d*x+c)^2*b)*c^2+1/12*F^a/d*b^3*ln
(F)^3*Ei(1,-1/(d*x+c)^2*b*ln(F))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{12}\left(2\,F^ad^5x^6+12\,F^acd^4x^5+\left(30\,F^ac^2d^3+F^abd^3\log(F)\right)x^4+4\left(10\,F^ac^3d^2+F^abcd^2\log(F)\right)x^3+\left(30\,F^ac^4d+6\,F^ab\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^5,x, algorithm="maxima")
```

```
[Out] 1/12*(2*F^a*d^5*x^6 + 12*F^a*c*d^4*x^5 + (30*F^a*c^2*d^3 + F^a*b*d^3*log(F)
)*x^4 + 4*(10*F^a*c^3*d^2 + F^a*b*c*d^2*log(F))*x^3 + (30*F^a*c^4*d + 6*F^a
*b*c^2*d*log(F) + F^a*b^2*d*log(F)^2)*x^2 + 2*(6*F^a*c^5 + 2*F^a*b*c^3*log(
F) + F^a*b^2*c*log(F)^2)*x)*F^(b/(d^2*x^2 + 2*c*d*x + c^2)) + integrate(1/6
*(F^a*b^3*d^2*x^2*log(F)^3 + 2*F^a*b^3*c*d*x*log(F)^3 - 2*F^a*b*c^6*log(F)
```

```
- F^a*b^2*c^4*log(F)^2)*F^(b/(d^2*x^2 + 2*c*d*x + c^2))/(d^3*x^3 + 3*c*d^2*
x^2 + 3*c^2*d*x + c^3), x)
```

mupad [B] time = 3.78, size = 92, normalized size = 0.76

$$\frac{F^a\,b^3\,\ln(F)^3\,\left(\frac{\mathrm{expint}\left(-\frac{b\,\ln(F)}{(c+d\,x)^2}\right)}{6}+F^{\frac{b}{(c+d\,x)^2}}\,\left(\frac{(c+d\,x)^2}{6\,b\,\ln(F)}+\frac{(c+d\,x)^4}{6\,b^2\,\ln(F)^2}+\frac{(c+d\,x)^6}{3\,b^3\,\ln(F)^3}\right)\right)}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)*(c + d*x)^5,x)
```

```
[Out] (F^a*b^3*log(F)^3*(expint(-(b*log(F))/(c + d*x)^2)/6 + F^(b/(c + d*x)^2)*((
c + d*x)^2/(6*b*log(F)) + (c + d*x)^4/(6*b^2*log(F)^2) + (c + d*x)^6/(3*b^3
*log(F)^3))))/(2*d)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{(c+dx)^2}}\,(c+dx)^5\;dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)*(d*x+c)**5,x)
```

```
[Out] Integral(F**(a + b/(c + d*x)**2)*(c + d*x)**5, x)
```

3.318 $\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)^3\,dx$

Optimal. Leaf size=87

$$-\frac{b^2F^a\log^2(F)\text{Ei}\left(\frac{b\log(F)}{(c+dx)^2}\right)}{4d}+\frac{(c+dx)^4F^{a+\frac{b}{(c+dx)^2}}}{4d}+\frac{b\log(F)(c+dx)^2F^{a+\frac{b}{(c+dx)^2}}}{4d}$$

```
[Out] 1/4*F^(a+b/(d*x+c)^2)*(d*x+c)^4/d+1/4*b*F^(a+b/(d*x+c)^2)*(d*x+c)^2*ln(F)/d
-1/4*b^2*F^a*Ei(b*ln(F)/(d*x+c)^2)*ln(F)^2/d
```

Rubi [A] time = 0.12, antiderivative size = 87, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2214, 2210}

$$-\frac{b^2F^a\log^2(F)\text{Ei}\left(\frac{b\log(F)}{(c+dx)^2}\right)}{4d}+\frac{(c+dx)^4F^{a+\frac{b}{(c+dx)^2}}}{4d}+\frac{b\log(F)(c+dx)^2F^{a+\frac{b}{(c+dx)^2}}}{4d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2)*(c + d*x)^3,x]
```

```
[Out] (F^(a + b/(c + d*x)^2)*(c + d*x)^4)/(4*d) + (b*F^(a + b/(c + d*x)^2)*(c + d
*x)^2*Log[F])/(4*d) - (b^2*F^a*ExpIntegralEi[(b*Log[F])/(c + d*x)^2]*Log[F]
^2)/(4*d)
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)^3\,dx=\frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^4}{4d}+\frac{1}{2}(b\log(F))\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)\,dx$$
$$=\frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^4}{4d}+\frac{bF^{a+\frac{b}{(c+dx)^2}}(c+dx)^2\log(F)}{4d}+\frac{1}{2}\left(b^2\log^2(F)\right)\int\frac{F^{a+\frac{b}{(c+dx)^2}}}{c+dx}\,dx$$
$$=\frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^4}{4d}+\frac{bF^{a+\frac{b}{(c+dx)^2}}(c+dx)^2\log(F)}{4d}-\frac{b^2F^a\text{Ei}\left(\frac{b\log(F)}{(c+dx)^2}\right)\log^2(F)}{4d}$$

Mathematica [A] time = 0.04, size = 71, normalized size = 0.82

$$\frac{F^a\left(b\log(F)\left((c+dx)^2F^{\frac{b}{(c+dx)^2}}-b\log(F)\text{Ei}\left(\frac{b\log(F)}{(c+dx)^2}\right)\right)+(c+dx)^4F^{\frac{b}{(c+dx)^2}}\right)}{4d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^2)*(c + d*x)^3,x]
```

```
[Out] (F^a*(F^(b/(c + d*x)^2)*(c + d*x)^4 + b*Log[F]*(F^(b/(c + d*x)^2)*(c + d*x)
^2 - b*ExpIntegralEi[(b*Log[F])/(c + d*x)^2]*Log[F])))/(4*d)
```

fricas [A] time = 0.46, size = 145, normalized size = 1.67

$$-\frac{F^ab^2\text{Ei}\left(\frac{b\log(F)}{d^2x^2+2\,cdx+c^2}\right)\log(F)^2-\left(d^4x^4+4\,cd^3x^3+6\,c^2d^2x^2+4\,c^3dx+c^4+\left(bd^2x^2+2\,bcdx+bc^2\right)\log(F)\right)F^{\frac{ad^2\ldots}{d\ldots}}}{4\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^3,x, algorithm="fricas")
```

```
[Out] -1/4*(F^a*b^2*Ei(b*log(F)/(d^2*x^2 + 2*c*d*x + c^2))*log(F)^2 - (d^4*x^4 +
4*c*d^3*x^3 + 6*c^2*d^2*x^2 + 4*c^3*d*x + c^4 + (b*d^2*x^2 + 2*b*c*d*x + b*
c^2)*log(F))*F^((a*d^2*x^2 + 2*a*c*d*x + a*c^2 + b)/(d^2*x^2 + 2*c*d*x + c^
2)))/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int(dx+c)^3F^{a+\frac{b}{(dx+c)^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^3,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^3*F^(a + b/(d*x + c)^2), x)
```

maple [B] time = 0.07, size = 208, normalized size = 2.39

$$\frac{d^3x^4F^aF^{\frac{b}{(dx+c)^2}}}{4}+c\,d^2x^3F^aF^{\frac{b}{(dx+c)^2}}+\frac{bd\,x^2F^aF^{\frac{b}{(dx+c)^2}}\ln(F)}{4}+\frac{3c^2d\,x^2F^aF^{\frac{b}{(dx+c)^2}}}{2}+\frac{bcx\,F^aF^{\frac{b}{(dx+c)^2}}\ln(F)}{2}+c^3x\,F^aF^{\frac{b}{(dx+c)^2}}+\frac{b^2F}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)^2*b)*(d*x+c)^3,x)
```

```
[Out] 1/4*F^a*d^3*F^(1/(d*x+c)^2*b)*x^4+F^a*d^2*F^(1/(d*x+c)^2*b)*c*x^3+3/2*F^a*d
*F^(1/(d*x+c)^2*b)*c^2*x^2+F^a*F^(1/(d*x+c)^2*b)*c^3*x+1/4*F^a/d*F^(1/(d*x+
c)^2*b)*c^4+1/4*F^a*d*b*ln(F)*F^(1/(d*x+c)^2*b)*x^2+1/2*F^a*b*ln(F)*F^(1/(d
*x+c)^2*b)*c*x+1/4*F^a/d*b*ln(F)*F^(1/(d*x+c)^2*b)*c^2+1/4*F^a/d*b^2*ln(F)^
2*Ei(1,-1/(d*x+c)^2*b*ln(F))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{4}\left(F^ad^3x^4+4\,F^acd^2x^3+\left(6\,F^ac^2d+F^abd\log(F)\right)x^2+2\left(2\,F^ac^3+F^abc\log(F)\right)x\right)F^{\frac{b}{d^2x^2+2\,cdx+c^2}}+\int\frac{\left(F^ab^2d^2x^2\log(F\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^3,x, algorithm="maxima")
```

```
[Out] 1/4*(F^a*d^3*x^4 + 4*F^a*c*d^2*x^3 + (6*F^a*c^2*d + F^a*b*d*log(F))*x^2 + 2
*(2*F^a*c^3 + F^a*b*c*log(F))*x)*F^(b/(d^2*x^2 + 2*c*d*x + c^2)) + integrat
e(1/2*(F^a*b^2*d^2*x^2*log(F)^2 + 2*F^a*b^2*c*d*x*log(F)^2 - F^a*b*c^4*log(
F))*F^(b/(d^2*x^2 + 2*c*d*x + c^2))/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^
3), x)
```

mupad [B] time = 3.70, size = 76, normalized size = 0.87

$$\frac{F^a\,b^2\ln(F)^2\left(\frac{\mathrm{expint}\left(-\frac{b\,\ln(F)}{(c+d\,x)^2}\right)}{2}+F^{\frac{b}{(c+d\,x)^2}}\,\left(\frac{(c+d\,x)^2}{2\,b\,\ln(F)}+\frac{(c+d\,x)^4}{2\,b^2\ln(F)^2}\right)\right)}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)*(c + d*x)^3,x)
```

```
[Out] (F^a*b^2*log(F)^2*(expint(-(b*log(F))/(c + d*x)^2)/2 + F^(b/(c + d*x)^2)*((
c + d*x)^2/(2*b*log(F)) + (c + d*x)^4/(2*b^2*log(F)^2))))/(2*d)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)*(d*x+c)**3,x)
```

```
[Out] Integral(F**(a + b/(c + d*x)**2)*(c + d*x)**3, x)
```

3.319 $\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)\,dx$

Optimal. Leaf size=53

$$\frac{(c+dx)^2F^{a+\frac{b}{(c+dx)^2}}}{2d}-\frac{bF^a\log(F)\text{Ei}\left(\frac{b\log(F)}{(c+dx)^2}\right)}{2d}$$

```
[Out] 1/2*F^(a+b/(d*x+c)^2)*(d*x+c)^2/d-1/2*b*F^a*Ei(b*ln(F)/(d*x+c)^2)*ln(F)/d
```

Rubi [A] time = 0.07, antiderivative size = 53, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105, Rules used = {2214, 2210}

$$\frac{(c+dx)^2F^{a+\frac{b}{(c+dx)^2}}}{2d}-\frac{bF^a\log(F)\text{Ei}\left(\frac{b\log(F)}{(c+dx)^2}\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2)*(c + d*x),x]
```

```
[Out] (F^(a + b/(c + d*x)^2)*(c + d*x)^2)/(2*d) - (b*F^a*ExpIntegralEi[(b*Log[F])
/(c + d*x)^2]*Log[F])/(2*d)
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)\,dx = \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^2}{2d} + (b\log(F))\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{c+dx}\,dx$$
$$= \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^2}{2d} - \frac{bF^a\text{Ei}\left(\frac{b\log(F)}{(c+dx)^2}\right)\log(F)}{2d}$$

Mathematica [A] time = 0.02, size = 47, normalized size = 0.89

$$\frac{F^a\left((c+dx)^2F^{\frac{b}{(c+dx)^2}} - b\log(F)\text{Ei}\left(\frac{b\log(F)}{(c+dx)^2}\right)\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^2)*(c + d*x),x]
```

```
[Out] (F^a*(F^(b/(c + d*x)^2)*(c + d*x)^2 - b*ExpIntegralEi[(b*Log[F])/(c + d*x)^
2]*Log[F]))/(2*d)
```

fricas [A] time = 0.44, size = 96, normalized size = 1.81

$$-\frac{F^a b\text{Ei}\left(\frac{b\log(F)}{d^2x^2+2\,cdx+c^2}\right)\log(F) - \left(d^2x^2+2\,cdx+c^2\right)F^{\frac{ad^2x^2+2\,acdx+ac^2+b}{d^2x^2+2\,cdx+c^2}}}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c),x, algorithm="fricas")
```

```
[Out] -1/2*(F^a*b*Ei(b*log(F)/(d^2*x^2 + 2*c*d*x + c^2))*log(F) - (d^2*x^2 + 2*c*
d*x + c^2)*F^((a*d^2*x^2 + 2*a*c*d*x + a*c^2 + b)/(d^2*x^2 + 2*c*d*x + c^2)
))/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)F^{a+\frac{b}{(dx+c)^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c),x, algorithm="giac")
```

```
[Out] integrate((d*x + c)*F^(a + b/(d*x + c)^2), x)
```

maple [A] time = 0.06, size = 86, normalized size = 1.62

$$\frac{d\,x^2F^aF^{\frac{b}{(dx+c)^2}}}{2}+cx\,F^aF^{\frac{b}{(dx+c)^2}}+\frac{b\,F^a\,\mathrm{Ei}\left(1,-\frac{b\ln(F)}{(dx+c)^2}\right)\ln(F)}{2d}+\frac{c^2F^aF^{\frac{b}{(dx+c)^2}}}{2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)^2*b)*(d*x+c),x)
```

```
[Out] 1/2*d*F^a*F^(1/(d*x+c)^2*b)*x^2+F^a*F^(1/(d*x+c)^2*b)*c*x+1/2/d*F^a*F^(1/(d
*x+c)^2*b)*c^2+1/2/d*F^a*b*ln(F)*Ei(1,-1/(d*x+c)^2*b*ln(F))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2}\left(F^adx^2+2\,F^acx\right)F^{\frac{b}{d^2x^2+2\,cdx+c^2}}+\int\frac{\left(F^abd^2x^2\log(F)+2\,F^abcdx\log(F)\right)F^{\frac{b}{d^2x^2+2\,cdx+c^2}}}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c),x, algorithm="maxima")
```

```
[Out] 1/2*(F^a*d*x^2 + 2*F^a*c*x)*F^(b/(d^2*x^2 + 2*c*d*x + c^2)) + integrate((F^
a*b*d^2*x^2*log(F) + 2*F^a*b*c*d*x*log(F))*F^(b/(d^2*x^2 + 2*c*d*x + c^2))/
(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3), x)
```

mupad [B] time = 5.45, size = 51, normalized size = 0.96

$$\frac{F^a\,F^{\frac{b}{(c+d\,x)^2}}\,(c+d\,x)^2}{2\,d}+\frac{F^a\,b\,\ln(F)\,\mathrm{expint}\left(-\frac{b\,\ln(F)}{(c+d\,x)^2}\right)}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)*(c + d*x),x)
```

```
[Out] (F^a*F^(b/(c + d*x)^2)*(c + d*x)^2)/(2*d) + (F^a*b*log(F)*expint(-(b*log(F)
)/(c + d*x)^2))/(2*d)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{(c+dx)^2}}\,(c+dx)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)*(d*x+c),x)
```

```
[Out] Integral(F**(a + b/(c + d*x)**2)*(c + d*x), x)
```

3.320 $\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{c+dx}\,dx$

Optimal. Leaf size=22

$$-\frac{F^a\text{Ei}\left(\frac{b\log(F)}{(c+dx)^2}\right)}{2d}$$

```
[Out] -1/2*F^a*Ei(b*ln(F)/(d*x+c)^2)/d
```

Rubi [A] time = 0.04, antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2210}

$$-\frac{F^a\text{Ei}\left(\frac{b\log(F)}{(c+dx)^2}\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2)/(c + d*x),x]
```

```
[Out] -(F^a*ExpIntegralEi[(b*Log[F])/(c + d*x)^2])/(2*d)
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{c+dx}\,dx = -\frac{F^a\text{Ei}\left(\frac{b\log(F)}{(c+dx)^2}\right)}{2d}$$

Mathematica [A] time = 0.01, size = 22, normalized size = 1.00

$$-\frac{F^a\text{Ei}\left(\frac{b\log(F)}{(c+dx)^2}\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^2)/(c + d*x),x]
```

```
[Out] -1/2*(F^a*ExpIntegralEi[(b*Log[F])/(c + d*x)^2])/d
```

fricas [A] time = 0.42, size = 31, normalized size = 1.41

$$-\frac{F^a \operatorname{Ei}\left(\frac{b \log(F)}{d^2x^2+2\,cdx+c^2}\right)}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c),x, algorithm="fricas")
[Out] -1/2*F^a*Ei(b*log(F)/(d^2*x^2 + 2*c*d*x + c^2))/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{(dx+c)^2}}}{dx+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c),x, algorithm="giac")
[Out] integrate(F^(a + b/(d*x + c)^2)/(d*x + c), x)
```

maple [A] time = 0.06, size = 23, normalized size = 1.05

$$\frac{F^a \operatorname{Ei}\left(1,-\frac{b\ln(F)}{(dx+c)^2}\right)}{2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)^2*b)/(d*x+c),x)
[Out] 1/2/d*F^a*Ei(1,-1/(d*x+c)^2*b*ln(F))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{(dx+c)^2}}}{dx+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c),x, algorithm="maxima")
[Out] integrate(F^(a + b/(d*x + c)^2)/(d*x + c), x)
```

mupad [B] time = 3.70, size = 20, normalized size = 0.91

$$-\frac{F^a\,\mathrm{ei}\left(\frac{b\,\ln(F)}{(c+d\,x)^2}\right)}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)/(c + d*x),x)
[Out] -(F^a*ei((b*log(F))/(c + d*x)^2))/(2*d)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{c+dx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)/(d*x+c),x)
[Out] Integral(F**(a + b/(c + d*x)**2)/(c + d*x), x)
```

3.321 $\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^3}\,dx$

Optimal. Leaf size=27

$$-\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd\log(F)}$$

```
[Out] -1/2*F^(a+b/(d*x+c)^2)/b/d/ln(F)
```

Rubi [A] time = 0.04, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2209}

$$-\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd\log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2)/(c + d*x)^3,x]
```

```
[Out] -F^(a + b/(c + d*x)^2)/(2*b*d*Log[F])
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^3}\,dx = -\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd\log(F)}$$

Mathematica [A] time = 0.01, size = 27, normalized size = 1.00

$$-\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd\log(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^2)/(c + d*x)^3,x]
```

```
[Out] -1/2*F^(a + b/(c + d*x)^2)/(b*d*Log[F])
```

fricas [B] time = 0.40, size = 54, normalized size = 2.00

$$-\frac{F^{\left(\frac{ad^2x^2+2\,acdx+ac^2+b}{d^2x^2+2\,cdx+c^2}\right)}}{2\,bd\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^3,x, algorithm="fricas")
```

```
[Out] -1/2*F^((a*d^2*x^2 + 2*a*c*d*x + a*c^2 + b)/(d^2*x^2 + 2*c*d*x + c^2))/(b*d
*log(F))
```

giac [B] time = 0.26, size = 54, normalized size = 2.00

$$-\frac{F^{\left(\frac{ad^2x^2+2\,acdx+ac^2+b}{d^2x^2+2\,cdx+c^2}\right)}}{2\,bd\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^3,x, algorithm="giac")
```

```
[Out] -1/2*F^((a*d^2*x^2 + 2*a*c*d*x + a*c^2 + b)/(d^2*x^2 + 2*c*d*x + c^2))/(b*d
*log(F))
```

maple [A] time = 0.00, size = 26, normalized size = 0.96

$$-\frac{F^{a+\frac{b}{(dx+c)^2}}}{2bd\ln(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)^2*b)/(d*x+c)^3,x)
```

```
[Out] -1/2*F^(a+1/(d*x+c)^2*b)/b/d/ln(F)
```

maxima [A] time = 0.88, size = 25, normalized size = 0.93

$$-\frac{F^{a+\frac{b}{(dx+c)^2}}}{2\,bd\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^3,x, algorithm="maxima")
```

```
[Out] -1/2*F^(a + b/(d*x + c)^2)/(b*d*log(F))
```

mupad [B] time = 3.54, size = 37, normalized size = 1.37

$$-\frac{F^a\,F^{\frac{b}{c^2+2\,c\,d\,x+d^2\,x^2}}}{2\,b\,d\,\ln(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)/(c + d*x)^3,x)
```

```
[Out] -(F^a*F^(b/(c^2 + d^2*x^2 + 2*c*d*x)))/(2*b*d*log(F))
```

sympy [A] time = 0.34, size = 54, normalized size = 2.00

$$\begin{cases} -\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd\log{(F)}} & \text{for}\: 2bd\log{(F)} \neq 0 \\ -\frac{1}{2c^2d+4cd^2x+2d^3x^2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)/(d*x+c)**3,x)
```

```
[Out] Piecewise((-F**(a + b/(c + d*x)**2)/(2*b*d*log(F)), Ne(2*b*d*log(F), 0)), (
-1/(2*c**2*d + 4*c*d**2*x + 2*d**3*x**2), True))
```

3.322 $\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^5} dx$

Optimal. Leaf size=62

$$\frac{F^{a+\frac{b}{(c+dx)^2}}}{2b^2d\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd\log(F)(c+dx)^2}$$

```
[Out] 1/2*F^(a+b/(d*x+c)^2)/b^2/d/ln(F)^2-1/2*F^(a+b/(d*x+c)^2)/b/d/(d*x+c)^2/ln(
F)
```

Rubi [A] time = 0.09, antiderivative size = 62, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2212, 2209}

$$\frac{F^{a+\frac{b}{(c+dx)^2}}}{2b^2d\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd\log(F)(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2)/(c + d*x)^5,x]
```

```
[Out] F^(a + b/(c + d*x)^2)/(2*b^2*d*Log[F]^2) - F^(a + b/(c + d*x)^2)/(2*b*d*(c
+ d*x)^2*Log[F])
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^5}\,dx = -\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)^2\log(F)} - \frac{\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^3}\,dx}{b\log(F)}$$
$$= \frac{F^{a+\frac{b}{(c+dx)^2}}}{2b^2d\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)^2\log(F)}$$

Mathematica [A] time = 0.03, size = 47, normalized size = 0.76

$$\frac{F^{a+\frac{b}{(c+dx)^2}}\left((c+dx)^2-b\log(F)\right)}{2b^2d\log^2(F)(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^2)/(c + d*x)^5,x]
```

```
[Out] (F^(a + b/(c + d*x)^2)*((c + d*x)^2 - b*Log[F]))/(2*b^2*d*(c + d*x)^2*Log[F
]^2)
```

fricas [A] time = 0.41, size = 100, normalized size = 1.61

$$\frac{\left(d^2x^2+2\,cdx+c^2-b\log(F)\right)F^{\frac{ad^2x^2+2\,acdx+ac^2+b}{d^2x^2+2\,cdx+c^2}}}{2\left(b^2d^3x^2+2\,b^2cd^2x+b^2c^2d\right)\log(F)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^5,x, algorithm="fricas")
```

```
[Out] 1/2*(d^2*x^2 + 2*c*d*x + c^2 - b*log(F))*F^((a*d^2*x^2 + 2*a*c*d*x + a*c^2
+ b)/(d^2*x^2 + 2*c*d*x + c^2))/((b^2*d^3*x^2 + 2*b^2*c*d^2*x + b^2*c^2*d)*
log(F)^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{(dx+c)^2}}}{(dx+c)^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^5,x, algorithm="giac")
```

[Out] integrate(F^(a + b/(d*x + c)^2)/(d*x + c)^5, x)

maple [B] time = 0.05, size = 185, normalized size = 2.98

$$\frac{\frac{d^3x^4\mathrm{e}^{\left(a+\frac{b}{(dx+c)^2}\right)\ln(F)}}{2b^2\ln(F)^2}+\frac{2c\,d^2x^3\mathrm{e}^{\left(a+\frac{b}{(dx+c)^2}\right)\ln(F)}}{b^2\ln(F)^2}-\frac{\left(b\ln(F)-6c^2\right)d\,x^2\mathrm{e}^{\left(a+\frac{b}{(dx+c)^2}\right)\ln(F)}}{2b^2\ln(F)^2}-\frac{\left(b\ln(F)-2c^2\right)cx\,\mathrm{e}^{\left(a+\frac{b}{(dx+c)^2}\right)\ln(F)}}{b^2\ln(F)^2}-\frac{\left(b\ln(F)-c^2\right)c^2\mathrm{e}^{\left(a+\right.}}{2b^2d\ln(}}{(dx+c)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(F^(a+1/(d*x+c)^2*b)/(d*x+c)^5,x)

[Out] (1/2/b^2/ln(F)^2*d^3*x^4*exp((a+1/(d*x+c)^2*b)*ln(F))-c*(b*ln(F)-2*c^2)/b^2
/ln(F)^2*x*exp((a+1/(d*x+c)^2*b)*ln(F))-1/2*c^2*(b*ln(F)-c^2)/d/b^2/ln(F)^2
*exp((a+1/(d*x+c)^2*b)*ln(F))-1/2*d*(b*ln(F)-6*c^2)/b^2/ln(F)^2*x^2*exp((a+
1/(d*x+c)^2*b)*ln(F))+2*d^2*c/b^2/ln(F)^2*x^3*exp((a+1/(d*x+c)^2*b)*ln(F)))
/(d*x+c)^4

maxima [A] time = 0.98, size = 101, normalized size = 1.63

$$\frac{\left(F^a d^2 x^2 + 2\,F^a c d x + F^a c^2 - F^a b\log(F)\right)F^{\frac{b}{d^2x^2+2\,cdx+c^2}}}{2\left(b^2 d^3 x^2\log(F)^2 + 2\,b^2 c d^2 x\log(F)^2 + b^2 c^2 d\log(F)^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^5,x, algorithm="maxima")

[Out] 1/2*(F^a*d^2*x^2 + 2*F^a*c*d*x + F^a*c^2 - F^a*b*log(F))*F^(b/(d^2*x^2 + 2*
c*d*x + c^2))/(b^2*d^3*x^2*log(F)^2 + 2*b^2*c*d^2*x*log(F)^2 + b^2*c^2*d*lo
g(F)^2)

mupad [B] time = 3.71, size = 97, normalized size = 1.56

$$\frac{F^a\,F^{\frac{b}{c^2+2\,c\,d\,x+d^2\,x^2}}\,\left(\frac{x^2}{2\,b^2\,d\,{\ln(F)}^2}-\frac{b\,\ln(F)-c^2}{2\,b^2\,d^3\,{\ln(F)}^2}+\frac{c\,x}{b^2\,d^2\,{\ln(F)}^2}\right)}{x^2+\frac{c^2}{d^2}+\frac{2\,c\,x}{d}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(F^(a + b/(c + d*x)^2)/(c + d*x)^5,x)

[Out] (F^a*F^(b/(c^2 + d^2*x^2 + 2*c*d*x))*(x^2/(2*b^2*d*log(F)^2) - (b*log(F) -
c^2)/(2*b^2*d^3*log(F)^2) + (c*x)/(b^2*d^2*log(F)^2)))/(x^2 + c^2/d^2 + (2*
c*x)/d)

sympy [A] time = 0.31, size = 82, normalized size = 1.32

$$\frac{F^{a+\frac{b}{(c+dx)^2}}\left(-b\log\left(F\right)+c^2+2cdx+d^2x^2\right)}{2b^2c^2d\log\left(F\right)^2+4b^2cd^2x\log\left(F\right)^2+2b^2d^3x^2\log\left(F\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)/(d*x+c)**5,x)
```

```
[Out] F**(a + b/(c + d*x)**2)*(-b*log(F) + c**2 + 2*c*d*x + d**2*x**2)/(2*b**2*c*
*2*d*log(F)**2 + 4*b**2*c*d**2*x*log(F)**2 + 2*b**2*d**3*x**2*log(F)**2)
```

3.323 $\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^7}\,dx$

Optimal. Leaf size=91

$$-\frac{F^{a+\frac{b}{(c+dx)^2}}}{b^3d\log^3(F)}+\frac{F^{a+\frac{b}{(c+dx)^2}}}{b^2d\log^2(F)(c+dx)^2}-\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd\log(F)(c+dx)^4}$$

```
[Out] -F^(a+b/(d*x+c)^2)/b^3/d/ln(F)^3+F^(a+b/(d*x+c)^2)/b^2/d/(d*x+c)^2/ln(F)^2-
1/2*F^(a+b/(d*x+c)^2)/b/d/(d*x+c)^4/ln(F)
```

Rubi [A] time = 0.14, antiderivative size = 91, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2212, 2209}

$$\frac{F^{a+\frac{b}{(c+dx)^2}}}{b^2d\log^2(F)(c+dx)^2}-\frac{F^{a+\frac{b}{(c+dx)^2}}}{b^3d\log^3(F)}-\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd\log(F)(c+dx)^4}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2)/(c + d*x)^7,x]
```

```
[Out] -(F^(a + b/(c + d*x)^2)/(b^3*d*Log[F]^3)) + F^(a + b/(c + d*x)^2)/(b^2*d*(c
 + d*x)^2*Log[F]^2) - F^(a + b/(c + d*x)^2)/(2*b*d*(c + d*x)^4*Log[F])
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^7}\,dx = -\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)^4\log(F)} - \frac{2\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^5}\,dx}{b\log(F)}$$

$$= \frac{F^{a+\frac{b}{(c+dx)^2}}}{b^2d(c+dx)^2\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)^4\log(F)} + \frac{2\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^3}\,dx}{b^2\log^2(F)}$$

$$= -\frac{F^{a+\frac{b}{(c+dx)^2}}}{b^3d\log^3(F)} + \frac{F^{a+\frac{b}{(c+dx)^2}}}{b^2d(c+dx)^2\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)^4\log(F)}$$

Mathematica [A] time = 0.03, size = 64, normalized size = 0.70

$$-\frac{F^{a+\frac{b}{(c+dx)^2}}\left(b^2\log^2(F) - 2b\log(F)(c+dx)^2 + 2(c+dx)^4\right)}{2b^3d\log^3(F)(c+dx)^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^2)/(c + d*x)^7,x]
```

```
[Out] -1/2*(F^(a + b/(c + d*x)^2)*(2*(c + d*x)^4 - 2*b*(c + d*x)^2*Log[F] + b^2*L
og[F]^2))/(b^3*d*(c + d*x)^4*Log[F]^3)
```

fricas [B] time = 0.41, size = 180, normalized size = 1.98

$$-\frac{\left(2\,d^4x^4 + 8\,cd^3x^3 + 12\,c^2d^2x^2 + 8\,c^3dx + 2\,c^4 + b^2\log(F)^2 - 2\left(bd^2x^2 + 2\,bcdx + bc^2\right)\log(F)\right)F^{\frac{ad^2x^2+2\,acdx+ac^2+b}{d^2x^2+2\,cdx+c^2}}}{2\left(b^3d^5x^4 + 4\,b^3cd^4x^3 + 6\,b^3c^2d^3x^2 + 4\,b^3c^3d^2x + b^3c^4d\right)\log(F)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^7,x, algorithm="fricas")
```

```
[Out] -1/2*(2*d^4*x^4 + 8*c*d^3*x^3 + 12*c^2*d^2*x^2 + 8*c^3*d*x + 2*c^4 + b^2*lo
g(F)^2 - 2*(b*d^2*x^2 + 2*b*c*d*x + b*c^2)*log(F))*F^((a*d^2*x^2 + 2*a*c*d*
x + a*c^2 + b)/(d^2*x^2 + 2*c*d*x + c^2))/((b^3*d^5*x^4 + 4*b^3*c*d^4*x^3 +
 6*b^3*c^2*d^3*x^2 + 4*b^3*c^3*d^2*x + b^3*c^4*d)*log(F)^3)
```

giac [B] time = 0.56, size = 1656, normalized size = 18.20

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^7,x, algorithm="giac")
```

```
[Out] -1/2*((2*(pi^3*b^3*d^3*sgn(F) - 3*pi*b^3*d^3*log(abs(F))^2*sgn(F) - pi^3*b^
3*d^3 + 3*pi*b^3*d^3*log(abs(F))^2)*(pi*b*d^2*sgn(F)/(d*x + c)^2 - pi*b^2*d
^2*log(abs(F))*sgn(F)/(d*x + c)^4 - pi*b*d^2/(d*x + c)^2 + pi*b^2*d^2*log(a
bs(F))/(d*x + c)^4)/((pi^3*b^3*d^3*sgn(F) - 3*pi*b^3*d^3*log(abs(F))^2*sgn(
F) - pi^3*b^3*d^3 + 3*pi*b^3*d^3*log(abs(F))^2)^2 + (3*pi^2*b^3*d^3*log(abs
(F))*sgn(F) - 3*pi^2*b^3*d^3*log(abs(F)) + 2*b^3*d^3*log(abs(F))^3)^2) + (3
*pi^2*b^3*d^3*log(abs(F))*sgn(F) - 3*pi^2*b^3*d^3*log(abs(F)) + 2*b^3*d^3*l
og(abs(F))^3)*(pi^2*b^2*d^2*sgn(F)/(d*x + c)^4 - pi^2*b^2*d^2/(d*x + c)^4 +
 4*d^2 - 4*b*d^2*log(abs(F))/(d*x + c)^2 + 2*b^2*d^2*log(abs(F))^2/(d*x + c
)^4)/((pi^3*b^3*d^3*sgn(F) - 3*pi*b^3*d^3*log(abs(F))^2*sgn(F) - pi^3*b^3*d
^3 + 3*pi*b^3*d^3*log(abs(F))^2)^2 + (3*pi^2*b^3*d^3*log(abs(F))*sgn(F) - 3
*pi^2*b^3*d^3*log(abs(F)) + 2*b^3*d^3*log(abs(F))^3)^2))*cos(-1/2*pi*a*sgn(
F) + 1/2*pi*a - 1/2*pi*b*sgn(F)/(d^2*x^2 + 2*c*d*x + c^2) + 1/2*pi*b/(d^2*x
^2 + 2*c*d*x + c^2)) - (2*(3*pi^2*b^3*d^3*log(abs(F))*sgn(F) - 3*pi^2*b^3*d
^3*log(abs(F)) + 2*b^3*d^3*log(abs(F))^3)*(pi*b*d^2*sgn(F)/(d*x + c)^2 - pi
*b^2*d^2*log(abs(F))*sgn(F)/(d*x + c)^4 - pi*b*d^2/(d*x + c)^2 + pi*b^2*d^2
*log(abs(F))/(d*x + c)^4)/((pi^3*b^3*d^3*sgn(F) - 3*pi*b^3*d^3*log(abs(F))^
2*sgn(F) - pi^3*b^3*d^3 + 3*pi*b^3*d^3*log(abs(F))^2)^2 + (3*pi^2*b^3*d^3*l
og(abs(F))*sgn(F) - 3*pi^2*b^3*d^3*log(abs(F)) + 2*b^3*d^3*log(abs(F))^3)^2
) - (pi^3*b^3*d^3*sgn(F) - 3*pi*b^3*d^3*log(abs(F))^2*sgn(F) - pi^3*b^3*d^3
 + 3*pi*b^3*d^3*log(abs(F))^2)*(pi^2*b^2*d^2*sgn(F)/(d*x + c)^4 - pi^2*b^2*
d^2/(d*x + c)^4 + 4*d^2 - 4*b*d^2*log(abs(F))/(d*x + c)^2 + 2*b^2*d^2*log(a
bs(F))^2/(d*x + c)^4)/((pi^3*b^3*d^3*sgn(F) - 3*pi*b^3*d^3*log(abs(F))^2*sg
n(F) - pi^3*b^3*d^3 + 3*pi*b^3*d^3*log(abs(F))^2)^2 + (3*pi^2*b^3*d^3*log(a
bs(F))*sgn(F) - 3*pi^2*b^3*d^3*log(abs(F)) + 2*b^3*d^3*log(abs(F))^3)^2))*s
in(-1/2*pi*a*sgn(F) + 1/2*pi*a - 1/2*pi*b*sgn(F)/(d^2*x^2 + 2*c*d*x + c^2)
+ 1/2*pi*b/(d^2*x^2 + 2*c*d*x + c^2)))*e^(a*log(abs(F)) + b*log(abs(F))/(d*
x + c)^2) - 1/4*((pi^2*b^2*d^2*i*sgn(F)/(d*x + c)^4 - pi^2*b^2*d^2*i/(d*x +
 c)^4 + 4*d^2*i - 4*b*d^2*i*log(abs(F))/(d*x + c)^2 + 2*b^2*d^2*i*log(abs(F
))^2/(d*x + c)^4 + 2*pi*b*d^2*sgn(F)/(d*x + c)^2 - 2*pi*b^2*d^2*log(abs(F))
*sgn(F)/(d*x + c)^4 - 2*pi*b*d^2/(d*x + c)^2 + 2*pi*b^2*d^2*log(abs(F))/(d*
x + c)^4)*e^(1/2*(pi*a*(sgn(F) - 1) + pi*b*(sgn(F) - 1)/(d*x + c)^2)*i)/(pi
^3*b^3*d^3*i*sgn(F) - 3*pi*b^3*d^3*i*log(abs(F))^2*sgn(F) - pi^3*b^3*d^3*i
+ 3*pi*b^3*d^3*i*log(abs(F))^2 - 3*pi^2*b^3*d^3*log(abs(F))*sgn(F) + 3*pi^2
*b^3*d^3*log(abs(F)) - 2*b^3*d^3*log(abs(F))^3) + (pi^2*b^2*d^2*i*sgn(F)/(d
*x + c)^4 - pi^2*b^2*d^2*i/(d*x + c)^4 + 4*d^2*i - 4*b*d^2*i*log(abs(F))/(d
*x + c)^2 + 2*b^2*d^2*i*log(abs(F))^2/(d*x + c)^4 - 2*pi*b*d^2*sgn(F)/(d*x
+ c)^2 + 2*pi*b^2*d^2*log(abs(F))*sgn(F)/(d*x + c)^4 + 2*pi*b*d^2/(d*x + c)
^2 - 2*pi*b^2*d^2*log(abs(F))/(d*x + c)^4)*e^(-1/2*(pi*a*(sgn(F) - 1) + pi*
b*(sgn(F) - 1)/(d*x + c)^2)*i)/(pi^3*b^3*d^3*i*sgn(F) - 3*pi*b^3*d^3*i*log(
abs(F))^2*sgn(F) - pi^3*b^3*d^3*i + 3*pi*b^3*d^3*i*log(abs(F))^2 + 3*pi^2*b
```

```
^3*d^3*log(abs(F))*sgn(F) - 3*pi^2*b^3*d^3*log(abs(F)) + 2*b^3*d^3*log(abs(
F))^3))*e^(a*log(abs(F)) + b*log(abs(F))/(d*x + c)^2)/i
```

maple [B] time = 0.08, size = 301, normalized size = 3.31

$$-\frac{-\frac{d^5x^6e^{\left(a+\frac{b}{(dx+c)^2}\right)\ln(F)}}{b^3\ln(F)^3}-\frac{6c\,d^4x^5e^{\left(a+\frac{b}{(dx+c)^2}\right)\ln(F)}}{b^3\ln(F)^3}+\frac{\left(b\ln(F)-15c^2\right)d^3x^4e^{\left(a+\frac{b}{(dx+c)^2}\right)\ln(F)}}{b^3\ln(F)^3}+\frac{4\left(b\ln(F)-5c^2\right)c\,d^2x^3e^{\left(a+\frac{b}{(dx+c)^2}\right)\ln(F)}}{b^3\ln(F)^3}-\frac{\left(b^2\ln(F)^2-\right.}{}}{(dx+c)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)^2*b)/(d*x+c)^7,x)
```

```
[Out] (d^3*(b*ln(F)-15*c^2)/ln(F)^3/b^3*x^4*exp((a+1/(d*x+c)^2*b)*ln(F))-d^5/ln(F
)^3/b^3*x^6*exp((a+1/(d*x+c)^2*b)*ln(F))-c*(b^2*ln(F)^2-4*b*c^2*ln(F)+6*c^4
)/b^3/ln(F)^3*x*exp((a+1/(d*x+c)^2*b)*ln(F))-1/2*d*(b^2*ln(F)^2-12*b*c^2*ln
(F)+30*c^4)/ln(F)^3/b^3*x^2*exp((a+1/(d*x+c)^2*b)*ln(F))-6*d^4*c/ln(F)^3/b^
3*x^5*exp((a+1/(d*x+c)^2*b)*ln(F))-1/2*(b^2*ln(F)^2-2*b*c^2*ln(F)+2*c^4)*c^
2/b^3/ln(F)^3/d*exp((a+1/(d*x+c)^2*b)*ln(F))+4*c*d^2*(b*ln(F)-5*c^2)/ln(F)^
3/b^3*x^3*exp((a+1/(d*x+c)^2*b)*ln(F)))/(d*x+c)^6
```

maxima [B] time = 1.01, size = 208, normalized size = 2.29

$$-\frac{\left(2\,F^a d^4x^4+8\,F^a cd^3x^3+2\,F^a c^4-2\,F^a bc^2\log(F)+F^a b^2\log(F)^2+2\left(6\,F^a c^2d^2-F^a bd^2\log(F)\right)x^2+4\left(2\,F^a c^3d-\right.\right.}{2\left(b^3d^5x^4\log(F)^3+4\,b^3cd^4x^3\log(F)^3+6\,b^3c^2d^3x^2\log(F)^3+4\,b^3c^3d^2x\log(F)^3+b^3c^4d\log\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^7,x, algorithm="maxima")
```

```
[Out] -1/2*(2*F^a*d^4*x^4 + 8*F^a*c*d^3*x^3 + 2*F^a*c^4 - 2*F^a*b*c^2*log(F) + F^
a*b^2*log(F)^2 + 2*(6*F^a*c^2*d^2 - F^a*b*d^2*log(F))*x^2 + 4*(2*F^a*c^3*d
- F^a*b*c*d*log(F))*x)*F^(b/(d^2*x^2 + 2*c*d*x + c^2))/(b^3*d^5*x^4*log(F)^
3 + 4*b^3*c*d^4*x^3*log(F)^3 + 6*b^3*c^2*d^3*x^2*log(F)^3 + 4*b^3*c^3*d^2*x
*log(F)^3 + b^3*c^4*d*log(F)^3)
```

mupad [B] time = 3.96, size = 183, normalized size = 2.01

$$-\frac{F^a\,F^{\frac{b}{c^2+2\,c\,d\,x+d^2\,x^2}}\,\left(\frac{x^4}{b^3\,d\,{\ln(F)}^3}+\frac{b^2\,{\ln(F)}^2-2\,b\,c^2\,\ln(F)+2\,c^4}{2\,b^3\,d^5\,{\ln(F)}^3}+\frac{4\,c\,x^3}{b^3\,d^2\,{\ln(F)}^3}-\frac{x^2\,\left(b\,\ln(F)-6\,c^2\right)}{b^3\,d^3\,{\ln(F)}^3}-\frac{2\,c\,x\,\left(b\,\ln(F)-2\,c^2\right)}{b^3\,d^4\,{\ln(F)}^3}\right)}{x^4+\frac{c^4}{d^4}+\frac{4\,c\,x^3}{d}+\frac{4\,c^3\,x}{d^3}+\frac{6\,c^2\,x^2}{d^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)/(c + d*x)^7,x)
```

```
[Out] -(F^a*F^(b/(c^2 + d^2*x^2 + 2*c*d*x))*(x^4/(b^3*d*log(F)^3) + (b^2*log(F)^2
 + 2*c^4 - 2*b*c^2*log(F))/(2*b^3*d^5*log(F)^3) + (4*c*x^3)/(b^3*d^2*log(F)
^3) - (x^2*(b*log(F) - 6*c^2))/(b^3*d^3*log(F)^3) - (2*c*x*(b*log(F) - 2*c^
2))/(b^3*d^4*log(F)^3)))/(x^4 + c^4/d^4 + (4*c*x^3)/d + (4*c^3*x)/d^3 + (6*
c^2*x^2)/d^2)
```

sympy [B] time = 0.39, size = 189, normalized size = 2.08

$$\frac{F^{a+\frac{b}{(c+dx)^2}}\left(-b^2\log(F)^2+2bc^2\log(F)+4bcdx\log(F)+2bd^2x^2\log(F)-2c^4-8c^3dx-12c^2d^2x^2-8cd^3x^3-2d^4\right.}{2b^3c^4d\log(F)^3+8b^3c^3d^2x\log(F)^3+12b^3c^2d^3x^2\log(F)^3+8b^3cd^4x^3\log(F)^3+2b^3d^5x^4\log(F)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)/(d*x+c)**7,x)
```

```
[Out] F**(a + b/(c + d*x)**2)*(-b**2*log(F)**2 + 2*b*c**2*log(F) + 4*b*c*d*x*log(
F) + 2*b*d**2*x**2*log(F) - 2*c**4 - 8*c**3*d*x - 12*c**2*d**2*x**2 - 8*c*d
**3*x**3 - 2*d**4*x**4)/(2*b**3*c**4*d*log(F)**3 + 8*b**3*c**3*d**2*x*log(F
)**3 + 12*b**3*c**2*d**3*x**2*log(F)**3 + 8*b**3*c*d**4*x**3*log(F)**3 + 2*
b**3*d**5*x**4*log(F)**3)
```

3.324 $\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^9} \, dx$

Optimal. Leaf size=126

$$\frac{3F^{a+\frac{b}{(c+dx)^2}}}{b^4d\log^4(F)} - \frac{3F^{a+\frac{b}{(c+dx)^2}}}{b^3d\log^3(F)(c+dx)^2} + \frac{3F^{a+\frac{b}{(c+dx)^2}}}{2b^2d\log^2(F)(c+dx)^4} - \frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd\log(F)(c+dx)^6}$$

```
[Out] 3*F^(a+b/(d*x+c)^2)/b^4/d/ln(F)^4-3*F^(a+b/(d*x+c)^2)/b^3/d/(d*x+c)^2/ln(F)
^3+3/2*F^(a+b/(d*x+c)^2)/b^2/d/(d*x+c)^4/ln(F)^2-1/2*F^(a+b/(d*x+c)^2)/b/d/
(d*x+c)^6/ln(F)
```

Rubi [A] time = 0.19, antiderivative size = 126, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2212, 2209}

$$\frac{3F^{a+\frac{b}{(c+dx)^2}}}{2b^2d\log^2(F)(c+dx)^4} - \frac{3F^{a+\frac{b}{(c+dx)^2}}}{b^3d\log^3(F)(c+dx)^2} + \frac{3F^{a+\frac{b}{(c+dx)^2}}}{b^4d\log^4(F)} - \frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd\log(F)(c+dx)^6}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2)/(c + d*x)^9,x]
```

```
[Out] (3*F^(a + b/(c + d*x)^2))/(b^4*d*Log[F]^4) - (3*F^(a + b/(c + d*x)^2))/(b^3
*d*(c + d*x)^2*Log[F]^3) + (3*F^(a + b/(c + d*x)^2))/(2*b^2*d*(c + d*x)^4*L
og[F]^2) - F^(a + b/(c + d*x)^2)/(2*b*d*(c + d*x)^6*Log[F])
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^9}\,dx = -\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)^6\log(F)} - \frac{3\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^7}\,dx}{b\log(F)}$$

$$= \frac{3F^{a+\frac{b}{(c+dx)^2}}}{2b^2d(c+dx)^4\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)^6\log(F)} + \frac{6\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^5}\,dx}{b^2\log^2(F)}$$

$$= -\frac{3F^{a+\frac{b}{(c+dx)^2}}}{b^3d(c+dx)^2\log^3(F)} + \frac{3F^{a+\frac{b}{(c+dx)^2}}}{2b^2d(c+dx)^4\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)^6\log(F)} - \frac{6\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^3}\,dx}{b^3\log^3(F)}$$

$$= \frac{3F^{a+\frac{b}{(c+dx)^2}}}{b^4d\log^4(F)} - \frac{3F^{a+\frac{b}{(c+dx)^2}}}{b^3d(c+dx)^2\log^3(F)} + \frac{3F^{a+\frac{b}{(c+dx)^2}}}{2b^2d(c+dx)^4\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)^6\log(F)}$$

Mathematica [A] time = 0.04, size = 81, normalized size = 0.64

$$\frac{F^{a+\frac{b}{(c+dx)^2}}\left(-b^3\log^3(F)+3b^2\log^2(F)(c+dx)^2-6b\log(F)(c+dx)^4+6(c+dx)^6\right)}{2b^4d\log^4(F)(c+dx)^6}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^2)/(c + d*x)^9,x]
```

```
[Out] (F^(a + b/(c + d*x)^2)*(6*(c + d*x)^6 - 6*b*(c + d*x)^4*Log[F] + 3*b^2*(c +
 d*x)^2*Log[F]^2 - b^3*Log[F]^3))/(2*b^4*d*(c + d*x)^6*Log[F]^4)
```

fricas [B] time = 0.42, size = 287, normalized size = 2.28

$$\frac{\left(6\,d^6x^6+36\,cd^5x^5+90\,c^2d^4x^4+120\,c^3d^3x^3+90\,c^4d^2x^2+36\,c^5dx+6\,c^6-b^3\log(F)^3+3\left(b^2d^2x^2+2\,b^2cdx+b\right.\right.}{2\left(b^4d^7x^6+6\,b^4cd^6x^5+15\,b^4c^2d^5x^4+20\,b^4c^3d^4x^3+15\,b^4c\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^9,x, algorithm="fricas")
```

```
[Out] 1/2*(6*d^6*x^6 + 36*c*d^5*x^5 + 90*c^2*d^4*x^4 + 120*c^3*d^3*x^3 + 90*c^4*d
^2*x^2 + 36*c^5*d*x + 6*c^6 - b^3*log(F)^3 + 3*(b^2*d^2*x^2 + 2*b^2*c*d*x +
 b^2*c^2)*log(F)^2 - 6*(b*d^4*x^4 + 4*b*c*d^3*x^3 + 6*b*c^2*d^2*x^2 + 4*b*c
```

```
^3*d*x + b*c^4)*log(F))*F^((a*d^2*x^2 + 2*a*c*d*x + a*c^2 + b)/(d^2*x^2 + 2
*c*d*x + c^2))/((b^4*d^7*x^6 + 6*b^4*c*d^6*x^5 + 15*b^4*c^2*d^5*x^4 + 20*b^
4*c^3*d^4*x^3 + 15*b^4*c^4*d^3*x^2 + 6*b^4*c^5*d^2*x + b^4*c^6*d)*log(F)^4)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{(dx+c)^2}}}{(dx+c)^9}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^9,x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c)^2)/(d*x + c)^9, x)
```

maple [B] time = 0.12, size = 444, normalized size = 3.52

$$\frac{\frac{3d^7x^8\mathrm{e}^{\left(a+\frac{b}{(dx+c)^2}\right)\ln(F)}}{b^4\ln(F)^4}+\frac{24c\,d^6x^7\mathrm{e}^{\left(a+\frac{b}{(dx+c)^2}\right)\ln(F)}}{b^4\ln(F)^4}-\frac{3\left(b\ln(F)-28c^2\right)d^5x^6\mathrm{e}^{\left(a+\frac{b}{(dx+c)^2}\right)\ln(F)}}{b^4\ln(F)^4}-\frac{6\left(3b\ln(F)-28c^2\right)c\,d^4x^5\mathrm{e}^{\left(a+\frac{b}{(dx+c)^2}\right)\ln(F)}}{b^4\ln(F)^4}+\frac{3\left(b^2\ln\right.}{}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)^2*b)/(d*x+c)^9,x)
```

```
[Out] (3*d^7/ln(F)^4/b^4*x^8*exp((a+1/(d*x+c)^2*b)*ln(F))-c*(b^3*ln(F)^3-6*b^2*c^
2*ln(F)^2+18*b*c^4*ln(F)-24*c^6)/b^4/ln(F)^4*x*exp((a+1/(d*x+c)^2*b)*ln(F))
-1/2*d*(b^3*ln(F)^3-18*b^2*c^2*ln(F)^2+90*b*c^4*ln(F)-168*c^6)/ln(F)^4/b^4*
x^2*exp((a+1/(d*x+c)^2*b)*ln(F))+3/2*d^3*(b^2*ln(F)^2-30*b*c^2*ln(F)+140*c^
4)/ln(F)^4/b^4*x^4*exp((a+1/(d*x+c)^2*b)*ln(F))-3*d^5*(b*ln(F)-28*c^2)/ln(F
)^4/b^4*x^6*exp((a+1/(d*x+c)^2*b)*ln(F))+24*d^6*c/ln(F)^4/b^4*x^7*exp((a+1/
(d*x+c)^2*b)*ln(F))-1/2*(b^3*ln(F)^3-3*b^2*c^2*ln(F)^2+6*b*c^4*ln(F)-6*c^6)
*c^2/b^4/ln(F)^4/d*exp((a+1/(d*x+c)^2*b)*ln(F))+6*c*d^2*(b^2*ln(F)^2-10*b*c
^2*ln(F)+28*c^4)/ln(F)^4/b^4*x^3*exp((a+1/(d*x+c)^2*b)*ln(F))-6*c*d^4*(3*b*
ln(F)-28*c^2)/ln(F)^4/b^4*x^5*exp((a+1/(d*x+c)^2*b)*ln(F)))/(d*x+c)^8
```

maxima [B] time = 1.08, size = 349, normalized size = 2.77

$$\frac{\left(6\,F^a d^6x^6+36\,F^a c d^5x^5+6\,F^a c^6-6\,F^a b c^4\log(F)+3\,F^a b^2c^2\log(F)^2-F^a b^3\log(F)^3+6\left(15\,F^a c^2d^4-F^a b d^4\log(F\right.\right.}{2\left(b^4d^7x^6\log(F)^4+6\,b^4cd^6x^5\log(F)^4+15\,b^4c^2d\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^9,x, algorithm="maxima")
```

```
[Out] 1/2*(6*F^a*d^6*x^6 + 36*F^a*c*d^5*x^5 + 6*F^a*c^6 - 6*F^a*b*c^4*log(F) + 3*
F^a*b^2*c^2*log(F)^2 - F^a*b^3*log(F)^3 + 6*(15*F^a*c^2*d^4 - F^a*b*d^4*log
(F))*x^4 + 24*(5*F^a*c^3*d^3 - F^a*b*c*d^3*log(F))*x^3 + 3*(30*F^a*c^4*d^2
- 12*F^a*b*c^2*d^2*log(F) + F^a*b^2*d^2*log(F)^2)*x^2 + 6*(6*F^a*c^5*d - 4*
F^a*b*c^3*d*log(F) + F^a*b^2*c*d*log(F)^2)*x)*F^(b/(d^2*x^2 + 2*c*d*x + c^2
))/(b^4*d^7*x^6*log(F)^4 + 6*b^4*c*d^6*x^5*log(F)^4 + 15*b^4*c^2*d^5*x^4*lo
g(F)^4 + 20*b^4*c^3*d^4*x^3*log(F)^4 + 15*b^4*c^4*d^3*x^2*log(F)^4 + 6*b^4*
c^5*d^2*x*log(F)^4 + b^4*c^6*d*log(F)^4)
```

mupad [B] time = 4.25, size = 292, normalized size = 2.32

$$\frac{F^a\,F^{\frac{b}{c^2+2\,c\,d\,x+d^2\,x^2}}\,\left(\frac{3\,x^6}{b^4\,d\,\ln(F)^4}-\frac{b^3\,\ln(F)^3-3\,b^2\,c^2\,\ln(F)^2+6\,b\,c^4\,\ln(F)-6\,c^6}{2\,b^4\,d^7\,\ln(F)^4}+\frac{18\,c\,x^5}{b^4\,d^2\,\ln(F)^4}+\frac{3\,x^2\,\left(b^2\,\ln(F)^2-12\,b\,c^2\,\ln(F)+30\,c^4\right)}{2\,b^4\,d^5\,\ln(F)^4}-\frac{3\,x^4\,\left(b\,\ln\right.}{b^4\,d^3}\right.}{x^6+\frac{c^6}{d^6}+\frac{6\,c\,x^5}{d}+\frac{6\,c^5\,x}{d^5}+\frac{15\,c^2\,x^4}{d^2}+\frac{20\,c^3\,x^3}{d^3}+\frac{15\,c^4\,x^2}{d^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)/(c + d*x)^9,x)
```

```
[Out] (F^a*F^(b/(c^2 + d^2*x^2 + 2*c*d*x))*((3*x^6)/(b^4*d*log(F)^4) - (b^3*log(F
)^3 - 6*c^6 + 6*b*c^4*log(F) - 3*b^2*c^2*log(F)^2)/(2*b^4*d^7*log(F)^4) + (
18*c*x^5)/(b^4*d^2*log(F)^4) + (3*x^2*(b^2*log(F)^2 + 30*c^4 - 12*b*c^2*log
(F)))/(2*b^4*d^5*log(F)^4) - (3*x^4*(b*log(F) - 15*c^2))/(b^4*d^3*log(F)^4)
 - (12*c*x^3*(b*log(F) - 5*c^2))/(b^4*d^4*log(F)^4) + (3*c*x*(b^2*log(F)^2
+ 6*c^4 - 4*b*c^2*log(F)))/(b^4*d^6*log(F)^4)))/(x^6 + c^6/d^6 + (6*c*x^5)/
d + (6*c^5*x)/d^5 + (15*c^2*x^4)/d^2 + (20*c^3*x^3)/d^3 + (15*c^4*x^2)/d^4)
```

sympy [B] time = 0.48, size = 333, normalized size = 2.64

$$\frac{F^{a+\frac{b}{(c+dx)^2}}\left(-b^3\log(F)^3+3b^2c^2\log(F)^2+6b^2cdx\log(F)^2+3b^2d^2x^2\log(F)^2-6bc^4\log(F)-24bc^3dx\log(F)-\right.}{2b^4c^6d\log(F)^4+12b^4c^5d^2x\log(F)^4+30b^4c^4d^3x^2\log(F)^4+40}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)/(d*x+c)**9,x)
```

```
[Out] F**(a + b/(c + d*x)**2)*(-b**3*log(F)**3 + 3*b**2*c**2*log(F)**2 + 6*b**2*c
*d*x*log(F)**2 + 3*b**2*d**2*x**2*log(F)**2 - 6*b*c**4*log(F) - 24*b*c**3*d
*x*log(F) - 36*b*c**2*d**2*x**2*log(F) - 24*b*c*d**3*x**3*log(F) - 6*b*d**4
*x**4*log(F) + 6*c**6 + 36*c**5*d*x + 90*c**4*d**2*x**2 + 120*c**3*d**3*x**
3 + 90*c**2*d**4*x**4 + 36*c*d**5*x**5 + 6*d**6*x**6)/(2*b**4*c**6*d*log(F)
**4 + 12*b**4*c**5*d**2*x*log(F)**4 + 30*b**4*c**4*d**3*x**2*log(F)**4 + 40
*b**4*c**3*d**4*x**3*log(F)**4 + 30*b**4*c**2*d**5*x**4*log(F)**4 + 12*b**4
*c*d**6*x**5*log(F)**4 + 2*b**4*d**7*x**6*log(F)**4)
```

3.325 $\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^{11}}\,dx$

Optimal. Leaf size=96

$$-\frac{F^{a+\frac{b}{(c+dx)^2}}\left(b^4\log^4(F)-4b^3\log^3(F)(c+dx)^2+12b^2\log^2(F)(c+dx)^4-24b\log(F)(c+dx)^6+24(c+dx)^8\right)}{2b^5d\log^5(F)(c+dx)^8}$$

```
[Out] -1/2*F^(a+b/(d*x+c)^2)*(24*(d*x+c)^8-24*b*(d*x+c)^6*ln(F)+12*b^2*(d*x+c)^4*
ln(F)^2-4*b^3*(d*x+c)^2*ln(F)^3+b^4*ln(F)^4)/b^5/d/(d*x+c)^8/ln(F)^5
```

Rubi [C] time = 0.04, antiderivative size = 31, normalized size of antiderivative = 0.32, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2218}

$$-\frac{F^a\text{Gamma}\left(5,-\frac{b\log(F)}{(c+dx)^2}\right)}{2b^5d\log^5(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2)/(c + d*x)^11,x]
```

```
[Out] -(F^a*Gamma[5, -((b*Log[F])/(c + d*x)^2)])/(2*b^5*d*Log[F]^5)
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^{11}}\,dx=-\frac{F^a\Gamma\left(5,-\frac{b\log(F)}{(c+dx)^2}\right)}{2b^5d\log^5(F)}$$

Mathematica [C] time = 0.01, size = 31, normalized size = 0.32

$$-\frac{F^a\Gamma\left(5,-\frac{b\log(F)}{(c+dx)^2}\right)}{2b^5d\log^5(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^2)/(c + d*x)^11,x]
```

```
[Out] -1/2*(F^a*Gamma[5, -((b*Log[F])/(c + d*x)^2)])/(b^5*d*Log[F]^5)
```

fricas [B] time = 0.42, size = 420, normalized size = 4.38

$$-\frac{\left(24\,d^8x^8 + 192\,cd^7x^7 + 672\,c^2d^6x^6 + 1344\,c^3d^5x^5 + 1680\,c^4d^4x^4 + 1344\,c^5d^3x^3 + 672\,c^6d^2x^2 + 192\,c^7dx + 24\,c\right.}{2\left(b^5 d\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^11,x, algorithm="fricas")
```

```
[Out] -1/2*(24*d^8*x^8 + 192*c*d^7*x^7 + 672*c^2*d^6*x^6 + 1344*c^3*d^5*x^5 + 168
0*c^4*d^4*x^4 + 1344*c^5*d^3*x^3 + 672*c^6*d^2*x^2 + 192*c^7*d*x + 24*c^8 +
 b^4*log(F)^4 - 4*(b^3*d^2*x^2 + 2*b^3*c*d*x + b^3*c^2)*log(F)^3 + 12*(b^2*
d^4*x^4 + 4*b^2*c*d^3*x^3 + 6*b^2*c^2*d^2*x^2 + 4*b^2*c^3*d*x + b^2*c^4)*lo
g(F)^2 - 24*(b*d^6*x^6 + 6*b*c*d^5*x^5 + 15*b*c^2*d^4*x^4 + 20*b*c^3*d^3*x^
3 + 15*b*c^4*d^2*x^2 + 6*b*c^5*d*x + b*c^6)*log(F))*F^((a*d^2*x^2 + 2*a*c*d
*x + a*c^2 + b)/(d^2*x^2 + 2*c*d*x + c^2))/((b^5*d^9*x^8 + 8*b^5*c*d^8*x^7
+ 28*b^5*c^2*d^7*x^6 + 56*b^5*c^3*d^6*x^5 + 70*b^5*c^4*d^5*x^4 + 56*b^5*c^5
*d^4*x^3 + 28*b^5*c^6*d^3*x^2 + 8*b^5*c^7*d^2*x + b^5*c^8*d)*log(F)^5)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{(dx+c)^2}}}{(dx+c)^{11}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^11,x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c)^2)/(d*x + c)^11, x)
```

maple [B] time = 0.16, size = 609, normalized size = 6.34

$$\frac{-\frac{12d^9x^{10}e^{\left(a+\frac{b}{(dx+c)^2}\right)\ln(F)}}{b^5\ln(F)^5} - \frac{120c\,d^8x^9e^{\left(a+\frac{b}{(dx+c)^2}\right)\ln(F)}}{b^5\ln(F)^5} + \frac{12\left(b\ln(F)-45c^2\right)d^7x^8e^{\left(a+\frac{b}{(dx+c)^2}\right)\ln(F)}}{b^5\ln(F)^5} + \frac{96\left(b\ln(F)-15c^2\right)c\,d^6x^7e^{\left(a+\frac{b}{(dx+c)^2}\right)\ln(F)}}{b^5\ln(F)^5} - }{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)^2*b)/(d*x+c)^11,x)
```

```
[Out] (-12*d^9/ln(F)^5/b^5*x^10*exp((a+1/(d*x+c)^2*b)*ln(F))-c*(b^4*ln(F)^4-8*b^3
*c^2*ln(F)^3+36*b^2*c^4*ln(F)^2-96*ln(F)*b*c^6+120*c^8)/b^5/ln(F)^5*x*exp((
a+1/(d*x+c)^2*b)*ln(F))-1/2*d*(b^4*ln(F)^4-24*b^3*c^2*ln(F)^3+180*b^2*c^4*l
n(F)^2-672*ln(F)*b*c^6+1080*c^8)/ln(F)^5/b^5*x^2*exp((a+1/(d*x+c)^2*b)*ln(F
))+2*d^3*(b^3*ln(F)^3-45*b^2*c^2*ln(F)^2+420*b*c^4*ln(F)-1260*c^6)/ln(F)^5/
b^5*x^4*exp((a+1/(d*x+c)^2*b)*ln(F))-6*d^5*(b^2*ln(F)^2-56*b*c^2*ln(F)+420*
c^4)/ln(F)^5/b^5*x^6*exp((a+1/(d*x+c)^2*b)*ln(F))+12*d^7*(b*ln(F)-45*c^2)/l
n(F)^5/b^5*x^8*exp((a+1/(d*x+c)^2*b)*ln(F))-120*d^8*c/ln(F)^5/b^5*x^9*exp((
a+1/(d*x+c)^2*b)*ln(F))-1/2*(b^4*ln(F)^4-4*b^3*c^2*ln(F)^3+12*b^2*c^4*ln(F)
^2-24*ln(F)*b*c^6+24*c^8)*c^2/b^5/ln(F)^5/d*exp((a+1/(d*x+c)^2*b)*ln(F))+8*
c*d^2*(b^3*ln(F)^3-15*b^2*c^2*ln(F)^2+84*b*c^4*ln(F)-180*c^6)/ln(F)^5/b^5*x
^3*exp((a+1/(d*x+c)^2*b)*ln(F))-12*c*d^4*(3*b^2*ln(F)^2-56*b*c^2*ln(F)+252*
c^4)/ln(F)^5/b^5*x^5*exp((a+1/(d*x+c)^2*b)*ln(F))+96*c*d^6*(b*ln(F)-15*c^2)
/ln(F)^5/b^5*x^7*exp((a+1/(d*x+c)^2*b)*ln(F)))/(d*x+c)^10
```

maxima [B] time = 1.14, size = 526, normalized size = 5.48

$$-\frac{\left(24\,F^{a}d^{8}x^{8}+192\,F^{a}cd^{7}x^{7}+24\,F^{a}c^{8}-24\,F^{a}bc^{6}\log(F)+12\,F^{a}b^{2}c^{4}\log(F)^{2}-4\,F^{a}b^{3}c^{2}\log(F)^{3}+F^{a}b^{4}\log(F)^{4}+2\cdots\right.}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^11,x, algorithm="maxima")
```

```
[Out] -1/2*(24*F^a*d^8*x^8 + 192*F^a*c*d^7*x^7 + 24*F^a*c^8 - 24*F^a*b*c^6*log(F)
 + 12*F^a*b^2*c^4*log(F)^2 - 4*F^a*b^3*c^2*log(F)^3 + F^a*b^4*log(F)^4 + 24
*(28*F^a*c^2*d^6 - F^a*b*d^6*log(F))*x^6 + 48*(28*F^a*c^3*d^5 - 3*F^a*b*c*d
^5*log(F))*x^5 + 12*(140*F^a*c^4*d^4 - 30*F^a*b*c^2*d^4*log(F) + F^a*b^2*d^
4*log(F)^2)*x^4 + 48*(28*F^a*c^5*d^3 - 10*F^a*b*c^3*d^3*log(F) + F^a*b^2*c*
d^3*log(F)^2)*x^3 + 4*(168*F^a*c^6*d^2 - 90*F^a*b*c^4*d^2*log(F) + 18*F^a*b
^2*c^2*d^2*log(F)^2 - F^a*b^3*d^2*log(F)^3)*x^2 + 8*(24*F^a*c^7*d - 18*F^a*
b*c^5*d*log(F) + 6*F^a*b^2*c^3*d*log(F)^2 - F^a*b^3*c*d*log(F)^3)*x)*F^(b/(
d^2*x^2 + 2*c*d*x + c^2))/(b^5*d^9*x^8*log(F)^5 + 8*b^5*c*d^8*x^7*log(F)^5
+ 28*b^5*c^2*d^7*x^6*log(F)^5 + 56*b^5*c^3*d^6*x^5*log(F)^5 + 70*b^5*c^4*d^
5*x^4*log(F)^5 + 56*b^5*c^5*d^4*x^3*log(F)^5 + 28*b^5*c^6*d^3*x^2*log(F)^5
+ 8*b^5*c^7*d^2*x*log(F)^5 + b^5*c^8*d*log(F)^5)
```

mupad [B] time = 4.57, size = 427, normalized size = 4.45

$$-\frac{F^{a}\,F^{\frac{b}{c^2+2\,c\,d\,x+d^2\,x^2}}\,\left(\frac{b^4\,\ln(F)^4-4\,b^3\,c^2\,\ln(F)^3+12\,b^2\,c^4\,\ln(F)^2-24\,b\,c^6\,\ln(F)+24\,c^8}{2\,b^5\,d^9\,\ln(F)^5}+\frac{12\,x^8}{b^5\,d\,\ln(F)^5}+\frac{96\,c\,x^7}{b^5\,d^2\,\ln(F)^5}-\frac{2\,x^2\,\left(b^3\,\ln(F)^3-18\,b^2\,c^2\,\ln(F)^2+\cdots\right.}{b^5\,d^7\,\ln(F)\cdots}\cdots\right.}{x^8+\frac{c^8}{d^8}\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)/(c + d*x)^11,x)
```

```
[Out] -(F^a*F^(b/(c^2 + d^2*x^2 + 2*c*d*x))*((b^4*log(F)^4 + 24*c^8 - 24*b*c^6*lo
g(F) + 12*b^2*c^4*log(F)^2 - 4*b^3*c^2*log(F)^3)/(2*b^5*d^9*log(F)^5) + (12
*x^8)/(b^5*d*log(F)^5) + (96*c*x^7)/(b^5*d^2*log(F)^5) - (2*x^2*(b^3*log(F)
^3 - 168*c^6 + 90*b*c^4*log(F) - 18*b^2*c^2*log(F)^2))/(b^5*d^7*log(F)^5) +
 (6*x^4*(b^2*log(F)^2 + 140*c^4 - 30*b*c^2*log(F)))/(b^5*d^5*log(F)^5) - (1
2*x^6*(b*log(F) - 28*c^2))/(b^5*d^3*log(F)^5) + (24*c*x^3*(b^2*log(F)^2 + 2
8*c^4 - 10*b*c^2*log(F)))/(b^5*d^6*log(F)^5) - (24*c*x^5*(3*b*log(F) - 28*c
^2))/(b^5*d^4*log(F)^5) - (4*c*x*(b^3*log(F)^3 - 24*c^6 + 18*b*c^4*log(F) -
 6*b^2*c^2*log(F)^2))/(b^5*d^8*log(F)^5)))/(x^8 + c^8/d^8 + (8*c*x^7)/d + (
8*c^7*x)/d^7 + (28*c^2*x^6)/d^2 + (56*c^3*x^5)/d^3 + (70*c^4*x^4)/d^4 + (56
*c^5*x^3)/d^5 + (28*c^6*x^2)/d^6)
```

sympy [B] time = 0.60, size = 518, normalized size = 5.40

$$\frac{F^{a+\frac{b}{(c+dx)^2}}\left(-b^4\log(F)^4+4b^3c^2\log(F)^3+8b^3cdx\log(F)^3+4b^3d^2x^2\log(F)^3-12b^2c^4\log(F)^2-48b^2c^3dx\log(\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)/(d*x+c)**11,x)
```

```
[Out] F**(a + b/(c + d*x)**2)*(-b**4*log(F)**4 + 4*b**3*c**2*log(F)**3 + 8*b**3*c
*d*x*log(F)**3 + 4*b**3*d**2*x**2*log(F)**3 - 12*b**2*c**4*log(F)**2 - 48*b
**2*c**3*d*x*log(F)**2 - 72*b**2*c**2*d**2*x**2*log(F)**2 - 48*b**2*c*d**3*
x**3*log(F)**2 - 12*b**2*d**4*x**4*log(F)**2 + 24*b*c**6*log(F) + 144*b*c**
5*d*x*log(F) + 360*b*c**4*d**2*x**2*log(F) + 480*b*c**3*d**3*x**3*log(F) +
360*b*c**2*d**4*x**4*log(F) + 144*b*c*d**5*x**5*log(F) + 24*b*d**6*x**6*log
(F) - 24*c**8 - 192*c**7*d*x - 672*c**6*d**2*x**2 - 1344*c**5*d**3*x**3 - 1
680*c**4*d**4*x**4 - 1344*c**3*d**5*x**5 - 672*c**2*d**6*x**6 - 192*c*d**7*
x**7 - 24*d**8*x**8)/(2*b**5*c**8*d*log(F)**5 + 16*b**5*c**7*d**2*x*log(F)*
*5 + 56*b**5*c**6*d**3*x**2*log(F)**5 + 112*b**5*c**5*d**4*x**3*log(F)**5 +
 140*b**5*c**4*d**5*x**4*log(F)**5 + 112*b**5*c**3*d**6*x**5*log(F)**5 + 56
*b**5*c**2*d**7*x**6*log(F)**5 + 16*b**5*c*d**8*x**7*log(F)**5 + 2*b**5*d**
9*x**8*log(F)**5)
```

3.326 $\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^{13}}\,dx$

Optimal. Leaf size=113

$$\frac{F^{a+\frac{b}{(c+dx)^2}}\left(-b^5\log^5(F)+5b^4\log^4(F)(c+dx)^2-20b^3\log^3(F)(c+dx)^4+60b^2\log^2(F)(c+dx)^6-120b\log(F)(c+\right.}{2b^6d\log^6(F)(c+dx)^{10}}$$

```
[Out] 1/2*F^(a+b/(d*x+c)^2)*(120*(d*x+c)^10-120*b*(d*x+c)^8*ln(F)+60*b^2*(d*x+c)^
6*ln(F)^2-20*b^3*(d*x+c)^4*ln(F)^3+5*b^4*(d*x+c)^2*ln(F)^4-b^5*ln(F)^5)/b^6
/d/(d*x+c)^10/ln(F)^6
```

Rubi [C] time = 0.05, antiderivative size = 31, normalized size of antiderivative = 0.27, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2218}

$$\frac{F^a\text{Gamma}\left(6,-\frac{b\log(F)}{(c+dx)^2}\right)}{2b^6d\log^6(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2)/(c + d*x)^13,x]
```

```
[Out] (F^a*Gamma[6, -((b*Log[F])/(c + d*x)^2)])/(2*b^6*d*Log[F]^6)
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^{13}}\,dx=\frac{F^a\Gamma\left(6,-\frac{b\log(F)}{(c+dx)^2}\right)}{2b^6d\log^6(F)}$$

Mathematica [C] time = 0.01, size = 31, normalized size = 0.27

$$\frac{F^a\Gamma\left(6,-\frac{b\log(F)}{(c+dx)^2}\right)}{2b^6d\log^6(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^2)/(c + d*x)^13,x]
```

```
[Out] (F^a*Gamma[6, -((b*Log[F])/(c + d*x)^2)])/(2*b^6*d*Log[F]^6)
```

fricas [B] time = 0.44, size = 583, normalized size = 5.16

$$\frac{\left(120\,d^{10}x^{10}+1200\,cd^{9}x^{9}+5400\,c^{2}d^{8}x^{8}+14400\,c^{3}d^{7}x^{7}+25200\,c^{4}d^{6}x^{6}+30240\,c^{5}d^{5}x^{5}+25200\,c^{6}d^{4}x^{4}+1440}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^13,x, algorithm="fricas")
```

```
[Out] 1/2*(120*d^10*x^10 + 1200*c*d^9*x^9 + 5400*c^2*d^8*x^8 + 14400*c^3*d^7*x^7
+ 25200*c^4*d^6*x^6 + 30240*c^5*d^5*x^5 + 25200*c^6*d^4*x^4 + 14400*c^7*d^3
*x^3 + 5400*c^8*d^2*x^2 + 1200*c^9*d*x + 120*c^10 - b^5*log(F)^5 + 5*(b^4*d
^2*x^2 + 2*b^4*c*d*x + b^4*c^2)*log(F)^4 - 20*(b^3*d^4*x^4 + 4*b^3*c*d^3*x^
3 + 6*b^3*c^2*d^2*x^2 + 4*b^3*c^3*d*x + b^3*c^4)*log(F)^3 + 60*(b^2*d^6*x^6
 + 6*b^2*c*d^5*x^5 + 15*b^2*c^2*d^4*x^4 + 20*b^2*c^3*d^3*x^3 + 15*b^2*c^4*d
^2*x^2 + 6*b^2*c^5*d*x + b^2*c^6)*log(F)^2 - 120*(b*d^8*x^8 + 8*b*c*d^7*x^7
 + 28*b*c^2*d^6*x^6 + 56*b*c^3*d^5*x^5 + 70*b*c^4*d^4*x^4 + 56*b*c^5*d^3*x^
3 + 28*b*c^6*d^2*x^2 + 8*b*c^7*d*x + b*c^8)*log(F))*F^((a*d^2*x^2 + 2*a*c*d
*x + a*c^2 + b)/(d^2*x^2 + 2*c*d*x + c^2))/((b^6*d^11*x^10 + 10*b^6*c*d^10*
x^9 + 45*b^6*c^2*d^9*x^8 + 120*b^6*c^3*d^8*x^7 + 210*b^6*c^4*d^7*x^6 + 252*
b^6*c^5*d^6*x^5 + 210*b^6*c^6*d^5*x^4 + 120*b^6*c^7*d^4*x^3 + 45*b^6*c^8*d^
3*x^2 + 10*b^6*c^9*d^2*x + b^6*c^10*d)*log(F)^6)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{(dx+c)^2}}}{(dx+c)^{13}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^13,x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c)^2)/(d*x + c)^13, x)
```

maple [B] time = 0.21, size = 797, normalized size = 7.05

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)^2*b)/(d*x+c)^13,x)
```

```
[Out] (10*c*d^2*(b^4*ln(F)^4-20*b^3*c^2*ln(F)^3+168*b^2*c^4*ln(F)^2-720*b*c^6*ln(
F)+1320*c^8)/ln(F)^6/b^6*x^3*exp((a+1/(d*x+c)^2*b)*ln(F))-60*c*d^4*(b^3*ln(
F)^3-28*b^2*c^2*ln(F)^2+252*b*c^4*ln(F)-792*c^6)/ln(F)^6/b^6*x^5*exp((a+1/(
d*x+c)^2*b)*ln(F))+240*c*d^6*(b^2*ln(F)^2-30*b*c^2*ln(F)+198*c^4)/ln(F)^6/b
^6*x^7*exp((a+1/(d*x+c)^2*b)*ln(F))-600*c*d^8*(b*ln(F)-22*c^2)/ln(F)^6/b^6*
x^9*exp((a+1/(d*x+c)^2*b)*ln(F))+60*d^11/ln(F)^6/b^6*x^12*exp((a+1/(d*x+c)^
2*b)*ln(F))-1/2*(b^5*ln(F)^5-5*ln(F)^4*b^4*c^2+20*ln(F)^3*b^3*c^4-60*b^2*c^
6*ln(F)^2+120*ln(F)*b*c^8-120*c^10)*c^2/b^6/ln(F)^6/d*exp((a+1/(d*x+c)^2*b)
*ln(F))-c*(b^5*ln(F)^5-10*ln(F)^4*b^4*c^2+60*ln(F)^3*b^3*c^4-240*b^2*c^6*ln
(F)^2+600*ln(F)*b*c^8-720*c^10)/b^6/ln(F)^6*x*exp((a+1/(d*x+c)^2*b)*ln(F))-
1/2*d*(b^5*ln(F)^5-30*ln(F)^4*b^4*c^2+300*ln(F)^3*b^3*c^4-1680*b^2*c^6*ln(F
)^2+5400*ln(F)*b*c^8-7920*c^10)/ln(F)^6/b^6*x^2*exp((a+1/(d*x+c)^2*b)*ln(F)
)+5/2*d^3*(b^4*ln(F)^4-60*b^3*c^2*ln(F)^3+840*b^2*c^4*ln(F)^2-5040*b*c^6*ln
(F)+11880*c^8)/ln(F)^6/b^6*x^4*exp((a+1/(d*x+c)^2*b)*ln(F))-10*d^5*(b^3*ln(
F)^3-84*b^2*c^2*ln(F)^2+1260*b*c^4*ln(F)-5544*c^6)/ln(F)^6/b^6*x^6*exp((a+1
/(d*x+c)^2*b)*ln(F))+30*d^7*(b^2*ln(F)^2-90*b*c^2*ln(F)+990*c^4)/ln(F)^6/b^
6*x^8*exp((a+1/(d*x+c)^2*b)*ln(F))-60*d^9*(b*ln(F)-66*c^2)/ln(F)^6/b^6*x^10
*exp((a+1/(d*x+c)^2*b)*ln(F))+720*d^10*c/ln(F)^6/b^6*x^11*exp((a+1/(d*x+c)^
2*b)*ln(F)))/(d*x+c)^12
```

maxima [B] time = 1.19, size = 740, normalized size = 6.55

$$\frac{\left(120\,F^{a}d^{10}x^{10}+1200\,F^{a}cd^{9}x^{9}+120\,F^{a}c^{10}-120\,F^{a}bc^{8}\log(F)+60\,F^{a}b^{2}c^{6}\log(F)^{2}-20\,F^{a}b^{3}c^{4}\log(F)^{3}+5\,F^{a}b^{4}c^{2}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^13,x, algorithm="maxima")
```

```
[Out] 1/2*(120*F^a*d^10*x^10 + 1200*F^a*c*d^9*x^9 + 120*F^a*c^10 - 120*F^a*b*c^8*
log(F) + 60*F^a*b^2*c^6*log(F)^2 - 20*F^a*b^3*c^4*log(F)^3 + 5*F^a*b^4*c^2*
log(F)^4 - F^a*b^5*log(F)^5 + 120*(45*F^a*c^2*d^8 - F^a*b*d^8*log(F))*x^8 +
 960*(15*F^a*c^3*d^7 - F^a*b*c*d^7*log(F))*x^7 + 60*(420*F^a*c^4*d^6 - 56*F
^a*b*c^2*d^6*log(F) + F^a*b^2*d^6*log(F)^2)*x^6 + 120*(252*F^a*c^5*d^5 - 56
*F^a*b*c^3*d^5*log(F) + 3*F^a*b^2*c*d^5*log(F)^2)*x^5 + 20*(1260*F^a*c^6*d^
4 - 420*F^a*b*c^4*d^4*log(F) + 45*F^a*b^2*c^2*d^4*log(F)^2 - F^a*b^3*d^4*lo
g(F)^3)*x^4 + 80*(180*F^a*c^7*d^3 - 84*F^a*b*c^5*d^3*log(F) + 15*F^a*b^2*c^
3*d^3*log(F)^2 - F^a*b^3*c*d^3*log(F)^3)*x^3 + 5*(1080*F^a*c^8*d^2 - 672*F^
a*b*c^6*d^2*log(F) + 180*F^a*b^2*c^4*d^2*log(F)^2 - 24*F^a*b^3*c^2*d^2*log(
F)^3 + F^a*b^4*d^2*log(F)^4)*x^2 + 10*(120*F^a*c^9*d - 96*F^a*b*c^7*d*log(F
) + 36*F^a*b^2*c^5*d*log(F)^2 - 8*F^a*b^3*c^3*d*log(F)^3 + F^a*b^4*c*d*log(
F)^4)*x)*F^(b/(d^2*x^2 + 2*c*d*x + c^2))/(b^6*d^11*x^10*log(F)^6 + 10*b^6*c
*d^10*x^9*log(F)^6 + 45*b^6*c^2*d^9*x^8*log(F)^6 + 120*b^6*c^3*d^8*x^7*log(
```

```
F)^6 + 210*b^6*c^4*d^7*x^6*log(F)^6 + 252*b^6*c^5*d^6*x^5*log(F)^6 + 210*b^
6*c^6*d^5*x^4*log(F)^6 + 120*b^6*c^7*d^4*x^3*log(F)^6 + 45*b^6*c^8*d^3*x^2*
log(F)^6 + 10*b^6*c^9*d^2*x*log(F)^6 + b^6*c^10*d*log(F)^6)
```

mupad [B] time = 4.99, size = 583, normalized size = 5.16

$$F^a\,F^{\frac{b}{c^2+2\,c\,d\,x+d^2\,x^2}}\,\left(\frac{60\,x^{10}}{b^6\,d\,\ln(F)^6}-\frac{b^5\,\ln(F)^5-5\,b^4\,c^2\,\ln(F)^4+20\,b^3\,c^4\,\ln(F)^3-60\,b^2\,c^6\,\ln(F)^2+120\,b\,c^8\,\ln(F)-120\,c^{10}}{2\,b^6\,d^{11}\,\ln(F)^6}+\frac{600\,c\,x^9}{b^6\,d^2\,\ln(F)^6}+\frac{5\,x^2\,\left(b^4\,\ln(F\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)/(c + d*x)^13,x)
```

```
[Out] (F^a*F^(b/(c^2 + d^2*x^2 + 2*c*d*x))*((60*x^10)/(b^6*d*log(F)^6) - (b^5*log
(F)^5 - 120*c^10 + 120*b*c^8*log(F) - 60*b^2*c^6*log(F)^2 + 20*b^3*c^4*log(
F)^3 - 5*b^4*c^2*log(F)^4)/(2*b^6*d^11*log(F)^6) + (600*c*x^9)/(b^6*d^2*log
(F)^6) + (5*x^2*(b^4*log(F)^4 + 1080*c^8 - 672*b*c^6*log(F) + 180*b^2*c^4*l
og(F)^2 - 24*b^3*c^2*log(F)^3))/(2*b^6*d^9*log(F)^6) - (10*x^4*(b^3*log(F)^
3 - 1260*c^6 + 420*b*c^4*log(F) - 45*b^2*c^2*log(F)^2))/(b^6*d^7*log(F)^6)
+ (30*x^6*(b^2*log(F)^2 + 420*c^4 - 56*b*c^2*log(F)))/(b^6*d^5*log(F)^6) -
(60*x^8*(b*log(F) - 45*c^2))/(b^6*d^3*log(F)^6) - (40*c*x^3*(b^3*log(F)^3 -
 180*c^6 + 84*b*c^4*log(F) - 15*b^2*c^2*log(F)^2))/(b^6*d^8*log(F)^6) + (60
*c*x^5*(3*b^2*log(F)^2 + 252*c^4 - 56*b*c^2*log(F)))/(b^6*d^6*log(F)^6) - (
480*c*x^7*(b*log(F) - 15*c^2))/(b^6*d^4*log(F)^6) + (5*c*x*(b^4*log(F)^4 +
120*c^8 - 96*b*c^6*log(F) + 36*b^2*c^4*log(F)^2 - 8*b^3*c^2*log(F)^3))/(b^6
*d^10*log(F)^6)))/(x^10 + c^10/d^10 + (10*c*x^9)/d + (10*c^9*x)/d^9 + (45*c
^2*x^8)/d^2 + (120*c^3*x^7)/d^3 + (210*c^4*x^6)/d^4 + (252*c^5*x^5)/d^5 + (
210*c^6*x^4)/d^6 + (120*c^7*x^3)/d^7 + (45*c^8*x^2)/d^8)
```

sympy [B] time = 0.83, size = 745, normalized size = 6.59

$$F^{a+\frac{b}{(c+dx)^2}}\left(-b^5\log(F)^5+5b^4c^2\log(F)^4+10b^4cdx\log(F)^4+5b^4d^2x^2\log(F)^4-20b^3c^4\log(F)^3-80b^3c^3dx\log\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)/(d*x+c)**13,x)
```

```
[Out] F**(a + b/(c + d*x)**2)*(-b**5*log(F)**5 + 5*b**4*c**2*log(F)**4 + 10*b**4*
c*d*x*log(F)**4 + 5*b**4*d**2*x**2*log(F)**4 - 20*b**3*c**4*log(F)**3 - 80*
b**3*c**3*d*x*log(F)**3 - 120*b**3*c**2*d**2*x**2*log(F)**3 - 80*b**3*c*d**
3*x**3*log(F)**3 - 20*b**3*d**4*x**4*log(F)**3 + 60*b**2*c**6*log(F)**2 + 3
60*b**2*c**5*d*x*log(F)**2 + 900*b**2*c**4*d**2*x**2*log(F)**2 + 1200*b**2*
```

```
c**3*d**3*x**3*log(F)**2 + 900*b**2*c**2*d**4*x**4*log(F)**2 + 360*b**2*c*d
**5*x**5*log(F)**2 + 60*b**2*d**6*x**6*log(F)**2 - 120*b*c**8*log(F) - 960*
b*c**7*d*x*log(F) - 3360*b*c**6*d**2*x**2*log(F) - 6720*b*c**5*d**3*x**3*lo
g(F) - 8400*b*c**4*d**4*x**4*log(F) - 6720*b*c**3*d**5*x**5*log(F) - 3360*b
*c**2*d**6*x**6*log(F) - 960*b*c*d**7*x**7*log(F) - 120*b*d**8*x**8*log(F)
+ 120*c**10 + 1200*c**9*d*x + 5400*c**8*d**2*x**2 + 14400*c**7*d**3*x**3 +
25200*c**6*d**4*x**4 + 30240*c**5*d**5*x**5 + 25200*c**4*d**6*x**6 + 14400*
c**3*d**7*x**7 + 5400*c**2*d**8*x**8 + 1200*c*d**9*x**9 + 120*d**10*x**10)/
(2*b**6*c**10*d*log(F)**6 + 20*b**6*c**9*d**2*x*log(F)**6 + 90*b**6*c**8*d*
*3*x**2*log(F)**6 + 240*b**6*c**7*d**4*x**3*log(F)**6 + 420*b**6*c**6*d**5*
x**4*log(F)**6 + 504*b**6*c**5*d**6*x**5*log(F)**6 + 420*b**6*c**4*d**7*x**
6*log(F)**6 + 240*b**6*c**3*d**8*x**7*log(F)**6 + 90*b**6*c**2*d**9*x**8*lo
g(F)**6 + 20*b**6*c*d**10*x**9*log(F)**6 + 2*b**6*d**11*x**10*log(F)**6)
```

3.327 $\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)^{10}\,dx$

Optimal. Leaf size=49

$$\frac{F^a(c+dx)^{11}\left(-\frac{b\log(F)}{(c+dx)^2}\right)^{11/2}\Gamma\left(-\frac{11}{2},-\frac{b\log(F)}{(c+dx)^2}\right)}{2d}$$

```
[Out] 1/2*F^a*(d*x+c)^11*(64/10395*Pi^(1/2)*erfc((-b*ln(F)/(d*x+c)^2)^(1/2))-64/1
0395/(-b*ln(F)/(d*x+c)^2)^(1/2)*exp(b*ln(F)/(d*x+c)^2)+32/10395/(-b*ln(F)/(
d*x+c)^2)^(3/2)*exp(b*ln(F)/(d*x+c)^2)-16/3465/(-b*ln(F)/(d*x+c)^2)^(5/2)*e
xp(b*ln(F)/(d*x+c)^2)+8/693/(-b*ln(F)/(d*x+c)^2)^(7/2)*exp(b*ln(F)/(d*x+c)^
2)-4/99/(-b*ln(F)/(d*x+c)^2)^(9/2)*exp(b*ln(F)/(d*x+c)^2)+2/11/(-b*ln(F)/(d
*x+c)^2)^(11/2)*exp(b*ln(F)/(d*x+c)^2))*(-b*ln(F)/(d*x+c)^2)^(11/2)/d
```

Rubi [A] time = 0.05, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2218}

$$\frac{F^a(c+dx)^{11}\left(-\frac{b\log(F)}{(c+dx)^2}\right)^{11/2}\text{Gamma}\left(-\frac{11}{2},-\frac{b\log(F)}{(c+dx)^2}\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2)*(c + d*x)^10,x]
```

```
[Out] (F^a*(c + d*x)^11*Gamma[-11/2, -((b*Log[F])/(c + d*x)^2)]*(-((b*Log[F])/(c
+ d*x)^2))^(11/2))/(2*d)
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)^{10}\,dx=\frac{F^a(c+dx)^{11}\Gamma\left(-\frac{11}{2},-\frac{b\log(F)}{(c+dx)^2}\right)\left(-\frac{b\log(F)}{(c+dx)^2}\right)^{11/2}}{2d}$$

Mathematica [A] time = 0.03, size = 49, normalized size = 1.00

$$\frac{F^a(c+dx)^{11}\left(-\frac{b\log(F)}{(c+dx)^2}\right)^{11/2}\Gamma\left(-\frac{11}{2},-\frac{b\log(F)}{(c+dx)^2}\right)}{2d}$$

Antiderivative was successfully verified.

[In] Integrate[F^(a + b/(c + d*x)^2)*(c + d*x)^10,x]

[Out] (F^a*(c + d*x)^11*Gamma[-11/2, -((b*Log[F])/(c + d*x)^2)]*(-((b*Log[F])/(c + d*x)^2))^(11/2))/(2*d)

fricas [B] time = 0.43, size = 561, normalized size = 11.45

$$\frac{32\sqrt{\pi}F^ab^5d\sqrt{-\frac{b\log(F)}{d^2}}\operatorname{erf}\left(\frac{d\sqrt{-\frac{b\log(F)}{d^2}}}{dx+c}\right)\log(F)^5+\left(945\,d^{11}x^{11}+10395\,cd^{10}x^{10}+51975\,c^2d^9x^9+155925\,c^3d^8x^8+\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^10,x, algorithm="fricas")

[Out] 1/10395*(32*sqrt(pi)*F^a*b^5*d*sqrt(-b*log(F)/d^2)*erf(d*sqrt(-b*log(F)/d^2)/(d*x + c))*log(F)^5 + (945*d^11*x^11 + 10395*c*d^10*x^10 + 51975*c^2*d^9*x^9 + 155925*c^3*d^8*x^8 + 311850*c^4*d^7*x^7 + 436590*c^5*d^6*x^6 + 436590*c^6*d^5*x^5 + 311850*c^7*d^4*x^4 + 155925*c^8*d^3*x^3 + 51975*c^9*d^2*x^2 + 10395*c^10*d*x + 945*c^11 + 32*(b^5*d*x + b^5*c)*log(F)^5 + 16*(b^4*d^3*x^3 + 3*b^4*c*d^2*x^2 + 3*b^4*c^2*d*x + b^4*c^3)*log(F)^4 + 24*(b^3*d^5*x^5 + 5*b^3*c*d^4*x^4 + 10*b^3*c^2*d^3*x^3 + 10*b^3*c^3*d^2*x^2 + 5*b^3*c^4*d*x + b^3*c^5)*log(F)^3 + 60*(b^2*d^7*x^7 + 7*b^2*c*d^6*x^6 + 21*b^2*c^2*d^5*x^5 + 35*b^2*c^3*d^4*x^4 + 35*b^2*c^4*d^3*x^3 + 21*b^2*c^5*d^2*x^2 + 7*b^2*c^6*d*x + b^2*c^7)*log(F)^2 + 210*(b*d^9*x^9 + 9*b*c*d^8*x^8 + 36*b*c^2*d^7*x^7 + 84*b*c^3*d^6*x^6 + 126*b*c^4*d^5*x^5 + 126*b*c^5*d^4*x^4 + 84*b*c^6*d^3*x^3 + 36*b*c^7*d^2*x^2 + 9*b*c^8*d*x + b*c^9)*log(F))*F^((a*d^2*x^2 + 2*a*c*d*x + a*c^2 + b)/(d^2*x^2 + 2*c*d*x + c^2)))/d

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)^{10}F^{a+\frac{b}{(dx+c)^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^10,x, algorithm="giac")

```
[Out] integrate((d*x + c)^10*F^(a + b/(d*x + c)^2), x)
```

maple [B] time = 0.18, size = 1173, normalized size = 23.94

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)^2*b)*(d*x+c)^10,x)
```

```
[Out] F^a*F^(1/(d*x+c)^2*b)*c^10*x+1/11*F^a*d^10*F^(1/(d*x+c)^2*b)*x^11+1/11*F^a/
d*F^(1/(d*x+c)^2*b)*c^11+4/693*F^a/d*b^2*ln(F)^2*F^(1/(d*x+c)^2*b)*c^7+8/34
65*F^a/d*b^3*ln(F)^3*F^(1/(d*x+c)^2*b)*c^5+16/10395*F^a/d*b^4*ln(F)^4*F^(1/
(d*x+c)^2*b)*c^3+32/10395*F^a/d*b^5*ln(F)^5*F^(1/(d*x+c)^2*b)*c+2/99*F^a/d*
b*ln(F)*F^(1/(d*x+c)^2*b)*c^9+4/693*F^a*d^6*b^2*ln(F)^2*F^(1/(d*x+c)^2*b)*x
^7+8/3465*F^a*d^4*b^3*ln(F)^3*F^(1/(d*x+c)^2*b)*x^5+16/10395*F^a*d^2*b^4*ln
(F)^4*F^(1/(d*x+c)^2*b)*x^3+2/99*F^a*d^8*b*ln(F)*F^(1/(d*x+c)^2*b)*x^9+2/11
*F^a*b*ln(F)*F^(1/(d*x+c)^2*b)*c^8*x+4/99*F^a*b^2*ln(F)^2*F^(1/(d*x+c)^2*b)
*c^6*x+8/693*F^a*b^3*ln(F)^3*F^(1/(d*x+c)^2*b)*c^4*x+16/3465*F^a*b^4*ln(F)^
4*F^(1/(d*x+c)^2*b)*c^2*x+32/10395*F^a*b^5*ln(F)^5*F^(1/(d*x+c)^2*b)*x+F^a*
d^9*F^(1/(d*x+c)^2*b)*c*x^10+5*F^a*d^8*F^(1/(d*x+c)^2*b)*c^2*x^9+15*F^a*d^7
*F^(1/(d*x+c)^2*b)*c^3*x^8+30*F^a*d^6*F^(1/(d*x+c)^2*b)*c^4*x^7+42*F^a*d^5*
F^(1/(d*x+c)^2*b)*c^5*x^6+42*F^a*d^4*F^(1/(d*x+c)^2*b)*c^6*x^5+30*F^a*d^3*F
^(1/(d*x+c)^2*b)*c^7*x^4+15*F^a*d^2*F^(1/(d*x+c)^2*b)*c^8*x^3+5*F^a*d*F^(1/
(d*x+c)^2*b)*c^9*x^2+2/11*F^a*d^7*b*ln(F)*F^(1/(d*x+c)^2*b)*c*x^8+8/11*F^a*
d^6*b*ln(F)*F^(1/(d*x+c)^2*b)*c^2*x^7+56/33*F^a*d^5*b*ln(F)*F^(1/(d*x+c)^2*
b)*c^3*x^6+28/11*F^a*d^4*b*ln(F)*F^(1/(d*x+c)^2*b)*c^4*x^5+28/11*F^a*d^3*b*
ln(F)*F^(1/(d*x+c)^2*b)*c^5*x^4+56/33*F^a*d^2*b*ln(F)*F^(1/(d*x+c)^2*b)*c^6
*x^3+8/11*F^a*d*b*ln(F)*F^(1/(d*x+c)^2*b)*c^7*x^2+4/99*F^a*d^5*b^2*ln(F)^2*
F^(1/(d*x+c)^2*b)*c*x^6+4/33*F^a*d^4*b^2*ln(F)^2*F^(1/(d*x+c)^2*b)*c^2*x^5+
20/99*F^a*d^3*b^2*ln(F)^2*F^(1/(d*x+c)^2*b)*c^3*x^4+20/99*F^a*d^2*b^2*ln(F)
^2*F^(1/(d*x+c)^2*b)*c^4*x^3+4/33*F^a*d*b^2*ln(F)^2*F^(1/(d*x+c)^2*b)*c^5*x
^2+8/693*F^a*d^3*b^3*ln(F)^3*F^(1/(d*x+c)^2*b)*c*x^4+16/693*F^a*d^2*b^3*ln(
F)^3*F^(1/(d*x+c)^2*b)*c^2*x^3+16/693*F^a*d*b^3*ln(F)^3*F^(1/(d*x+c)^2*b)*c
^3*x^2+16/3465*F^a*d*b^4*ln(F)^4*F^(1/(d*x+c)^2*b)*c*x^2-32/10395*F^a/d*b^6
*ln(F)^6*Pi^(1/2)/(-b*ln(F))^(1/2)*erf((-b*ln(F))^(1/2)/(d*x+c))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{10395}\left(945\,F^{a}d^{10}x^{11}+10395\,F^{a}cd^{9}x^{10}+105\left(495\,F^{a}c^{2}d^{8}+2\,F^{a}bd^{8}\log(F)\right)x^{9}+945\left(165\,F^{a}c^{3}d^{7}+2\,F^{a}bcd^{7}\log\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^10,x, algorithm="maxima")
```

```
[Out] 1/10395*(945*F^a*d^10*x^11 + 10395*F^a*c*d^9*x^10 + 105*(495*F^a*c^2*d^8 +
2*F^a*b*d^8*log(F))*x^9 + 945*(165*F^a*c^3*d^7 + 2*F^a*b*c*d^7*log(F))*x^8
+ 30*(10395*F^a*c^4*d^6 + 252*F^a*b*c^2*d^6*log(F) + 2*F^a*b^2*d^6*log(F)^2
)*x^7 + 210*(2079*F^a*c^5*d^5 + 84*F^a*b*c^3*d^5*log(F) + 2*F^a*b^2*c*d^5*l
og(F)^2)*x^6 + 6*(72765*F^a*c^6*d^4 + 4410*F^a*b*c^4*d^4*log(F) + 210*F^a*b
^2*c^2*d^4*log(F)^2 + 4*F^a*b^3*d^4*log(F)^3)*x^5 + 30*(10395*F^a*c^7*d^3 +
 882*F^a*b*c^5*d^3*log(F) + 70*F^a*b^2*c^3*d^3*log(F)^2 + 4*F^a*b^3*c*d^3*l
og(F)^3)*x^4 + (155925*F^a*c^8*d^2 + 17640*F^a*b*c^6*d^2*log(F) + 2100*F^a*
b^2*c^4*d^2*log(F)^2 + 240*F^a*b^3*c^2*d^2*log(F)^3 + 16*F^a*b^4*d^2*log(F)
^4)*x^3 + 3*(17325*F^a*c^9*d + 2520*F^a*b*c^7*d*log(F) + 420*F^a*b^2*c^5*d*
log(F)^2 + 80*F^a*b^3*c^3*d*log(F)^3 + 16*F^a*b^4*c*d*log(F)^4)*x^2 + (1039
5*F^a*c^10 + 1890*F^a*b*c^8*log(F) + 420*F^a*b^2*c^6*log(F)^2 + 120*F^a*b^3
*c^4*log(F)^3 + 48*F^a*b^4*c^2*log(F)^4 + 32*F^a*b^5*log(F)^5)*x)*F^(b/(d^2
*x^2 + 2*c*d*x + c^2)) + integrate(2/10395*(32*F^a*b^6*d*x*log(F)^6 - 945*F
^a*b*c^11*log(F) - 210*F^a*b^2*c^9*log(F)^2 - 60*F^a*b^3*c^7*log(F)^3 - 24*
F^a*b^4*c^5*log(F)^4 - 16*F^a*b^5*c^3*log(F)^5)*F^(b/(d^2*x^2 + 2*c*d*x + c
^2))/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3), x)
```

mupad [B] time = 4.35, size = 265, normalized size = 5.41

$$\frac{F^a\,F^{\frac{b}{{(c+d\,x)}^2}}\,{(c+d\,x)}^{11}}{11\,d}-\frac{32\,F^a\,\sqrt{\pi }\,{(c+d\,x)}^{11}\,{\left(-\frac{b\,\ln (F)}{{(c+d\,x)}^2}\right)}^{11/2}}{10395\,d}+\frac{4\,F^a\,F^{\frac{b}{{(c+d\,x)}^2}}\,b^2\,{\ln (F)}^2\,{(c+d\,x)}^7}{693\,d}+\frac{8\,F^a\,F^{\frac{b}{{(c+d\,x)}^2}}\,b^3\,{\ln (F)}^3}{3465\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)*(c + d*x)^10,x)
```

```
[Out] (F^a*F^(b/(c + d*x)^2)*(c + d*x)^11)/(11*d) - (32*F^a*pi^(1/2)*(c + d*x)^11
*(-(b*log(F))/(c + d*x)^2)^(11/2))/(10395*d) + (4*F^a*F^(b/(c + d*x)^2)*b^2
*log(F)^2*(c + d*x)^7)/(693*d) + (8*F^a*F^(b/(c + d*x)^2)*b^3*log(F)^3*(c +
 d*x)^5)/(3465*d) + (16*F^a*F^(b/(c + d*x)^2)*b^4*log(F)^4*(c + d*x)^3)/(10
395*d) + (2*F^a*F^(b/(c + d*x)^2)*b*log(F)*(c + d*x)^9)/(99*d) + (32*F^a*F^
(b/(c + d*x)^2)*b^5*log(F)^5*(c + d*x))/(10395*d) + (32*F^a*pi^(1/2)*erfc((
-(b*log(F))/(c + d*x)^2)^(1/2))*(c + d*x)^11*(-(b*log(F))/(c + d*x)^2)^(11/
2))/(10395*d)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)*(d*x+c)**10,x)
```

```
[Out] Timed out
```

3.328 $\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)^8\,dx$

Optimal. Leaf size=49

$$\frac{F^a(c+dx)^9\left(-\frac{b\log(F)}{(c+dx)^2}\right)^{9/2}\Gamma\left(-\frac{9}{2},-\frac{b\log(F)}{(c+dx)^2}\right)}{2d}$$

```
[Out] 1/2*F^a*(d*x+c)^9*(-32/945*Pi^(1/2)*erfc((-b*ln(F)/(d*x+c)^2)^(1/2))+32/945
/(-b*ln(F)/(d*x+c)^2)^(1/2)*exp(b*ln(F)/(d*x+c)^2)-16/945/(-b*ln(F)/(d*x+c)
^2)^(3/2)*exp(b*ln(F)/(d*x+c)^2)+8/315/(-b*ln(F)/(d*x+c)^2)^(5/2)*exp(b*ln(
F)/(d*x+c)^2)-4/63/(-b*ln(F)/(d*x+c)^2)^(7/2)*exp(b*ln(F)/(d*x+c)^2)+2/9/(-
b*ln(F)/(d*x+c)^2)^(9/2)*exp(b*ln(F)/(d*x+c)^2))*(-b*ln(F)/(d*x+c)^2)^(9/2)
/d
```

Rubi [A] time = 0.05, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2218}

$$\frac{F^a(c+dx)^9\left(-\frac{b\log(F)}{(c+dx)^2}\right)^{9/2}\text{Gamma}\left(-\frac{9}{2},-\frac{b\log(F)}{(c+dx)^2}\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2)*(c + d*x)^8,x]
```

```
[Out] (F^a*(c + d*x)^9*Gamma[-9/2, -((b*Log[F])/(c + d*x)^2)]*(-((b*Log[F])/(c +
d*x)^2))^(9/2))/(2*d)
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)^8\,dx=\frac{F^a(c+dx)^9\Gamma\left(-\frac{9}{2},-\frac{b\log(F)}{(c+dx)^2}\right)\left(-\frac{b\log(F)}{(c+dx)^2}\right)^{9/2}}{2d}$$

Mathematica [A] time = 0.03, size = 49, normalized size = 1.00

$$\frac{F^a(c+dx)^9\left(-\frac{b\log(F)}{(c+dx)^2}\right)^{9/2}\Gamma\left(-\frac{9}{2},-\frac{b\log(F)}{(c+dx)^2}\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^2)*(c + d*x)^8,x]
```

```
[Out] (F^a*(c + d*x)^9*Gamma[-9/2, -((b*Log[F])/(c + d*x)^2)]*(-((b*Log[F])/(c + 
d*x)^2))^(9/2))/(2*d)
```

fricas [B] time = 0.41, size = 413, normalized size = 8.43

$$16\sqrt{\pi}F^ab^4d\sqrt{-\frac{b\log(F)}{d^2}}\,\mathrm{erf}\left(\frac{d\sqrt{-\frac{b\log(F)}{d^2}}}{dx+c}\right)\log(F)^4+\left(105\,d^9x^9+945\,cd^8x^8+3780\,c^2d^7x^7+8820\,c^3d^6x^6+13230\,c^4\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^8,x, algorithm="fricas")
```

```
[Out] 1/945*(16*sqrt(pi)*F^a*b^4*d*sqrt(-b*log(F)/d^2)*erf(d*sqrt(-b*log(F)/d^2)/
(d*x + c))*log(F)^4 + (105*d^9*x^9 + 945*c*d^8*x^8 + 3780*c^2*d^7*x^7 + 882
0*c^3*d^6*x^6 + 13230*c^4*d^5*x^5 + 13230*c^5*d^4*x^4 + 8820*c^6*d^3*x^3 + 
3780*c^7*d^2*x^2 + 945*c^8*d*x + 105*c^9 + 16*(b^4*d*x + b^4*c)*log(F)^4 + 
8*(b^3*d^3*x^3 + 3*b^3*c*d^2*x^2 + 3*b^3*c^2*d*x + b^3*c^3)*log(F)^3 + 12*(
b^2*d^5*x^5 + 5*b^2*c*d^4*x^4 + 10*b^2*c^2*d^3*x^3 + 10*b^2*c^3*d^2*x^2 + 5
*b^2*c^4*d*x + b^2*c^5)*log(F)^2 + 30*(b*d^7*x^7 + 7*b*c*d^6*x^6 + 21*b*c^2
*d^5*x^5 + 35*b*c^3*d^4*x^4 + 35*b*c^4*d^3*x^3 + 21*b*c^5*d^2*x^2 + 7*b*c^6
*d*x + b*c^7)*log(F))*F^((a*d^2*x^2 + 2*a*c*d*x + a*c^2 + b)/(d^2*x^2 + 2*c
*d*x + c^2)))/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int(dx+c)^8F^{a+\frac{b}{(dx+c)^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^8,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^8*F^(a + b/(d*x + c)^2), x)
```

maple [B] time = 0.12, size = 826, normalized size = 16.86

$$\frac{d^8x^9F^aF^{\frac{b}{(dx+c)^2}}}{9}+c\,d^7x^8F^aF^{\frac{b}{(dx+c)^2}}+\frac{2b\,d^6x^7F^aF^{\frac{b}{(dx+c)^2}}\ln(F)}{63}+4c^2d^6x^7F^aF^{\frac{b}{(dx+c)^2}}+\frac{2bc\,d^5x^6F^aF^{\frac{b}{(dx+c)^2}}\ln(F)}{9}+\frac{28c^3d^5x^6}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)^2*b)*(d*x+c)^8,x)
```

```
[Out] 4*F^a*d^6*F^(1/(d*x+c)^2*b)*c^2*x^7+28/3*F^a*d^5*F^(1/(d*x+c)^2*b)*c^3*x^6+
14*F^a*d^4*F^(1/(d*x+c)^2*b)*c^4*x^5+14*F^a*d^3*F^(1/(d*x+c)^2*b)*c^5*x^4+2
8/3*F^a*d^2*F^(1/(d*x+c)^2*b)*c^6*x^3+4*F^a*d*F^(1/(d*x+c)^2*b)*c^7*x^2+16/
945*F^a*b^4*ln(F)^4*F^(1/(d*x+c)^2*b)*x+F^a*d^7*F^(1/(d*x+c)^2*b)*c*x^8+4/6
3*F^a*d^3*b^2*ln(F)^2*F^(1/(d*x+c)^2*b)*c*x^4+8/63*F^a*d^2*b^2*ln(F)^2*F^(1
/(d*x+c)^2*b)*c^2*x^3+8/63*F^a*d*b^2*ln(F)^2*F^(1/(d*x+c)^2*b)*c^3*x^2+8/31
5*F^a*d*b^3*ln(F)^3*F^(1/(d*x+c)^2*b)*c*x^2-16/945*F^a/d*b^5*ln(F)^5*Pi^(1/
2)/(-b*ln(F))^(1/2)*erf((-b*ln(F))^(1/2)/(d*x+c))+2/9*F^a*d^5*b*ln(F)*F^(1/
(d*x+c)^2*b)*c*x^6+8/945*F^a*d^2*b^3*ln(F)^3*F^(1/(d*x+c)^2*b)*x^3+4/63*F^a
*b^2*ln(F)^2*F^(1/(d*x+c)^2*b)*c^4*x+8/315*F^a*b^3*ln(F)^3*F^(1/(d*x+c)^2*b
)*c^2*x+2/9*F^a*b*ln(F)*F^(1/(d*x+c)^2*b)*c^6*x+2/63*F^a/d*b*ln(F)*F^(1/(d*
x+c)^2*b)*c^7+4/315*F^a/d*b^2*ln(F)^2*F^(1/(d*x+c)^2*b)*c^5+8/945*F^a/d*b^3
*ln(F)^3*F^(1/(d*x+c)^2*b)*c^3+16/945*F^a/d*b^4*ln(F)^4*F^(1/(d*x+c)^2*b)*c
+2/63*F^a*d^6*b*ln(F)*F^(1/(d*x+c)^2*b)*x^7+4/315*F^a*d^4*b^2*ln(F)^2*F^(1/
(d*x+c)^2*b)*x^5+F^a*F^(1/(d*x+c)^2*b)*c^8*x+1/9*F^a/d*F^(1/(d*x+c)^2*b)*c^
9+1/9*F^a*d^8*F^(1/(d*x+c)^2*b)*x^9+2/3*F^a*d^4*b*ln(F)*F^(1/(d*x+c)^2*b)*c
^2*x^5+10/9*F^a*d^3*b*ln(F)*F^(1/(d*x+c)^2*b)*c^3*x^4+10/9*F^a*d^2*b*ln(F)*
F^(1/(d*x+c)^2*b)*c^4*x^3+2/3*F^a*d*b*ln(F)*F^(1/(d*x+c)^2*b)*c^5*x^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{945}\Big(105\,F^ad^8x^9+945\,F^acd^7x^8+30\left(126\,F^ac^2d^6+F^abd^6\log(F)\right)x^7+210\left(42\,F^ac^3d^5+F^abcd^5\log(F)\right)x^6+6\,(2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^8,x, algorithm="maxima")
```

```
[Out] 1/945*(105*F^a*d^8*x^9 + 945*F^a*c*d^7*x^8 + 30*(126*F^a*c^2*d^6 + F^a*b*d^
6*log(F))*x^7 + 210*(42*F^a*c^3*d^5 + F^a*b*c*d^5*log(F))*x^6 + 6*(2205*F^a
*c^4*d^4 + 105*F^a*b*c^2*d^4*log(F) + 2*F^a*b^2*d^4*log(F)^2)*x^5 + 30*(441
*F^a*c^5*d^3 + 35*F^a*b*c^3*d^3*log(F) + 2*F^a*b^2*c*d^3*log(F)^2)*x^4 + 2*
(4410*F^a*c^6*d^2 + 525*F^a*b*c^4*d^2*log(F) + 60*F^a*b^2*c^2*d^2*log(F)^2
+ 4*F^a*b^3*d^2*log(F)^3)*x^3 + 6*(630*F^a*c^7*d + 105*F^a*b*c^5*d*log(F) +
 20*F^a*b^2*c^3*d*log(F)^2 + 4*F^a*b^3*c*d*log(F)^3)*x^2 + (945*F^a*c^8 + 2
```

```
10*F^a*b*c^6*log(F) + 60*F^a*b^2*c^4*log(F)^2 + 24*F^a*b^3*c^2*log(F)^3 + 1
6*F^a*b^4*log(F)^4)*x)*F^(b/(d^2*x^2 + 2*c*d*x + c^2)) + integrate(2/945*(1
6*F^a*b^5*d*x*log(F)^5 - 105*F^a*b*c^9*log(F) - 30*F^a*b^2*c^7*log(F)^2 - 1
2*F^a*b^3*c^5*log(F)^3 - 8*F^a*b^4*c^3*log(F)^4)*F^(b/(d^2*x^2 + 2*c*d*x +
c^2))/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3), x)
```

mupad [B] time = 4.17, size = 232, normalized size = 4.73

$$\frac{F^a F^{\frac{b}{(c+dx)^2}} (c+dx)^9}{9d} + \frac{16 F^a \sqrt{\pi}\, (c+dx)^9 \left(-\frac{b \ln(F)}{(c+dx)^2}\right)^{9/2}}{945 d} + \frac{4 F^a F^{\frac{b}{(c+dx)^2}} b^2 \ln(F)^2 (c+dx)^5}{315 d} + \frac{8 F^a F^{\frac{b}{(c+dx)^2}} b^3 \ln(F)^3 (c}{945 d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)*(c + d*x)^8,x)
```

```
[Out] (F^a*F^(b/(c + d*x)^2)*(c + d*x)^9)/(9*d) + (16*F^a*pi^(1/2)*(c + d*x)^9*(-
(b*log(F))/(c + d*x)^2)^(9/2))/(945*d) + (4*F^a*F^(b/(c + d*x)^2)*b^2*log(F
)^2*(c + d*x)^5)/(315*d) + (8*F^a*F^(b/(c + d*x)^2)*b^3*log(F)^3*(c + d*x)^
3)/(945*d) + (2*F^a*F^(b/(c + d*x)^2)*b*log(F)*(c + d*x)^7)/(63*d) + (16*F^
a*F^(b/(c + d*x)^2)*b^4*log(F)^4*(c + d*x))/(945*d) - (16*F^a*pi^(1/2)*erfc
((-(b*log(F))/(c + d*x)^2)^(1/2))*(c + d*x)^9*(-(b*log(F))/(c + d*x)^2)^(9/
2))/(945*d)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)*(d*x+c)**8,x)
```

```
[Out] Timed out
```

3.329 $\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)^6\,dx$

Optimal. Leaf size=170

$$-\frac{8\sqrt{\pi}\,b^{7/2}F^a\log^{\frac{7}{2}}(F)\text{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(F)}}{c+dx}\right)}{105d}+\frac{8b^3\log^3(F)(c+dx)F^{a+\frac{b}{(c+dx)^2}}}{105d}+\frac{4b^2\log^2(F)(c+dx)^3F^{a+\frac{b}{(c+dx)^2}}}{105d}+\frac{(c+dx)^7F}{7d}$$

```
[Out] 1/7*F^(a+b/(d*x+c)^2)*(d*x+c)^7/d+2/35*b*F^(a+b/(d*x+c)^2)*(d*x+c)^5*ln(F)/
d+4/105*b^2*F^(a+b/(d*x+c)^2)*(d*x+c)^3*ln(F)^2/d+8/105*b^3*F^(a+b/(d*x+c)^
2)*(d*x+c)*ln(F)^3/d-8/105*b^(7/2)*F^a*erfi(b^(1/2)*ln(F)^(1/2)/(d*x+c))*ln
(F)^(7/2)*Pi^(1/2)/d
```

Rubi [A] time = 0.23, antiderivative size = 170, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {2214, 2206, 2211, 2204}

$$-\frac{8\sqrt{\pi}\,b^{7/2}F^a\log^{\frac{7}{2}}(F)\text{Erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(F)}}{c+dx}\right)}{105d}+\frac{8b^3\log^3(F)(c+dx)F^{a+\frac{b}{(c+dx)^2}}}{105d}+\frac{4b^2\log^2(F)(c+dx)^3F^{a+\frac{b}{(c+dx)^2}}}{105d}+\frac{(c+dx)^7F}{7d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2)*(c + d*x)^6,x]
```

```
[Out] (F^(a + b/(c + d*x)^2)*(c + d*x)^7)/(7*d) + (2*b*F^(a + b/(c + d*x)^2)*(c +
 d*x)^5*Log[F])/(35*d) + (4*b^2*F^(a + b/(c + d*x)^2)*(c + d*x)^3*Log[F]^2)
/(105*d) + (8*b^3*F^(a + b/(c + d*x)^2)*(c + d*x)*Log[F]^3)/(105*d) - (8*b^
(7/2)*F^a*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[F]])/(c + d*x)]*Log[F]^(7/2))/(10
5*d)
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2206

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[((c +
 d*x)*F^(a + b*(c + d*x)^n))/d, x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2211

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)^6\,dx = \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^7}{7d} + \frac{1}{7}(2b\log(F))\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)^4\,dx$$

$$= \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^7}{7d} + \frac{2bF^{a+\frac{b}{(c+dx)^2}}(c+dx)^5\log(F)}{35d} + \frac{1}{35}\left(4b^2\log^2(F)\right)\int F^{a+\frac{b}{(c+dx)^2}}(c+$$

$$= \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^7}{7d} + \frac{2bF^{a+\frac{b}{(c+dx)^2}}(c+dx)^5\log(F)}{35d} + \frac{4b^2F^{a+\frac{b}{(c+dx)^2}}(c+dx)^3\log^2(F)}{105d} + \frac{}{1}$$

$$= \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^7}{7d} + \frac{2bF^{a+\frac{b}{(c+dx)^2}}(c+dx)^5\log(F)}{35d} + \frac{4b^2F^{a+\frac{b}{(c+dx)^2}}(c+dx)^3\log^2(F)}{105d} + \frac{8}{}$$

$$= \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^7}{7d} + \frac{2bF^{a+\frac{b}{(c+dx)^2}}(c+dx)^5\log(F)}{35d} + \frac{4b^2F^{a+\frac{b}{(c+dx)^2}}(c+dx)^3\log^2(F)}{105d} + \frac{8}{}$$

$$= \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^7}{7d} + \frac{2bF^{a+\frac{b}{(c+dx)^2}}(c+dx)^5\log(F)}{35d} + \frac{4b^2F^{a+\frac{b}{(c+dx)^2}}(c+dx)^3\log^2(F)}{105d} + \frac{8}{}$$

Mathematica [A] time = 0.13, size = 113, normalized size = 0.66

$$\frac{F^a\left((c+dx)F^{\frac{b}{(c+dx)^2}}\left(8b^3\log^3(F)+4b^2\log^2(F)(c+dx)^2+6b\log(F)(c+dx)^4+15(c+dx)^6\right)-8\sqrt{\pi}\,b^{7/2}\log^{\frac{7}{2}}(F)\text{er}}{105d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^2)*(c + d*x)^6,x]
```

```
[Out] (F^a*(-8*b^(7/2)*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[F]])/(c + d*x)]*Log[F]^(7/
2) + F^(b/(c + d*x)^2)*(c + d*x)*(15*(c + d*x)^6 + 6*b*(c + d*x)^4*Log[F] +
 4*b^2*(c + d*x)^2*Log[F]^2 + 8*b^3*Log[F]^3)))/(105*d)
```

fricas [A] time = 0.41, size = 293, normalized size = 1.72

$$\frac{8\sqrt{\pi}F^{a}b^{3}d\sqrt{-\frac{b\log(F)}{d^{2}}}\operatorname{erf}\left(\frac{d\sqrt{-\frac{b\log(F)}{d^{2}}}}{dx+c}\right)\log(F)^{3}+\left(15\,d^{7}x^{7}+105\,cd^{6}x^{6}+315\,c^{2}d^{5}x^{5}+525\,c^{3}d^{4}x^{4}+525\,c^{4}d^{3}x^{3}+\cdots\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^6,x, algorithm="fricas")
```

```
[Out] 1/105*(8*sqrt(pi)*F^a*b^3*d*sqrt(-b*log(F)/d^2)*erf(d*sqrt(-b*log(F)/d^2)/(
d*x + c))*log(F)^3 + (15*d^7*x^7 + 105*c*d^6*x^6 + 315*c^2*d^5*x^5 + 525*c^
3*d^4*x^4 + 525*c^4*d^3*x^3 + 315*c^5*d^2*x^2 + 105*c^6*d*x + 15*c^7 + 8*(b
^3*d*x + b^3*c)*log(F)^3 + 4*(b^2*d^3*x^3 + 3*b^2*c*d^2*x^2 + 3*b^2*c^2*d*x
 + b^2*c^3)*log(F)^2 + 6*(b*d^5*x^5 + 5*b*c*d^4*x^4 + 10*b*c^2*d^3*x^3 + 10
*b*c^3*d^2*x^2 + 5*b*c^4*d*x + b*c^5)*log(F))*F^((a*d^2*x^2 + 2*a*c*d*x + a
*c^2 + b)/(d^2*x^2 + 2*c*d*x + c^2)))/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)^{6}F^{a+\frac{b}{(dx+c)^{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^6,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^6*F^(a + b/(d*x + c)^2), x)
```

maple [B] time = 0.10, size = 543, normalized size = 3.19

$$\frac{d^{6}x^{7}F^{a}F^{\frac{b}{(dx+c)^{2}}}}{7}+c\,d^{5}x^{6}F^{a}F^{\frac{b}{(dx+c)^{2}}}+\frac{2b\,d^{4}x^{5}F^{a}F^{\frac{b}{(dx+c)^{2}}}\ln(F)}{35}+3c^{2}d^{4}x^{5}F^{a}F^{\frac{b}{(dx+c)^{2}}}+\frac{2bc\,d^{3}x^{4}F^{a}F^{\frac{b}{(dx+c)^{2}}}\ln(F)}{7}+5c^{3}d^{3}x^{4}F^{a}\cdots$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)^2*b)*(d*x+c)^6,x)
```

```
[Out] 1/7*F^a*d^6*F^(1/(d*x+c)^2*b)*x^7+F^a*d^5*F^(1/(d*x+c)^2*b)*c*x^6+3*F^a*d^4
*F^(1/(d*x+c)^2*b)*c^2*x^5+5*F^a*d^3*F^(1/(d*x+c)^2*b)*c^3*x^4+5*F^a*d^2*F^
(1/(d*x+c)^2*b)*c^4*x^3+3*F^a*d*F^(1/(d*x+c)^2*b)*c^5*x^2+F^a*F^(1/(d*x+c)^
```

```
2*b)*c^6*x+1/7*F^a/d*F^(1/(d*x+c)^2*b)*c^7+2/35*F^a*d^4*b*ln(F)*F^(1/(d*x+c
)^2*b)*x^5+2/7*F^a*d^3*b*ln(F)*F^(1/(d*x+c)^2*b)*c*x^4+4/7*F^a*d^2*b*ln(F)*
F^(1/(d*x+c)^2*b)*c^2*x^3+4/7*F^a*d*b*ln(F)*F^(1/(d*x+c)^2*b)*c^3*x^2+2/7*F
^a*b*ln(F)*F^(1/(d*x+c)^2*b)*c^4*x+2/35*F^a/d*b*ln(F)*F^(1/(d*x+c)^2*b)*c^5
+4/105*F^a*d^2*b^2*ln(F)^2*F^(1/(d*x+c)^2*b)*x^3+4/35*F^a*d*b^2*ln(F)^2*F^(
1/(d*x+c)^2*b)*c*x^2+4/35*F^a*b^2*ln(F)^2*F^(1/(d*x+c)^2*b)*c^2*x+4/105*F^a
/d*b^2*ln(F)^2*F^(1/(d*x+c)^2*b)*c^3+8/105*F^a*b^3*ln(F)^3*F^(1/(d*x+c)^2*b
)*x+8/105*F^a/d*b^3*ln(F)^3*F^(1/(d*x+c)^2*b)*c-8/105*F^a/d*b^4*ln(F)^4*Pi^
(1/2)/(-b*ln(F))^(1/2)*erf((-b*ln(F))^(1/2)/(d*x+c))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{105}\left(15\,F^{a}d^{6}x^{7}+105\,F^{a}cd^{5}x^{6}+3\left(105\,F^{a}c^{2}d^{4}+2\,F^{a}bd^{4}\log(F)\right)x^{5}+15\left(35\,F^{a}c^{3}d^{3}+2\,F^{a}bcd^{3}\log(F)\right)x^{4}+\left(525\,F\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^6,x, algorithm="maxima")
```

```
[Out] 1/105*(15*F^a*d^6*x^7 + 105*F^a*c*d^5*x^6 + 3*(105*F^a*c^2*d^4 + 2*F^a*b*d^
4*log(F))*x^5 + 15*(35*F^a*c^3*d^3 + 2*F^a*b*c*d^3*log(F))*x^4 + (525*F^a*c
^4*d^2 + 60*F^a*b*c^2*d^2*log(F) + 4*F^a*b^2*d^2*log(F)^2)*x^3 + 3*(105*F^a
*c^5*d + 20*F^a*b*c^3*d*log(F) + 4*F^a*b^2*c*d*log(F)^2)*x^2 + (105*F^a*c^6
 + 30*F^a*b*c^4*log(F) + 12*F^a*b^2*c^2*log(F)^2 + 8*F^a*b^3*log(F)^3)*x)*F
^(b/(d^2*x^2 + 2*c*d*x + c^2)) + integrate(2/105*(8*F^a*b^4*d*x*log(F)^4 -
15*F^a*b*c^7*log(F) - 6*F^a*b^2*c^5*log(F)^2 - 4*F^a*b^3*c^3*log(F)^3)*F^(b
/(d^2*x^2 + 2*c*d*x + c^2))/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3), x)
```

mupad [B] time = 4.41, size = 199, normalized size = 1.17

$$\frac{F^{a}\,F^{\frac{b}{(c+d\,x)^{2}}}\,(c+d\,x)^{7}}{7\,d}-\frac{8\,F^{a}\,\sqrt{\pi}\,(c+d\,x)^{7}\left(-\frac{b\,\ln(F)}{(c+d\,x)^{2}}\right)^{7/2}}{105\,d}+\frac{4\,F^{a}\,F^{\frac{b}{(c+d\,x)^{2}}}\,b^{2}\ln(F)^{2}\,(c+d\,x)^{3}}{105\,d}+\frac{2\,F^{a}\,F^{\frac{b}{(c+d\,x)^{2}}}\,b\,\ln(F)\,(c+}{35\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)*(c + d*x)^6,x)
```

```
[Out] (F^a*F^(b/(c + d*x)^2)*(c + d*x)^7)/(7*d) - (8*F^a*pi^(1/2)*(c + d*x)^7*(-(
b*log(F))/(c + d*x)^2)^(7/2))/(105*d) + (4*F^a*F^(b/(c + d*x)^2)*b^2*log(F)
^2*(c + d*x)^3)/(105*d) + (2*F^a*F^(b/(c + d*x)^2)*b*log(F)*(c + d*x)^5)/(3
5*d) + (8*F^a*F^(b/(c + d*x)^2)*b^3*log(F)^3*(c + d*x))/(105*d) + (8*F^a*pi
^(1/2)*erfc((-(b*log(F))/(c + d*x)^2)^(1/2))*(c + d*x)^7*(-(b*log(F))/(c +
d*x)^2)^(7/2))/(105*d)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)*(d*x+c)**6,x)
```

```
[Out] Timed out
```

3.330 $\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)^4\,dx$

Optimal. Leaf size=136

$$-\frac{4\sqrt{\pi}\,b^{5/2}F^a\log^{\frac{5}{2}}(F)\operatorname{erfi}\left(\frac{\sqrt{b}\sqrt{\log(F)}}{c+dx}\right)}{15d}+\frac{4b^2\log^2(F)(c+dx)F^{a+\frac{b}{(c+dx)^2}}}{15d}+\frac{(c+dx)^5F^{a+\frac{b}{(c+dx)^2}}}{5d}+\frac{2b\log(F)(c+dx)^3F^{a+\frac{b}{(c+dx)^2}}}{15d}$$

```
[Out] 1/5*F^(a+b/(d*x+c)^2)*(d*x+c)^5/d+2/15*b*F^(a+b/(d*x+c)^2)*(d*x+c)^3*ln(F)/
d+4/15*b^2*F^(a+b/(d*x+c)^2)*(d*x+c)*ln(F)^2/d-4/15*b^(5/2)*F^a*erfi(b^(1/2
)*ln(F)^(1/2)/(d*x+c))*ln(F)^(5/2)*Pi^(1/2)/d
```

Rubi [A] time = 0.17, antiderivative size = 136, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {2214, 2206, 2211, 2204}

$$-\frac{4\sqrt{\pi}\,b^{5/2}F^a\log^{\frac{5}{2}}(F)\operatorname{Erfi}\left(\frac{\sqrt{b}\sqrt{\log(F)}}{c+dx}\right)}{15d}+\frac{4b^2\log^2(F)(c+dx)F^{a+\frac{b}{(c+dx)^2}}}{15d}+\frac{(c+dx)^5F^{a+\frac{b}{(c+dx)^2}}}{5d}+\frac{2b\log(F)(c+dx)^3F^{a+\frac{b}{(c+dx)^2}}}{15d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2)*(c + d*x)^4,x]
```

```
[Out] (F^(a + b/(c + d*x)^2)*(c + d*x)^5)/(5*d) + (2*b*F^(a + b/(c + d*x)^2)*(c +
 d*x)^3*Log[F])/(15*d) + (4*b^2*F^(a + b/(c + d*x)^2)*(c + d*x)*Log[F]^2)/(
15*d) - (4*b^(5/2)*F^a*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[F]])/(c + d*x)]*Log[
F]^(5/2))/(15*d)
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2206

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[((c +
 d*x)*F^(a + b*(c + d*x)^n))/d, x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2211

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
```

```
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\begin{aligned}\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)^4\,dx &= \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^5}{5d}+\frac{1}{5}(2b\log(F))\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)^2\,dx\\ &= \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^5}{5d}+\frac{2bF^{a+\frac{b}{(c+dx)^2}}(c+dx)^3\log(F)}{15d}+\frac{1}{15}\left(4b^2\log^2(F)\right)\int F^{a+\frac{b}{(c+dx)^2}}\,dx\\ &= \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^5}{5d}+\frac{2bF^{a+\frac{b}{(c+dx)^2}}(c+dx)^3\log(F)}{15d}+\frac{4b^2F^{a+\frac{b}{(c+dx)^2}}(c+dx)\log^2(F)}{15d}+\\ &= \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^5}{5d}+\frac{2bF^{a+\frac{b}{(c+dx)^2}}(c+dx)^3\log(F)}{15d}+\frac{4b^2F^{a+\frac{b}{(c+dx)^2}}(c+dx)\log^2(F)}{15d}-\\ &= \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^5}{5d}+\frac{2bF^{a+\frac{b}{(c+dx)^2}}(c+dx)^3\log(F)}{15d}+\frac{4b^2F^{a+\frac{b}{(c+dx)^2}}(c+dx)\log^2(F)}{15d}-\end{aligned}$$

Mathematica [A] time = 0.10, size = 97, normalized size = 0.71

$$\frac{F^a\left((c+dx)F^{\frac{b}{(c+dx)^2}}\left(4b^2\log^2(F)+2b\log(F)(c+dx)^2+3(c+dx)^4\right)-4\sqrt{\pi}\,b^{5/2}\log^{\frac{5}{2}}(F)\operatorname{erfi}\left(\frac{\sqrt{b}\sqrt{\log(F)}}{c+dx}\right)\right)}{15d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^2)*(c + d*x)^4,x]
```

```
[Out] (F^a*(-4*b^(5/2)*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[F]])/(c + d*x)]*Log[F]^(5/
2) + F^(b/(c + d*x)^2)*(c + d*x)*(3*(c + d*x)^4 + 2*b*(c + d*x)^2*Log[F] +
4*b^2*Log[F]^2)))/(15*d)
```

fricas [A] time = 0.41, size = 201, normalized size = 1.48

$$\frac{4\sqrt{\pi}F^{a}b^{2}d\sqrt{-\frac{b\log(F)}{d^{2}}}\operatorname{erf}\left(\frac{d\sqrt{-\frac{b\log(F)}{d^{2}}}}{dx+c}\right)\log(F)^{2}+\left(3\,d^{5}x^{5}+15\,cd^{4}x^{4}+30\,c^{2}d^{3}x^{3}+30\,c^{3}d^{2}x^{2}+15\,c^{4}dx+3\,c^{5}+4\right.}{15\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^4,x, algorithm="fricas")
```

```
[Out] 1/15*(4*sqrt(pi)*F^a*b^2*d*sqrt(-b*log(F)/d^2)*erf(d*sqrt(-b*log(F)/d^2)/(d
*x + c))*log(F)^2 + (3*d^5*x^5 + 15*c*d^4*x^4 + 30*c^2*d^3*x^3 + 30*c^3*d^2
*x^2 + 15*c^4*d*x + 3*c^5 + 4*(b^2*d*x + b^2*c)*log(F)^2 + 2*(b*d^3*x^3 + 3
*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3)*log(F))*F^((a*d^2*x^2 + 2*a*c*d*x + a*c
^2 + b)/(d^2*x^2 + 2*c*d*x + c^2)))/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)^{4}F^{a+\frac{b}{(dx+c)^{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^4,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^4*F^(a + b/(d*x + c)^2), x)
```

maple [B] time = 0.08, size = 324, normalized size = 2.38

$$\frac{d^{4}x^{5}F^{a}F^{\frac{b}{(dx+c)^{2}}}}{5}+c\,d^{3}x^{4}F^{a}F^{\frac{b}{(dx+c)^{2}}}+\frac{2b\,d^{2}x^{3}F^{a}F^{\frac{b}{(dx+c)^{2}}}\ln(F)}{15}+2c^{2}d^{2}x^{3}F^{a}F^{\frac{b}{(dx+c)^{2}}}+\frac{2bcd\,x^{2}F^{a}F^{\frac{b}{(dx+c)^{2}}}\ln(F)}{5}+2c^{3}d\,x^{2}F^{a}F^{(}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)^2*b)*(d*x+c)^4,x)
```

```
[Out] 1/5*F^a*d^4*F^(1/(d*x+c)^2*b)*x^5+F^a*d^3*F^(1/(d*x+c)^2*b)*c*x^4+2*F^a*d^2
*F^(1/(d*x+c)^2*b)*c^2*x^3+2*F^a*d*F^(1/(d*x+c)^2*b)*c^3*x^2+F^a*F^(1/(d*x+
c)^2*b)*c^4*x+1/5*F^a/d*F^(1/(d*x+c)^2*b)*c^5+2/15*F^a*d^2*b*ln(F)*F^(1/(d*
x+c)^2*b)*x^3+2/5*F^a*d*b*ln(F)*F^(1/(d*x+c)^2*b)*c*x^2+2/5*F^a*b*ln(F)*F^(
1/(d*x+c)^2*b)*c^2*x+2/15*F^a/d*b*ln(F)*F^(1/(d*x+c)^2*b)*c^3+4/15*F^a*b^2*
ln(F)^2*F^(1/(d*x+c)^2*b)*x+4/15*F^a/d*b^2*ln(F)^2*F^(1/(d*x+c)^2*b)*c-4/15
*F^a/d*b^3*ln(F)^3*Pi^(1/2)/(-b*ln(F))^(1/2)*erf((-b*ln(F))^(1/2)/(d*x+c))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{15}\left(3\,F^{a}d^{4}x^{5}+15\,F^{a}cd^{3}x^{4}+2\left(15\,F^{a}c^{2}d^{2}+F^{a}bd^{2}\log(F)\right)x^{3}+6\left(5\,F^{a}c^{3}d+F^{a}bcd\log(F)\right)x^{2}+\left(15\,F^{a}c^{4}+6\,F^{a}bc\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^4,x, algorithm="maxima")
```

```
[Out] 1/15*(3*F^a*d^4*x^5 + 15*F^a*c*d^3*x^4 + 2*(15*F^a*c^2*d^2 + F^a*b*d^2*log(
F))*x^3 + 6*(5*F^a*c^3*d + F^a*b*c*d*log(F))*x^2 + (15*F^a*c^4 + 6*F^a*b*c^
2*log(F) + 4*F^a*b^2*log(F)^2)*x)*F^(b/(d^2*x^2 + 2*c*d*x + c^2)) + integra
te(2/15*(4*F^a*b^3*d*x*log(F)^3 - 3*F^a*b*c^5*log(F) - 2*F^a*b^2*c^3*log(F)
^2)*F^(b/(d^2*x^2 + 2*c*d*x + c^2))/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^
3), x)
```

mupad [B] time = 4.01, size = 166, normalized size = 1.22

$$\frac{F^{a}\,F^{\frac{b}{(c+d\,x)^{2}}}\,(c+d\,x)^{5}}{5\,d}+\frac{4\,F^{a}\,\sqrt{\pi}\,(c+d\,x)^{5}\left(-\frac{b\,\ln(F)}{(c+d\,x)^{2}}\right)^{5/2}}{15\,d}+\frac{2\,F^{a}\,F^{\frac{b}{(c+d\,x)^{2}}}\,b\,\ln(F)\,(c+d\,x)^{3}}{15\,d}+\frac{4\,F^{a}\,F^{\frac{b}{(c+d\,x)^{2}}}\,b^{2}\ln(F)^{2}\,(c\cdots}{15\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)*(c + d*x)^4,x)
```

```
[Out] (F^a*F^(b/(c + d*x)^2)*(c + d*x)^5)/(5*d) + (4*F^a*pi^(1/2)*(c + d*x)^5*(-(
b*log(F))/(c + d*x)^2)^(5/2))/(15*d) + (2*F^a*F^(b/(c + d*x)^2)*b*log(F)*(c
 + d*x)^3)/(15*d) + (4*F^a*F^(b/(c + d*x)^2)*b^2*log(F)^2*(c + d*x))/(15*d)
 - (4*F^a*pi^(1/2)*erfc((-(b*log(F))/(c + d*x)^2)^(1/2))*(c + d*x)^5*(-(b*l
og(F))/(c + d*x)^2)^(5/2))/(15*d)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{(c+dx)^{2}}}\,(c+dx)^{4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)*(d*x+c)**4,x)
```

```
[Out] Integral(F**(a + b/(c + d*x)**2)*(c + d*x)**4, x)
```

3.331 $\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)^2\,dx$

Optimal. Leaf size=102

$$-\frac{2\sqrt{\pi}\,b^{3/2}F^a\log^{\frac{3}{2}}(F)\mathrm{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(F)}}{c+dx}\right)}{3d}+\frac{(c+dx)^3F^{a+\frac{b}{(c+dx)^2}}}{3d}+\frac{2b\log(F)(c+dx)F^{a+\frac{b}{(c+dx)^2}}}{3d}$$

```
[Out] 1/3*F^(a+b/(d*x+c)^2)*(d*x+c)^3/d+2/3*b*F^(a+b/(d*x+c)^2)*(d*x+c)*ln(F)/d-2
/3*b^(3/2)*F^a*erfi(b^(1/2)*ln(F)^(1/2)/(d*x+c))*ln(F)^(3/2)*Pi^(1/2)/d
```

Rubi [A] time = 0.12, antiderivative size = 102, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {2214, 2206, 2211, 2204}

$$-\frac{2\sqrt{\pi}\,b^{3/2}F^a\log^{\frac{3}{2}}(F)\mathrm{Erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(F)}}{c+dx}\right)}{3d}+\frac{(c+dx)^3F^{a+\frac{b}{(c+dx)^2}}}{3d}+\frac{2b\log(F)(c+dx)F^{a+\frac{b}{(c+dx)^2}}}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2)*(c + d*x)^2,x]
```

```
[Out] (F^(a + b/(c + d*x)^2)*(c + d*x)^3)/(3*d) + (2*b*F^(a + b/(c + d*x)^2)*(c +
 d*x)*Log[F])/(3*d) - (2*b^(3/2)*F^a*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[F]])/(
c + d*x)]*Log[F]^(3/2))/(3*d)
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2206

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[((c +
 d*x)*F^(a + b*(c + d*x)^n))/d, x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2211

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
```

```
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\begin{aligned}\int F^{a+\frac{b}{(c+dx)^2}}(c+dx)^2\,dx &= \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^3}{3d}+\frac{1}{3}(2b\log(F))\int F^{a+\frac{b}{(c+dx)^2}}\,dx\\ &= \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^3}{3d}+\frac{2bF^{a+\frac{b}{(c+dx)^2}}(c+dx)\log(F)}{3d}+\frac{1}{3}\left(4b^2\log^2(F)\right)\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^2}\,dx\\ &= \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^3}{3d}+\frac{2bF^{a+\frac{b}{(c+dx)^2}}(c+dx)\log(F)}{3d}-\frac{\left(4b^2\log^2(F)\right)\mathrm{Subst}\left(\int F^{a+bx^2}\,dx,\right.}{3d}\\ &= \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)^3}{3d}+\frac{2bF^{a+\frac{b}{(c+dx)^2}}(c+dx)\log(F)}{3d}-\frac{2b^{3/2}F^a\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{b}\sqrt{\log(F)}}{c+dx}\right)\log^{\frac{3}{2}}(}{3d}\end{aligned}$$

Mathematica [A] time = 0.08, size = 79, normalized size = 0.77

$$\frac{F^a\left((c+dx)F^{\frac{b}{(c+dx)^2}}\left(2b\log(F)+(c+dx)^2\right)-2\sqrt{\pi}\,b^{3/2}\log^{\frac{3}{2}}(F)\mathrm{erfi}\left(\frac{\sqrt{b}\sqrt{\log(F)}}{c+dx}\right)\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^2)*(c + d*x)^2,x]
```

```
[Out] (F^a*(-2*b^(3/2)*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[F]])/(c + d*x)]*Log[F]^(3/
2) + F^(b/(c + d*x)^2)*(c + d*x)*((c + d*x)^2 + 2*b*Log[F])))/(3*d)
```

fricas [A] time = 0.42, size = 130, normalized size = 1.27

$$\frac{2\sqrt{\pi}\,F^abd\sqrt{-\frac{b\log(F)}{d^2}}\;\mathrm{erf}\left(\frac{d\sqrt{-\frac{b\log(F)}{d^2}}}{dx+c}\right)\log(F)+\left(d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3+2\,(bdx+bc)\log(F)\right)F^{\frac{ad^2x^2+2\,acdx+ac}{d^2x^2+2\,cdx+c}}}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^2,x, algorithm="fricas")
```

```
[Out] 1/3*(2*sqrt(pi)*F^a*b*d*sqrt(-b*log(F)/d^2)*erf(d*sqrt(-b*log(F)/d^2)/(d*x
+ c))*log(F) + (d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3 + 2*(b*d*x + b*c)*l
og(F))*F^((a*d^2*x^2 + 2*a*c*d*x + a*c^2 + b)/(d^2*x^2 + 2*c*d*x + c^2)))/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)^2 F^{a+\frac{b}{(dx+c)^2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^2,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^2*F^(a + b/(d*x + c)^2), x)
```

maple [A] time = 0.07, size = 169, normalized size = 1.66

$$\frac{d^2x^3F^aF^{\frac{b}{(dx+c)^2}}}{3}+cd\,x^2F^aF^{\frac{b}{(dx+c)^2}}-\frac{2\sqrt{\pi}\,b^2F^a\,\mathrm{erf}\left(\frac{\sqrt{-b\ln(F)}}{dx+c}\right)\ln(F)^2}{3\sqrt{-b\ln(F)}\,d}+\frac{2bx\,F^aF^{\frac{b}{(dx+c)^2}}\ln(F)}{3}+c^2x\,F^aF^{\frac{b}{(dx+c)^2}}+\frac{2bc\,F^aF^{\frac{b}{(dx+c}}}{3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)^2*b)*(d*x+c)^2,x)
```

```
[Out] 1/3*F^a*d^2*F^(1/(d*x+c)^2*b)*x^3+F^a*d*F^(1/(d*x+c)^2*b)*c*x^2+F^a*F^(1/(d
*x+c)^2*b)*c^2*x+1/3*F^a/d*F^(1/(d*x+c)^2*b)*c^3+2/3*F^a*b*ln(F)*F^(1/(d*x+
c)^2*b)*x+2/3*F^a/d*b*ln(F)*F^(1/(d*x+c)^2*b)*c-2/3*F^a/d*b^2*ln(F)^2*Pi^(1
/2)/(-b*ln(F))^(1/2)*erf((-b*ln(F))^(1/2)/(d*x+c))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{3}\left(F^ad^2x^3+3\,F^acdx^2+\left(3\,F^ac^2+2\,F^ab\log(F)\right)x\right)F^{\frac{b}{d^2x^2+2\,cdx+c^2}}+\int\frac{2\left(2\,F^ab^2dx\log(F)^2-F^abc^3\log(F)\right)F^{\frac{b}{d^2x^2+2\,cdx+c^2}}}{3\left(d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)*(d*x+c)^2,x, algorithm="maxima")
```

```
[Out] 1/3*(F^a*d^2*x^3 + 3*F^a*c*d*x^2 + (3*F^a*c^2 + 2*F^a*b*log(F))*x)*F^(b/(d^
2*x^2 + 2*c*d*x + c^2)) + integrate(2/3*(2*F^a*b^2*d*x*log(F)^2 - F^a*b*c^3
*log(F))*F^(b/(d^2*x^2 + 2*c*d*x + c^2))/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x
 + c^3), x)
```

mupad [B] time = 4.00, size = 97, normalized size = 0.95

$$\frac{\left(\frac{F^a\,F^{\frac{b}{{\left(c+d\,x\right)}^2}}}{3}+\frac{2\,F^a\,F^{\frac{b}{{\left(c+d\,x\right)}^2}}\,b\,\ln\left(F\right)}{3\,{\left(c+d\,x\right)}^2}\right)\,{\left(c+d\,x\right)}^3}{d}-\frac{2\,F^a\,b^2\,\sqrt{\pi }\,\mathrm{erfi}\left(\frac{b\,\ln\left(F\right)}{\sqrt{b\,\ln\left(F\right)}\,\left(c+d\,x\right)}\right)\,{\ln\left(F\right)}^2}{3\,d\,\sqrt{b\,\ln\left(F\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)*(c + d*x)^2,x)
```

```
[Out] (((F^a*F^(b/(c + d*x)^2))/3 + (2*F^a*F^(b/(c + d*x)^2)*b*log(F))/(3*(c + d*
x)^2))*(c + d*x)^3)/d - (2*F^a*b^2*pi^(1/2)*erfi((b*log(F))/((b*log(F))^(1/
2)*(c + d*x)))*log(F)^2)/(3*d*(b*log(F))^(1/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a + \frac{b}{(c+dx)^2}} (c + dx)^2 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)*(d*x+c)**2,x)
```

```
[Out] Integral(F**(a + b/(c + d*x)**2)*(c + d*x)**2, x)
```

3.332 $\int F^{a+\frac{b}{(c+dx)^2}}\,dx$

Optimal. Leaf size=67

$$\frac{(c+dx)F^{a+\frac{b}{(c+dx)^2}}}{d}-\frac{\sqrt{\pi}\,\sqrt{b}\,F^a\sqrt{\log(F)}\,\mathrm{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(F)}}{c+dx}\right)}{d}$$

```
[Out] F^(a+b/(d*x+c)^2)*(d*x+c)/d-F^a*erfi(b^(1/2)*ln(F)^(1/2)/(d*x+c))*b^(1/2)*P
i^(1/2)*ln(F)^(1/2)/d
```

Rubi [A] time = 0.06, antiderivative size = 67, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231, Rules used = {2206, 2211, 2204}

$$\frac{(c+dx)F^{a+\frac{b}{(c+dx)^2}}}{d}-\frac{\sqrt{\pi}\,\sqrt{b}\,F^a\sqrt{\log(F)}\,\mathrm{Erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(F)}}{c+dx}\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2),x]
```

```
[Out] (F^(a + b/(c + d*x)^2)*(c + d*x))/d - (Sqrt[b]*F^a*Sqrt[Pi]*Erfi[(Sqrt[b]*S
qrt[Log[F]])/(c + d*x)]*Sqrt[Log[F]])/d
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2206

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[((c +
 d*x)*F^(a + b*(c + d*x)^n))/d, x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2211

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rubi steps

$$\begin{aligned}\int F^{a+\frac{b}{(c+dx)^2}}\,dx &= \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)}{d} + (2b\log(F))\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^2}\,dx \\ &= \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)}{d} - \frac{(2b\log(F))\,\mathrm{Subst}\left(\int F^{a+bx^2}\,dx, x, \frac{1}{c+dx}\right)}{d} \\ &= \frac{F^{a+\frac{b}{(c+dx)^2}}(c+dx)}{d} - \frac{\sqrt{b}\,F^a\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(F)}}{c+dx}\right)\sqrt{\log(F)}}{d}\end{aligned}$$

Mathematica [A] time = 0.04, size = 63, normalized size = 0.94

$$\frac{F^a\left((c+dx)F^{\frac{b}{(c+dx)^2}} - \sqrt{\pi}\,\sqrt{b}\,\sqrt{\log(F)}\,\mathrm{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(F)}}{c+dx}\right)\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^2),x]
```

```
[Out] (F^a*(F^(b/(c + d*x)^2)*(c + d*x) - Sqrt[b]*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log
[F]])/(c + d*x)]*Sqrt[Log[F]]))/d
```

fricas [A] time = 0.41, size = 91, normalized size = 1.36

$$\frac{\sqrt{\pi}\,F^a d\sqrt{-\frac{b\log(F)}{d^2}}\ \mathrm{erf}\left(\frac{d\sqrt{-\frac{b\log(F)}{d^2}}}{dx+c}\right) + (dx+c)F^{\frac{ad^2x^2+2\,acdx+ac^2+b}{d^2x^2+2\,cdx+c^2}}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2),x, algorithm="fricas")
```

```
[Out] (sqrt(pi)*F^a*d*sqrt(-b*log(F)/d^2)*erf(d*sqrt(-b*log(F)/d^2)/(d*x + c)) +
(d*x + c)*F^((a*d^2*x^2 + 2*a*c*d*x + a*c^2 + b)/(d^2*x^2 + 2*c*d*x + c^2))
)/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{(dx+c)^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2),x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c)^2), x)
```

maple [A] time = 0.06, size = 74, normalized size = 1.10

$$-\frac{\sqrt{\pi}\, b\, F^{a} \operatorname{erf}\left(\frac{\sqrt{-b\ln(F)}}{dx+c}\right)\ln(F)}{\sqrt{-b\ln(F)}\, d}+x\, F^{a} F^{\frac{b}{(dx+c)^{2}}}+\frac{c\, F^{a} F^{\frac{b}{(dx+c)^{2}}}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)^2*b),x)
```

```
[Out] F^a*F^(1/(d*x+c)^2*b)*x+1/d*F^a*F^(1/(d*x+c)^2*b)*c-1/d*F^a*b*ln(F)*Pi^(1/2
)/(-b*ln(F))^(1/2)*erf((-b*ln(F))^(1/2)/(d*x+c))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$2\, F^{a} b d \int \frac{F^{\frac{b}{d^{2}x^{2}+2\, cdx+c^{2}}} x}{d^{3}x^{3}+3\, cd^{2}x^{2}+3\, c^{2}dx+c^{3}}\, dx \log(F)+F^{a} F^{\frac{b}{d^{2}x^{2}+2\, cdx+c^{2}}} x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2),x, algorithm="maxima")
```

```
[Out] 2*F^a*b*d*integrate(F^(b/(d^2*x^2 + 2*c*d*x + c^2))*x/(d^3*x^3 + 3*c*d^2*x^
2 + 3*c^2*d*x + c^3), x)*log(F) + F^a*F^(b/(d^2*x^2 + 2*c*d*x + c^2))*x
```

mupad [B] time = 4.77, size = 62, normalized size = 0.93

$$\frac{F^{a}\, F^{\frac{b}{(c+d\,x)^{2}}}\, (c+d\,x)}{d}-\frac{F^{a}\, b\,\sqrt{\pi}\, \operatorname{erfi}\left(\frac{b\,\ln(F)}{\sqrt{b\,\ln(F)}\,(c+d\,x)}\right)\ln(F)}{d\,\sqrt{b\,\ln(F)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2),x)
```

```
[Out] (F^a*F^(b/(c + d*x)^2)*(c + d*x))/d - (F^a*b*pi^(1/2)*erfi((b*log(F))/((b*l
og(F))^(1/2)*(c + d*x)))*log(F))/(d*(b*log(F))^(1/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{(c+dx)^{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2),x)
```

```
[Out] Integral(F**(a + b/(c + d*x)**2), x)
```

3.333 $\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^2}\,dx$

Optimal. Leaf size=46

$$-\frac{\sqrt{\pi}\,F^a \text{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(F)}}{c+dx}\right)}{2\sqrt{b}\,d\sqrt{\log(F)}}$$

```
[Out] -1/2*F^a*erfi(b^(1/2)*ln(F)^(1/2)/(d*x+c))*Pi^(1/2)/d/b^(1/2)/ln(F)^(1/2)
```

Rubi [A] time = 0.05, antiderivative size = 46, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2211, 2204}

$$-\frac{\sqrt{\pi}\,F^a \text{Erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(F)}}{c+dx}\right)}{2\sqrt{b}\,d\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2)/(c + d*x)^2,x]
```

```
[Out] -(F^a*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[F]])/(c + d*x)])/(2*Sqrt[b]*d*Sqrt[Lo
g[F]])
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2211

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^2}\,dx = -\frac{\text{Subst}\left(\int F^{a+bx^2}\,dx, x, \frac{1}{c+dx}\right)}{d}$$
$$= -\frac{F^a\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{b}\sqrt{\log(F)}}{c+dx}\right)}{2\sqrt{b}\,d\sqrt{\log(F)}}$$

Mathematica [A] time = 0.01, size = 46, normalized size = 1.00

$$-\frac{\sqrt{\pi}\,F^a\text{erfi}\left(\frac{\sqrt{b}\sqrt{\log(F)}}{c+dx}\right)}{2\sqrt{b}\,d\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^2)/(c + d*x)^2,x]
```

```
[Out] -1/2*(F^a*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[F]])/(c + d*x)])/(Sqrt[b]*d*Sqrt[
Log[F]])
```

fricas [A] time = 0.41, size = 45, normalized size = 0.98

$$\frac{\sqrt{\pi}\,F^a\sqrt{-\frac{b\log(F)}{d^2}}\,\text{erf}\left(\frac{d\sqrt{-\frac{b\log(F)}{d^2}}}{dx+c}\right)}{2\,b\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^2,x, algorithm="fricas")
```

```
[Out] 1/2*sqrt(pi)*F^a*sqrt(-b*log(F)/d^2)*erf(d*sqrt(-b*log(F)/d^2)/(d*x + c))/(
b*log(F))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{(dx+c)^2}}}{(dx+c)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^2,x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c)^2)/(d*x + c)^2, x)
```

maple [A] time = 0.06, size = 35, normalized size = 0.76

$$-\frac{\sqrt{\pi}\, F^{a} \operatorname{erf}\left(\frac{\sqrt{-b \ln(F)}}{dx+c}\right)}{2\sqrt{-b \ln(F)}\, d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)^2*b)/(d*x+c)^2,x)
```

```
[Out] -1/2/d*F^a*Pi^(1/2)/(-b*ln(F))^(1/2)*erf((-b*ln(F))^(1/2)/(d*x+c))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{(dx+c)^2}}}{(dx+c)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^2,x, algorithm="maxima")
```

```
[Out] integrate(F^(a + b/(d*x + c)^2)/(d*x + c)^2, x)
```

mupad [B] time = 3.50, size = 35, normalized size = 0.76

$$-\frac{F^{a} \sqrt{\pi} \operatorname{erfi}\left(\frac{b \ln(F)}{\sqrt{b \ln(F)}\, (c+d\,x)}\right)}{2\,d\,\sqrt{b \ln(F)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)/(c + d*x)^2,x)
```

```
[Out] -(F^a*pi^(1/2)*erfi((b*log(F))/((b*log(F))^(1/2)*(c + d*x))))/(2*d*(b*log(F
))^(1/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)/(d*x+c)**2,x)
```

```
[Out] Integral(F**(a + b/(c + d*x)**2)/(c + d*x)**2, x)
```

3.334 $\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^4}\,dx$

Optimal. Leaf size=81

$$\frac{\sqrt{\pi}F^a\operatorname{erfi}\left(\frac{\sqrt{b}\sqrt{\log(F)}}{c+dx}\right)}{4b^{3/2}d\log^{\frac{3}{2}}(F)}-\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd\log(F)(c+dx)}$$

```
[Out] -1/2*F^(a+b/(d*x+c)^2)/b/d/(d*x+c)/ln(F)+1/4*F^a*erfi(b^(1/2)*ln(F)^(1/2)/(
d*x+c))*Pi^(1/2)/b^(3/2)/d/ln(F)^(3/2)
```

Rubi [A] time = 0.10, antiderivative size = 81, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2212, 2211, 2204}

$$\frac{\sqrt{\pi}F^a\text{Erfi}\left(\frac{\sqrt{b}\sqrt{\log(F)}}{c+dx}\right)}{4b^{3/2}d\log^{\frac{3}{2}}(F)}-\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd\log(F)(c+dx)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2)/(c + d*x)^4,x]
```

```
[Out] (F^a*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[F]])/(c + d*x)])/(4*b^(3/2)*d*Log[F]^(
3/2)) - F^(a + b/(c + d*x)^2)/(2*b*d*(c + d*x)*Log[F])
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2211

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
```

```
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\begin{aligned}\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^4}\,dx &= -\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)\log(F)}-\frac{\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^2}\,dx}{2b\log(F)}\\ &= -\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)\log(F)}+\frac{\text{Subst}\left(\int F^{a+bx^2}\,dx,x,\frac{1}{c+dx}\right)}{2bd\log(F)}\\ &= \frac{F^a\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{b}\sqrt{\log(F)}}{c+dx}\right)}{4b^{3/2}d\log^{\frac{3}{2}}(F)}-\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)\log(F)}\end{aligned}$$

Mathematica [A] time = 0.05, size = 81, normalized size = 1.00

$$\frac{\sqrt{\pi}\,F^a\text{erfi}\left(\frac{\sqrt{b}\sqrt{\log(F)}}{c+dx}\right)}{4b^{3/2}d\log^{\frac{3}{2}}(F)}-\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd\log(F)(c+dx)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^2)/(c + d*x)^4,x]
```

```
[Out] (F^a*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[F]])/(c + d*x)])/(4*b^(3/2)*d*Log[F]^(
3/2)) - F^(a + b/(c + d*x)^2)/(2*b*d*(c + d*x)*Log[F])
```

fricas [A] time = 0.43, size = 117, normalized size = 1.44

$$-\frac{\sqrt{\pi}\left(d^2x+cd\right)F^a\sqrt{-\frac{b\log(F)}{d^2}}\ \text{erf}\left(\frac{d\sqrt{-\frac{b\log(F)}{d^2}}}{dx+c}\right)+2\,F^{\frac{ad^2x^2+2\,acdx+ac^2+b}{d^2x^2+2\,cdx+c^2}}b\log(F)}{4\left(b^2d^2x+b^2cd\right)\log(F)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^4,x, algorithm="fricas")
```

```
[Out] -1/4*(sqrt(pi)*(d^2*x + c*d)*F^a*sqrt(-b*log(F)/d^2)*erf(d*sqrt(-b*log(F)/d
^2)/(d*x + c)) + 2*F^((a*d^2*x^2 + 2*a*c*d*x + a*c^2 + b)/(d^2*x^2 + 2*c*d*
x + c^2))*b*log(F))/((b^2*d^2*x + b^2*c*d)*log(F)^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{(dx+c)^2}}}{(dx+c)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^4,x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c)^2)/(d*x + c)^4, x)
```

maple [A] time = 0.08, size = 76, normalized size = 0.94

$$-\frac{F^{a} F^{\frac{b}{(dx+c)^2}}}{2\,(dx+c)\,bd\ln(F)}+\frac{\sqrt{\pi}\,F^{a}\,\mathrm{erf}\left(\frac{\sqrt{-b\ln(F)}}{dx+c}\right)}{4\sqrt{-b\ln(F)}\,bd\ln(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)^2*b)/(d*x+c)^4,x)
```

```
[Out] -1/2/d*F^a*F^(1/(d*x+c)^2*b)/(d*x+c)/b/ln(F)+1/4/d*F^a/b/ln(F)*Pi^(1/2)/(-b
*ln(F))^(1/2)*erf((-b*ln(F))^(1/2)/(d*x+c))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{(dx+c)^2}}}{(dx+c)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^4,x, algorithm="maxima")
```

```
[Out] integrate(F^(a + b/(d*x + c)^2)/(d*x + c)^4, x)
```

mupad [B] time = 3.98, size = 76, normalized size = 0.94

$$\frac{F^{a}\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\,\ln(F)}{\sqrt{b\,\ln(F)}\,(c+d\,x)}\right)}{4\,b\,d\,\ln(F)\,\sqrt{b\,\ln(F)}}-\frac{F^{a}\,F^{\frac{b}{(c+d\,x)^2}}}{2\,b\,d\,\ln(F)\,(c+d\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)/(c + d*x)^4,x)
```

```
[Out] (F^a*pi^(1/2)*erfi((b*log(F))/((b*log(F))^(1/2)*(c + d*x))))/(4*b*d*log(F)*
(b*log(F))^(1/2)) - (F^a*F^(b/(c + d*x)^2))/(2*b*d*log(F)*(c + d*x))
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)/(d*x+c)**4,x)
```

```
[Out] Timed out
```

3.335 $\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^6} dx$

Optimal. Leaf size=115

$$-\frac{3\sqrt{\pi}F^a\text{erfi}\left(\frac{\sqrt{b}\sqrt{\log(F)}}{c+dx}\right)}{8b^{5/2}d\log^{\frac{5}{2}}(F)}+\frac{3F^{a+\frac{b}{(c+dx)^2}}}{4b^2d\log^2(F)(c+dx)}-\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd\log(F)(c+dx)^3}$$

```
[Out] 3/4*F^(a+b/(d*x+c)^2)/b^2/d/(d*x+c)/ln(F)^2-1/2*F^(a+b/(d*x+c)^2)/b/d/(d*x+
c)^3/ln(F)-3/8*F^a*erfi(b^(1/2)*ln(F)^(1/2)/(d*x+c))*Pi^(1/2)/b^(5/2)/d/ln(
F)^(5/2)
```

Rubi [A] time = 0.15, antiderivative size = 115, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2212, 2211, 2204}

$$-\frac{3\sqrt{\pi}F^a\text{Erfi}\left(\frac{\sqrt{b}\sqrt{\log(F)}}{c+dx}\right)}{8b^{5/2}d\log^{\frac{5}{2}}(F)}+\frac{3F^{a+\frac{b}{(c+dx)^2}}}{4b^2d\log^2(F)(c+dx)}-\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd\log(F)(c+dx)^3}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2)/(c + d*x)^6,x]
```

```
[Out] (-3*F^a*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[F]])/(c + d*x)])/(8*b^(5/2)*d*Log[F
]^(5/2)) + (3*F^(a + b/(c + d*x)^2))/(4*b^2*d*(c + d*x)*Log[F]^2) - F^(a +
b/(c + d*x)^2)/(2*b*d*(c + d*x)^3*Log[F])
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2211

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^6}\,dx = -\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)^3\log(F)} - \frac{3\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^4}\,dx}{2b\log(F)}$$

$$= \frac{3F^{a+\frac{b}{(c+dx)^2}}}{4b^2d(c+dx)\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)^3\log(F)} + \frac{3\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^2}\,dx}{4b^2\log^2(F)}$$

$$= \frac{3F^{a+\frac{b}{(c+dx)^2}}}{4b^2d(c+dx)\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)^3\log(F)} - \frac{3\,\text{Subst}\left(\int F^{a+bx^2}\,dx, x, \frac{1}{c+dx}\right)}{4b^2d\log^2(F)}$$

$$= -\frac{3F^a\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{b}\sqrt{\log(F)}}{c+dx}\right)}{8b^{5/2}d\log^{\frac{5}{2}}(F)} + \frac{3F^{a+\frac{b}{(c+dx)^2}}}{4b^2d(c+dx)\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)^3\log(F)}$$

Mathematica [A] time = 0.10, size = 95, normalized size = 0.83

$$\frac{F^a\left(-3\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{b}\sqrt{\log(F)}}{c+dx}\right) - \frac{2\sqrt{b}\sqrt{\log(F)}\,F^{\frac{b}{(c+dx)^2}}\left(2b\log(F)-3(c+dx)^2\right)}{(c+dx)^3}\right)}{8b^{5/2}d\log^{\frac{5}{2}}(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^2)/(c + d*x)^6,x]
```

```
[Out] (F^a*(-3*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[F]])/(c + d*x)] - (2*Sqrt[b]*F^(b/
(c + d*x)^2)*Sqrt[Log[F]]*(-3*(c + d*x)^2 + 2*b*Log[F]))/(c + d*x)^3))/(8*b
^(5/2)*d*Log[F]^(5/2))
```

fricas [B] time = 0.43, size = 199, normalized size = 1.73

$$\frac{3\sqrt{\pi}\left(d^4x^3+3\,cd^3x^2+3\,c^2d^2x+c^3d\right)F^a\sqrt{-\frac{b\log(F)}{d^2}}\,\operatorname{erf}\left(\frac{d\sqrt{-\frac{b\log(F)}{d^2}}}{dx+c}\right)-2\left(2\,b^2\log(F)^2-3\left(bd^2x^2+2\,bcdx+bc^2\right)\right.}{8\left(b^3d^4x^3+3\,b^3cd^3x^2+3\,b^3c^2d^2x+b^3c^3d\right)\log(F)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^6,x, algorithm="fricas")
```

```
[Out] 1/8*(3*sqrt(pi)*(d^4*x^3 + 3*c*d^3*x^2 + 3*c^2*d^2*x + c^3*d)*F^a*sqrt(-b*l
og(F)/d^2)*erf(d*sqrt(-b*log(F)/d^2)/(d*x + c)) - 2*(2*b^2*log(F)^2 - 3*(b*
d^2*x^2 + 2*b*c*d*x + b*c^2)*log(F))*F^((a*d^2*x^2 + 2*a*c*d*x + a*c^2 + b)
/(d^2*x^2 + 2*c*d*x + c^2)))/((b^3*d^4*x^3 + 3*b^3*c*d^3*x^2 + 3*b^3*c^2*d^
2*x + b^3*c^3*d)*log(F)^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{(dx+c)^2}}}{(dx+c)^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^6,x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c)^2)/(d*x + c)^6, x)
```

maple [A] time = 0.12, size = 109, normalized size = 0.95

$$-\frac{F^aF^{\frac{b}{(dx+c)^2}}}{2\,(dx+c)^3\,bd\ln(F)}+\frac{3F^aF^{\frac{b}{(dx+c)^2}}}{4\,(dx+c)\,b^2d\ln(F)^2}-\frac{3\sqrt{\pi}\,F^a\operatorname{erf}\left(\frac{\sqrt{-b\ln(F)}}{dx+c}\right)}{8\sqrt{-b\ln(F)}\,b^2d\ln(F)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)^2*b)/(d*x+c)^6,x)
```

```
[Out] -1/2*F^a/d*F^(1/(d*x+c)^2*b)/(d*x+c)^3/b/ln(F)+3/4*F^a/d/b^2/ln(F)^2*F^(1/(
d*x+c)^2*b)/(d*x+c)-3/8*F^a/d/b^2/ln(F)^2*Pi^(1/2)/(-b*ln(F))^(1/2)*erf((-b
*ln(F))^(1/2)/(d*x+c))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{(dx+c)^2}}}{(dx+c)^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^6,x, algorithm="maxima")
```

```
[Out] integrate(F^(a + b/(d*x + c)^2)/(d*x + c)^6, x)
```

mupad [B] time = 3.90, size = 105, normalized size = 0.91

$$-\frac{F^a\,F^{\frac{b}{{\left(c+d\,x\right)}^2}}}{2\,b\,d\,\ln\left(F\right)\,{\left(c+d\,x\right)}^3}-\frac{F^a\,\left(3\,\sqrt{\pi }\,\mathrm{erfi}\left(\frac{b\,\ln\left(F\right)}{\sqrt{b\,\ln\left(F\right)}\,\left(c+d\,x\right)}\right)-\frac{6\,F^{\frac{b}{{\left(c+d\,x\right)}^2}}\,\sqrt{b\,\ln\left(F\right)}}{c+d\,x}\right)}{8\,b^2\,d\,{\ln\left(F\right)}^2\,\sqrt{b\,\ln\left(F\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)/(c + d*x)^6,x)
```

```
[Out] - (F^a*F^(b/(c + d*x)^2))/(2*b*d*log(F)*(c + d*x)^3) - (F^a*(3*pi^(1/2)*erf
i((b*log(F))/((b*log(F))^(1/2)*(c + d*x))) - (6*F^(b/(c + d*x)^2)*(b*log(F)
)^(1/2))/(c + d*x)))/(8*b^2*d*log(F)^2*(b*log(F))^(1/2))
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)/(d*x+c)**6,x)
```

```
[Out] Timed out
```

3.336 $\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^8}\,dx$

Optimal. Leaf size=149

$$\frac{15\sqrt{\pi}\,F^a\text{erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(F)}}{c+dx}\right)}{16b^{7/2}d\log^{\frac{7}{2}}(F)}-\frac{15F^{a+\frac{b}{(c+dx)^2}}}{8b^3d\log^3(F)(c+dx)}+\frac{5F^{a+\frac{b}{(c+dx)^2}}}{4b^2d\log^2(F)(c+dx)^3}-\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd\log(F)(c+dx)^5}$$

```
[Out] -15/8*F^(a+b/(d*x+c)^2)/b^3/d/(d*x+c)/ln(F)^3+5/4*F^(a+b/(d*x+c)^2)/b^2/d/(
d*x+c)^3/ln(F)^2-1/2*F^(a+b/(d*x+c)^2)/b/d/(d*x+c)^5/ln(F)+15/16*F^a*erfi(b
^(1/2)*ln(F)^(1/2)/(d*x+c))*Pi^(1/2)/b^(7/2)/d/ln(F)^(7/2)
```

Rubi [A] time = 0.21, antiderivative size = 149, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2212, 2211, 2204}

$$\frac{15\sqrt{\pi}\,F^a\text{Erfi}\left(\frac{\sqrt{b}\,\sqrt{\log(F)}}{c+dx}\right)}{16b^{7/2}d\log^{\frac{7}{2}}(F)}+\frac{5F^{a+\frac{b}{(c+dx)^2}}}{4b^2d\log^2(F)(c+dx)^3}-\frac{15F^{a+\frac{b}{(c+dx)^2}}}{8b^3d\log^3(F)(c+dx)}-\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd\log(F)(c+dx)^5}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2)/(c + d*x)^8,x]
```

```
[Out] (15*F^a*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[F]])/(c + d*x)])/(16*b^(7/2)*d*Log[
F]^(7/2)) - (15*F^(a + b/(c + d*x)^2))/(8*b^3*d*(c + d*x)*Log[F]^3) + (5*F^
(a + b/(c + d*x)^2))/(4*b^2*d*(c + d*x)^3*Log[F]^2) - F^(a + b/(c + d*x)^2)
/(2*b*d*(c + d*x)^5*Log[F])
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2211

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$
\begin{aligned}
\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^8}\,dx &= -\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)^5\log(F)} - \frac{5\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^6}\,dx}{2b\log(F)} \\
&= \frac{5F^{a+\frac{b}{(c+dx)^2}}}{4b^2d(c+dx)^3\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)^5\log(F)} + \frac{15\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^4}\,dx}{4b^2\log^2(F)} \\
&= -\frac{15F^{a+\frac{b}{(c+dx)^2}}}{8b^3d(c+dx)\log^3(F)} + \frac{5F^{a+\frac{b}{(c+dx)^2}}}{4b^2d(c+dx)^3\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)^5\log(F)} - \frac{15\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^2}\,dx}{8b^3\log^3(F)} \\
&= -\frac{15F^{a+\frac{b}{(c+dx)^2}}}{8b^3d(c+dx)\log^3(F)} + \frac{5F^{a+\frac{b}{(c+dx)^2}}}{4b^2d(c+dx)^3\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)^5\log(F)} + \frac{15\,\mathrm{Subst}\left(\int F^{a+bx^2}\,dx\right.}{8b^3d\log^3(F)} \\
&= \frac{15F^a\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{b}\sqrt{\log(F)}}{c+dx}\right)}{16b^{7/2}d\log^{\frac{7}{2}}(F)} - \frac{15F^{a+\frac{b}{(c+dx)^2}}}{8b^3d(c+dx)\log^3(F)} + \frac{5F^{a+\frac{b}{(c+dx)^2}}}{4b^2d(c+dx)^3\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)^5\log(F)}
\end{aligned}
$$

Mathematica [A] time = 0.13, size = 111, normalized size = 0.74

$$
\frac{F^a\left(15\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{b}\sqrt{\log(F)}}{c+dx}\right) - \frac{2\sqrt{b}\sqrt{\log(F)}\,F^{\frac{b}{(c+dx)^2}}\left(4b^2\log^2(F)-10b\log(F)(c+dx)^2+15(c+dx)^4\right)}{(c+dx)^5}\right)}{16b^{7/2}d\log^{\frac{7}{2}}(F)}
$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^2)/(c + d*x)^8,x]
```

```
[Out] (F^a*(15*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[F]])/(c + d*x)] - (2*Sqrt[b]*F^(b/
(c + d*x)^2)*Sqrt[Log[F]]*(15*(c + d*x)^4 - 10*b*(c + d*x)^2*Log[F] + 4*b^2
*Log[F]^2))/(c + d*x)^5))/(16*b^(7/2)*d*Log[F]^(7/2))
```

fricas [B] time = 0.43, size = 305, normalized size = 2.05

$$-\frac{15\sqrt{\pi}\left(d^6x^5+5\,cd^5x^4+10\,c^2d^4x^3+10\,c^3d^3x^2+5\,c^4d^2x+c^5d\right)F^a\sqrt{-\frac{b\log(F)}{d^2}}\,\operatorname{erf}\left(\frac{d\sqrt{-\frac{b\log(F)}{d^2}}}{dx+c}\right)+2\left(4\,b^3\log(F)^3\right.}{16\left(b^4d^6x^5+5\,b^4cd^5x^4+10\,b^4c^2d^4x^3\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^8,x, algorithm="fricas")
```

```
[Out] -1/16*(15*sqrt(pi)*(d^6*x^5 + 5*c*d^5*x^4 + 10*c^2*d^4*x^3 + 10*c^3*d^3*x^2
 + 5*c^4*d^2*x + c^5*d)*F^a*sqrt(-b*log(F)/d^2)*erf(d*sqrt(-b*log(F)/d^2)/(
d*x + c)) + 2*(4*b^3*log(F)^3 - 10*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*lo
g(F)^2 + 15*(b*d^4*x^4 + 4*b*c*d^3*x^3 + 6*b*c^2*d^2*x^2 + 4*b*c^3*d*x + b*
c^4)*log(F))*F^((a*d^2*x^2 + 2*a*c*d*x + a*c^2 + b)/(d^2*x^2 + 2*c*d*x + c^
2)))/((b^4*d^6*x^5 + 5*b^4*c*d^5*x^4 + 10*b^4*c^2*d^4*x^3 + 10*b^4*c^3*d^3*
x^2 + 5*b^4*c^4*d^2*x + b^4*c^5*d)*log(F)^4)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{(dx+c)^2}}}{(dx+c)^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^8,x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c)^2)/(d*x + c)^8, x)
```

maple [A] time = 0.15, size = 142, normalized size = 0.95

$$-\frac{F^aF^{\frac{b}{(dx+c)^2}}}{2\,(dx+c)^5\,bd\ln(F)}+\frac{5F^aF^{\frac{b}{(dx+c)^2}}}{4\,(dx+c)^3\,b^2d\ln(F)^2}-\frac{15F^aF^{\frac{b}{(dx+c)^2}}}{8\,(dx+c)\,b^3d\ln(F)^3}+\frac{15\sqrt{\pi}\,F^a\operatorname{erf}\left(\frac{\sqrt{-b\ln(F)}}{dx+c}\right)}{16\sqrt{-b\ln(F)}\,b^3d\ln(F)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)^2*b)/(d*x+c)^8,x)
```

```
[Out] -1/2*F^a/d*F^(1/(d*x+c)^2*b)/(d*x+c)^5/b/ln(F)+5/4*F^a/d/b^2/ln(F)^2*F^(1/(
d*x+c)^2*b)/(d*x+c)^3-15/8*F^a/d/b^3/ln(F)^3*F^(1/(d*x+c)^2*b)/(d*x+c)+15/1
6*F^a/d/b^3/ln(F)^3*Pi^(1/2)/(-b*ln(F))^(1/2)*erf((-b*ln(F))^(1/2)/(d*x+c))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{(dx+c)^2}}}{(dx+c)^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^8,x, algorithm="maxima")
```

```
[Out] integrate(F^(a + b/(d*x + c)^2)/(d*x + c)^8, x)
```

mupad [B] time = 4.37, size = 142, normalized size = 0.95

$$\frac{5\,F^a\,F^{\frac{b}{(c+d\,x)^2}}}{4\,b^2\,d\ln(F)^2\,(c+d\,x)^3}-\frac{F^a\,F^{\frac{b}{(c+d\,x)^2}}}{2\,b\,d\,\ln(F)\,(c+d\,x)^5}-\frac{15\,F^a\,F^{\frac{b}{(c+d\,x)^2}}}{8\,b^3\,d\ln(F)^3\,(c+d\,x)}+\frac{15\,F^a\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\,\ln(F)}{\sqrt{b\,\ln(F)}\,(c+d\,x)}\right)}{16\,b^3\,d\ln(F)^3\,\sqrt{b\,\ln(F)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)/(c + d*x)^8,x)
```

```
[Out] (5*F^a*F^(b/(c + d*x)^2))/(4*b^2*d*log(F)^2*(c + d*x)^3) - (F^a*F^(b/(c + d
*x)^2))/(2*b*d*log(F)*(c + d*x)^5) - (15*F^a*F^(b/(c + d*x)^2))/(8*b^3*d*lo
g(F)^3*(c + d*x)) + (15*F^a*pi^(1/2)*erfi((b*log(F))/((b*log(F))^(1/2)*(c +
 d*x))))/(16*b^3*d*log(F)^3*(b*log(F))^(1/2))
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)/(d*x+c)**8,x)
```

```
[Out] Timed out
```

3.337 $\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^{10}}\,dx$

Optimal. Leaf size=183

$$-\frac{105\sqrt{\pi}F^a\text{erfi}\left(\frac{\sqrt{b}\sqrt{\log(F)}}{c+dx}\right)}{32b^{9/2}d\log^{\frac{9}{2}}(F)}+\frac{105F^{a+\frac{b}{(c+dx)^2}}}{16b^4d\log^4(F)(c+dx)}-\frac{35F^{a+\frac{b}{(c+dx)^2}}}{8b^3d\log^3(F)(c+dx)^3}+\frac{7F^{a+\frac{b}{(c+dx)^2}}}{4b^2d\log^2(F)(c+dx)^5}-\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd\log(F)\ldots}$$

```
[Out] 105/16*F^(a+b/(d*x+c)^2)/b^4/d/(d*x+c)/ln(F)^4-35/8*F^(a+b/(d*x+c)^2)/b^3/d
/(d*x+c)^3/ln(F)^3+7/4*F^(a+b/(d*x+c)^2)/b^2/d/(d*x+c)^5/ln(F)^2-1/2*F^(a+b
/(d*x+c)^2)/b/d/(d*x+c)^7/ln(F)-105/32*F^a*erfi(b^(1/2)*ln(F)^(1/2)/(d*x+c)
)*Pi^(1/2)/b^(9/2)/d/ln(F)^(9/2)
```

Rubi [A] time = 0.26, antiderivative size = 183, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2212, 2211, 2204}

$$-\frac{105\sqrt{\pi}F^a\text{Erfi}\left(\frac{\sqrt{b}\sqrt{\log(F)}}{c+dx}\right)}{32b^{9/2}d\log^{\frac{9}{2}}(F)}+\frac{7F^{a+\frac{b}{(c+dx)^2}}}{4b^2d\log^2(F)(c+dx)^5}-\frac{35F^{a+\frac{b}{(c+dx)^2}}}{8b^3d\log^3(F)(c+dx)^3}+\frac{105F^{a+\frac{b}{(c+dx)^2}}}{16b^4d\log^4(F)(c+dx)}-\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd\log(F)\ldots}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2)/(c + d*x)^10,x]
```

```
[Out] (-105*F^a*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[F]])/(c + d*x)])/(32*b^(9/2)*d*Lo
g[F]^(9/2)) + (105*F^(a + b/(c + d*x)^2))/(16*b^4*d*(c + d*x)*Log[F]^4) - (
35*F^(a + b/(c + d*x)^2))/(8*b^3*d*(c + d*x)^3*Log[F]^3) + (7*F^(a + b/(c +
 d*x)^2))/(4*b^2*d*(c + d*x)^5*Log[F]^2) - F^(a + b/(c + d*x)^2)/(2*b*d*(c
+ d*x)^7*Log[F])
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2211

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^{10}}\,dx = -\frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)^7\log(F)} - \frac{7\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^8}\,dx}{2b\log(F)}$$

$$= \frac{7F^{a+\frac{b}{(c+dx)^2}}}{4b^2d(c+dx)^5\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)^7\log(F)} + \frac{35\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^6}\,dx}{4b^2\log^2(F)}$$

$$= -\frac{35F^{a+\frac{b}{(c+dx)^2}}}{8b^3d(c+dx)^3\log^3(F)} + \frac{7F^{a+\frac{b}{(c+dx)^2}}}{4b^2d(c+dx)^5\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)^7\log(F)} - \frac{105\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^4}\,dx}{8b^3\log^3(F)}$$

$$= \frac{105F^{a+\frac{b}{(c+dx)^2}}}{16b^4d(c+dx)\log^4(F)} - \frac{35F^{a+\frac{b}{(c+dx)^2}}}{8b^3d(c+dx)^3\log^3(F)} + \frac{7F^{a+\frac{b}{(c+dx)^2}}}{4b^2d(c+dx)^5\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)^7\log(F)}$$

$$= \frac{105F^{a+\frac{b}{(c+dx)^2}}}{16b^4d(c+dx)\log^4(F)} - \frac{35F^{a+\frac{b}{(c+dx)^2}}}{8b^3d(c+dx)^3\log^3(F)} + \frac{7F^{a+\frac{b}{(c+dx)^2}}}{4b^2d(c+dx)^5\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^2}}}{2bd(c+dx)^7\log(F)}$$

$$= -\frac{105F^a\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{b}\sqrt{\log(F)}}{c+dx}\right)}{32b^{9/2}d\log^{\frac{9}{2}}(F)} + \frac{105F^{a+\frac{b}{(c+dx)^2}}}{16b^4d(c+dx)\log^4(F)} - \frac{35F^{a+\frac{b}{(c+dx)^2}}}{8b^3d(c+dx)^3\log^3(F)} + \frac{7F^{a+\frac{b}{(c+dx)^2}}}{4b^2d(c+dx)^5}$$

Mathematica [A] time = 0.16, size = 127, normalized size = 0.69

$$\frac{F^a\left(\frac{2\sqrt{b}\sqrt{\log(F)}\,F^{\frac{b}{(c+dx)^2}}\left(-8b^3\log^3(F)+28b^2\log^2(F)(c+dx)^2-70b\log(F)(c+dx)^4+105(c+dx)^6\right)}{(c+dx)^7}-105\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{b}\sqrt{\log(F)}}{c+dx}\right)\right)}{32b^{9/2}d\log^{\frac{9}{2}}(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^2)/(c + d*x)^10,x]
```

```
[Out] (F^a*(-105*Sqrt[Pi]*Erfi[(Sqrt[b]*Sqrt[Log[F]])/(c + d*x)] + (2*Sqrt[b]*F^(
b/(c + d*x)^2)*Sqrt[Log[F]]*(105*(c + d*x)^6 - 70*b*(c + d*x)^4*Log[F] + 28
*b^2*(c + d*x)^2*Log[F]^2 - 8*b^3*Log[F]^3))/(c + d*x)^7))/(32*b^(9/2)*d*Lo
g[F]^(9/2))
```

fricas [B] time = 0.45, size = 439, normalized size = 2.40

$$\frac{105\sqrt{\pi}\left(d^8x^7+7\,cd^7x^6+21\,c^2d^6x^5+35\,c^3d^5x^4+35\,c^4d^4x^3+21\,c^5d^3x^2+7\,c^6d^2x+c^7d\right)F^a\sqrt{-\frac{b\log(F)}{d^2}}\,\operatorname{erf}\left(\frac{d\sqrt{-}}{d}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^10,x, algorithm="fricas")
```

```
[Out] 1/32*(105*sqrt(pi)*(d^8*x^7 + 7*c*d^7*x^6 + 21*c^2*d^6*x^5 + 35*c^3*d^5*x^4
 + 35*c^4*d^4*x^3 + 21*c^5*d^3*x^2 + 7*c^6*d^2*x + c^7*d)*F^a*sqrt(-b*log(F
)/d^2)*erf(d*sqrt(-b*log(F)/d^2)/(d*x + c)) - 2*(8*b^4*log(F)^4 - 28*(b^3*d
^2*x^2 + 2*b^3*c*d*x + b^3*c^2)*log(F)^3 + 70*(b^2*d^4*x^4 + 4*b^2*c*d^3*x^
3 + 6*b^2*c^2*d^2*x^2 + 4*b^2*c^3*d*x + b^2*c^4)*log(F)^2 - 105*(b*d^6*x^6
+ 6*b*c*d^5*x^5 + 15*b*c^2*d^4*x^4 + 20*b*c^3*d^3*x^3 + 15*b*c^4*d^2*x^2 +
6*b*c^5*d*x + b*c^6)*log(F))*F^((a*d^2*x^2 + 2*a*c*d*x + a*c^2 + b)/(d^2*x^
2 + 2*c*d*x + c^2)))/((b^5*d^8*x^7 + 7*b^5*c*d^7*x^6 + 21*b^5*c^2*d^6*x^5 +
 35*b^5*c^3*d^5*x^4 + 35*b^5*c^4*d^4*x^3 + 21*b^5*c^5*d^3*x^2 + 7*b^5*c^6*d
^2*x + b^5*c^7*d)*log(F)^5)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{(dx+c)^2}}}{(dx+c)^{10}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^10,x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c)^2)/(d*x + c)^10, x)
```

maple [A] time = 0.20, size = 175, normalized size = 0.96

$$-\frac{F^aF^{\frac{b}{(dx+c)^2}}}{2\,(dx+c)^7\,bd\ln(F)}+\frac{7F^aF^{\frac{b}{(dx+c)^2}}}{4\,(dx+c)^5\,b^2d\ln(F)^2}-\frac{35F^aF^{\frac{b}{(dx+c)^2}}}{8\,(dx+c)^3\,b^3d\ln(F)^3}+\frac{105F^aF^{\frac{b}{(dx+c)^2}}}{16\,(dx+c)\,b^4d\ln(F)^4}-\frac{105\sqrt{\pi}\,F^a\operatorname{erf}\left(\frac{\sqrt{-b}}{d}\right.}{32\sqrt{-b\ln(F)}\,b^4d\,\mathrm{l}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)^2*b)/(d*x+c)^10,x)
```

```
[Out] -1/2*F^a/d*F^(1/(d*x+c)^2*b)/(d*x+c)^7/b/ln(F)+7/4*F^a/d/b^2/ln(F)^2*F^(1/(
d*x+c)^2*b)/(d*x+c)^5-35/8*F^a/d/b^3/ln(F)^3*F^(1/(d*x+c)^2*b)/(d*x+c)^3+10
5/16*F^a/d/b^4/ln(F)^4*F^(1/(d*x+c)^2*b)/(d*x+c)-105/32*F^a/d/b^4/ln(F)^4*P
i^(1/2)/(-b*ln(F))^(1/2)*erf((-b*ln(F))^(1/2)/(d*x+c))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{(dx+c)^2}}}{(dx+c)^{10}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^10,x, algorithm="maxima")
```

```
[Out] integrate(F^(a + b/(d*x + c)^2)/(d*x + c)^10, x)
```

mupad [B] time = 4.62, size = 160, normalized size = 0.87

$$-\frac{\frac{F^a\left(105\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\ln(F)}{\sqrt{b\ln(F)}\,(c+d\,x)}\right)-\frac{210\,F^{\frac{b}{(c+d\,x)^2}}\sqrt{b\ln(F)}}{c+d\,x}\right)}{32\sqrt{b\ln(F)}}-\frac{7\,F^a\,F^{\frac{b}{(c+d\,x)^2}}\,b^2\ln(F)^2}{4\,(c+d\,x)^5}+\frac{F^a\,F^{\frac{b}{(c+d\,x)^2}}\,b^3\ln(F)^3}{2\,(c+d\,x)^7}+\frac{35\,F^a\,F^{\frac{b}{(c+d\,x)^2}}\,b\ln(F)}{8\,(c+d\,x)^3}}{b^4\,d\ln(F)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)/(c + d*x)^10,x)
```

```
[Out] -((F^a*(105*pi^(1/2)*erfi((b*log(F))/((b*log(F))^(1/2)*(c + d*x))) - (210*F
^(b/(c + d*x)^2)*(b*log(F))^(1/2))/(c + d*x)))/(32*(b*log(F))^(1/2)) - (7*F
^a*F^(b/(c + d*x)^2)*b^2*log(F)^2)/(4*(c + d*x)^5) + (F^a*F^(b/(c + d*x)^2)
*b^3*log(F)^3)/(2*(c + d*x)^7) + (35*F^a*F^(b/(c + d*x)^2)*b*log(F))/(8*(c
+ d*x)^3))/(b^4*d*log(F)^4)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)/(d*x+c)**10,x)
```

```
[Out] Timed out
```

3.338 $\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^{12}}\,dx$

Optimal. Leaf size=49

$$\frac{F^a\Gamma\left(\frac{11}{2},-\frac{b\log(F)}{(c+dx)^2}\right)}{2d(c+dx)^{11}\left(-\frac{b\log(F)}{(c+dx)^2}\right)^{11/2}}$$

```
[Out] 1/2*F^a*(1048576/61836869254970658257624840625*GAMMA(51/2,-b*ln(F)/(d*x+c)^
2)-1048576/61836869254970658257624840625*(-b*ln(F)/(d*x+c)^2)^(49/2)*exp(b*
ln(F)/(d*x+c)^2)-524288/1261976923570829760359690625*(-b*ln(F)/(d*x+c)^2)^(
47/2)*exp(b*ln(F)/(d*x+c)^2)-262144/26850572841932548092759375*(-b*ln(F)/(d
*x+c)^2)^(45/2)*exp(b*ln(F)/(d*x+c)^2)-131072/596679396487389957616875*(-b*
ln(F)/(d*x+c)^2)^(43/2)*exp(b*ln(F)/(d*x+c)^2)-65536/13876265034590464130062
5*(-b*ln(F)/(d*x+c)^2)^(41/2)*exp(b*ln(F)/(d*x+c)^2)-32768/3384454886485479
05625*(-b*ln(F)/(d*x+c)^2)^(39/2)*exp(b*ln(F)/(d*x+c)^2)-16384/867808945252
6869375*(-b*ln(F)/(d*x+c)^2)^(37/2)*exp(b*ln(F)/(d*x+c)^2)-8192/23454295817
6401875*(-b*ln(F)/(d*x+c)^2)^(35/2)*exp(b*ln(F)/(d*x+c)^2)-4096/67012273764
68625*(-b*ln(F)/(d*x+c)^2)^(33/2)*exp(b*ln(F)/(d*x+c)^2)-2048/2030674962566
25*(-b*ln(F)/(d*x+c)^2)^(31/2)*exp(b*ln(F)/(d*x+c)^2)-1024/6550564395375*(-
b*ln(F)/(d*x+c)^2)^(29/2)*exp(b*ln(F)/(d*x+c)^2)-512/225881530875*(-b*ln(F)
/(d*x+c)^2)^(27/2)*exp(b*ln(F)/(d*x+c)^2)-256/8365982625*(-b*ln(F)/(d*x+c)^
2)^(25/2)*exp(b*ln(F)/(d*x+c)^2)-128/334639305*(-b*ln(F)/(d*x+c)^2)^(23/2)*
exp(b*ln(F)/(d*x+c)^2)-64/14549535*(-b*ln(F)/(d*x+c)^2)^(21/2)*exp(b*ln(F)/
(d*x+c)^2)-32/692835*(-b*ln(F)/(d*x+c)^2)^(19/2)*exp(b*ln(F)/(d*x+c)^2)-16/
36465*(-b*ln(F)/(d*x+c)^2)^(17/2)*exp(b*ln(F)/(d*x+c)^2)-8/2145*(-b*ln(F)/(
d*x+c)^2)^(15/2)*exp(b*ln(F)/(d*x+c)^2)-4/143*(-b*ln(F)/(d*x+c)^2)^(13/2)*e
xp(b*ln(F)/(d*x+c)^2)-2/11*(-b*ln(F)/(d*x+c)^2)^(11/2)*exp(b*ln(F)/(d*x+c)^
2))/d/(d*x+c)^11/(-b*ln(F)/(d*x+c)^2)^(11/2)
```

Rubi [A] time = 0.05, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2218}

$$\frac{F^a\text{Gamma}\left(\frac{11}{2},-\frac{b\log(F)}{(c+dx)^2}\right)}{2d(c+dx)^{11}\left(-\frac{b\log(F)}{(c+dx)^2}\right)^{11/2}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2)/(c + d*x)^12,x]
```

```
[Out] (F^a*Gamma[11/2, -((b*Log[F])/(c + d*x)^2)])/(2*d*(c + d*x)^11*(-((b*Log[F]
)/(c + d*x)^2))^(11/2))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^{12}}\,dx = \frac{F^a\Gamma\left(\frac{11}{2},-\frac{b\log(F)}{(c+dx)^2}\right)}{2d(c+dx)^{11}\left(-\frac{b\log(F)}{(c+dx)^2}\right)^{11/2}}$$

Mathematica [A] time = 0.04, size = 49, normalized size = 1.00

$$\frac{F^a\Gamma\left(\frac{11}{2},-\frac{b\log(F)}{(c+dx)^2}\right)}{2d(c+dx)^{11}\left(-\frac{b\log(F)}{(c+dx)^2}\right)^{11/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^2)/(c + d*x)^12,x]
```

```
[Out] (F^a*Gamma[11/2, -((b*Log[F])/(c + d*x)^2)])/(2*d*(c + d*x)^11*(-((b*Log[F]
)/(c + d*x)^2))^(11/2))
```

fricas [A] time = 0.48, size = 601, normalized size = 12.27

$$-\frac{945\sqrt{\pi}\left(d^{10}x^9+9\,cd^9x^8+36\,c^2d^8x^7+84\,c^3d^7x^6+126\,c^4d^6x^5+126\,c^5d^5x^4+84\,c^6d^4x^3+36\,c^7d^3x^2+9\,c^8d^2x\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^12,x, algorithm="fricas")
```

```
[Out] -1/64*(945*sqrt(pi)*(d^10*x^9 + 9*c*d^9*x^8 + 36*c^2*d^8*x^7 + 84*c^3*d^7*x
^6 + 126*c^4*d^6*x^5 + 126*c^5*d^5*x^4 + 84*c^6*d^4*x^3 + 36*c^7*d^3*x^2 +
```

```
9*c^8*d^2*x + c^9*d)*F^a*sqrt(-b*log(F)/d^2)*erf(d*sqrt(-b*log(F)/d^2)/(d*x
 + c)) + 2*(16*b^5*log(F)^5 - 72*(b^4*d^2*x^2 + 2*b^4*c*d*x + b^4*c^2)*log(
F)^4 + 252*(b^3*d^4*x^4 + 4*b^3*c*d^3*x^3 + 6*b^3*c^2*d^2*x^2 + 4*b^3*c^3*d
*x + b^3*c^4)*log(F)^3 - 630*(b^2*d^6*x^6 + 6*b^2*c*d^5*x^5 + 15*b^2*c^2*d^
4*x^4 + 20*b^2*c^3*d^3*x^3 + 15*b^2*c^4*d^2*x^2 + 6*b^2*c^5*d*x + b^2*c^6)*
log(F)^2 + 945*(b*d^8*x^8 + 8*b*c*d^7*x^7 + 28*b*c^2*d^6*x^6 + 56*b*c^3*d^5
*x^5 + 70*b*c^4*d^4*x^4 + 56*b*c^5*d^3*x^3 + 28*b*c^6*d^2*x^2 + 8*b*c^7*d*x
 + b*c^8)*log(F))*F^((a*d^2*x^2 + 2*a*c*d*x + a*c^2 + b)/(d^2*x^2 + 2*c*d*x
 + c^2)))/((b^6*d^10*x^9 + 9*b^6*c*d^9*x^8 + 36*b^6*c^2*d^8*x^7 + 84*b^6*c^
3*d^7*x^6 + 126*b^6*c^4*d^6*x^5 + 126*b^6*c^5*d^5*x^4 + 84*b^6*c^6*d^4*x^3
+ 36*b^6*c^7*d^3*x^2 + 9*b^6*c^8*d^2*x + b^6*c^9*d)*log(F)^6)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{(dx+c)^2}}}{(dx+c)^{12}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^12,x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c)^2)/(d*x + c)^12, x)
```

maple [A] time = 0.27, size = 208, normalized size = 4.24

$$-\frac{F^{a} F^{\frac{b}{(dx+c)^{2}}}}{2\left(dx+c\right)^{9} b d \ln\left(F\right)}+\frac{9 F^{a} F^{\frac{b}{(dx+c)^{2}}}}{4\left(dx+c\right)^{7} b^{2} d \ln\left(F\right)^{2}}-\frac{63 F^{a} F^{\frac{b}{(dx+c)^{2}}}}{8\left(dx+c\right)^{5} b^{3} d \ln\left(F\right)^{3}}+\frac{315 F^{a} F^{\frac{b}{(dx+c)^{2}}}}{16\left(dx+c\right)^{3} b^{4} d \ln\left(F\right)^{4}}-\frac{945 F^{a} F^{\frac{b}{(dx+c)^{2}}}}{32\left(dx+c\right) b^{5} d \ln(}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)^2*b)/(d*x+c)^12,x)
```

```
[Out] -1/2*F^a/d*F^(1/(d*x+c)^2*b)/(d*x+c)^9/b/ln(F)+9/4*F^a/d/b^2/ln(F)^2*F^(1/(
d*x+c)^2*b)/(d*x+c)^7-63/8*F^a/d/b^3/ln(F)^3*F^(1/(d*x+c)^2*b)/(d*x+c)^5+31
5/16*F^a/d/b^4/ln(F)^4*F^(1/(d*x+c)^2*b)/(d*x+c)^3-945/32*F^a/d/b^5/ln(F)^5
*F^(1/(d*x+c)^2*b)/(d*x+c)+945/64*F^a/d/b^5/ln(F)^5*Pi^(1/2)/(-b*ln(F))^(1/
2)*erf((-b*ln(F))^(1/2)/(d*x+c))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{(dx+c)^2}}}{(dx+c)^{12}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^12,x, algorithm="maxima")
```

```
[Out] integrate(F^(a + b/(d*x + c)^2)/(d*x + c)^12, x)
```

mupad [B] time = 4.92, size = 189, normalized size = 3.86

$$\frac{\frac{F^a\left(945\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\ln(F)}{\sqrt{b\ln(F)}\,(c+d\,x)}\right)-\frac{1890\,F^{\frac{b}{(c+d\,x)^2}}\,\sqrt{b\ln(F)}}{c+d\,x}\right)}{64\sqrt{b\ln(F)}}-\frac{63\,F^a\,F^{\frac{b}{(c+d\,x)^2}}\,b^2\ln(F)^2}{8\,(c+d\,x)^5}+\frac{9\,F^a\,F^{\frac{b}{(c+d\,x)^2}}\,b^3\ln(F)^3}{4\,(c+d\,x)^7}-\frac{F^a\,F^{\frac{b}{(c+d\,x)^2}}\,b^4\ln(F)^4}{2\,(c+d\,x)^9}+\frac{315\,F^a\,F}{16}}{b^5\,d\ln(F)^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)/(c + d*x)^12,x)
```

```
[Out] ((F^a*(945*pi^(1/2)*erfi((b*log(F))/((b*log(F))^(1/2)*(c + d*x))) - (1890*F
^(b/(c + d*x)^2)*(b*log(F))^(1/2))/(c + d*x)))/(64*(b*log(F))^(1/2)) - (63*
F^a*F^(b/(c + d*x)^2)*b^2*log(F)^2)/(8*(c + d*x)^5) + (9*F^a*F^(b/(c + d*x)
^2)*b^3*log(F)^3)/(4*(c + d*x)^7) - (F^a*F^(b/(c + d*x)^2)*b^4*log(F)^4)/(2
*(c + d*x)^9) + (315*F^a*F^(b/(c + d*x)^2)*b*log(F))/(16*(c + d*x)^3))/(b^5
*d*log(F)^5)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)/(d*x+c)**12,x)
```

```
[Out] Timed out
```

3.339 $\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^{14}}\,dx$

Optimal. Leaf size=49

$$\frac{F^a\Gamma\left(\frac{13}{2},-\frac{b\log(F)}{(c+dx)^2}\right)}{2d(c+dx)^{13}\left(-\frac{b\log(F)}{(c+dx)^2}\right)^{13/2}}$$

```
[Out] 1/2*F^a*(524288/5621533568633696205238621875*GAMMA(51/2,-b*ln(F)/(d*x+c)^2)
-524288/5621533568633696205238621875*(-b*ln(F)/(d*x+c)^2)^(49/2)*exp(b*ln(F
)/(d*x+c)^2)-262144/114725174870075432759971875*(-b*ln(F)/(d*x+c)^2)^(47/2)
*exp(b*ln(F)/(d*x+c)^2)-131072/2440961167448413462978125*(-b*ln(F)/(d*x+c)^
2)^(45/2)*exp(b*ln(F)/(d*x+c)^2)-65536/54243581498853632510625*(-b*ln(F)/(d
*x+c)^2)^(43/2)*exp(b*ln(F)/(d*x+c)^2)-32768/1261478639508224011875*(-b*ln(
F)/(d*x+c)^2)^(41/2)*exp(b*ln(F)/(d*x+c)^2)-16384/30767771695322536875*(-b*
ln(F)/(d*x+c)^2)^(39/2)*exp(b*ln(F)/(d*x+c)^2)-8192/788917222956988125*(-b*
ln(F)/(d*x+c)^2)^(37/2)*exp(b*ln(F)/(d*x+c)^2)-4096/21322087106945625*(-b*l
n(F)/(d*x+c)^2)^(35/2)*exp(b*ln(F)/(d*x+c)^2)-2048/609202488769875*(-b*ln(F
)/(d*x+c)^2)^(33/2)*exp(b*ln(F)/(d*x+c)^2)-1024/18460681477875*(-b*ln(F)/(d
*x+c)^2)^(31/2)*exp(b*ln(F)/(d*x+c)^2)-512/595505854125*(-b*ln(F)/(d*x+c)^2
)^(29/2)*exp(b*ln(F)/(d*x+c)^2)-256/20534684625*(-b*ln(F)/(d*x+c)^2)^(27/2)
*exp(b*ln(F)/(d*x+c)^2)-128/760543875*(-b*ln(F)/(d*x+c)^2)^(25/2)*exp(b*ln(
F)/(d*x+c)^2)-64/30421755*(-b*ln(F)/(d*x+c)^2)^(23/2)*exp(b*ln(F)/(d*x+c)^2
)-32/1322685*(-b*ln(F)/(d*x+c)^2)^(21/2)*exp(b*ln(F)/(d*x+c)^2)-16/62985*(-
b*ln(F)/(d*x+c)^2)^(19/2)*exp(b*ln(F)/(d*x+c)^2)-8/3315*(-b*ln(F)/(d*x+c)^2
)^(17/2)*exp(b*ln(F)/(d*x+c)^2)-4/195*(-b*ln(F)/(d*x+c)^2)^(15/2)*exp(b*ln(
F)/(d*x+c)^2)-2/13*(-b*ln(F)/(d*x+c)^2)^(13/2)*exp(b*ln(F)/(d*x+c)^2))/d/(d
*x+c)^13/(-b*ln(F)/(d*x+c)^2)^(13/2)
```

Rubi [A] time = 0.05, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2218}

$$\frac{F^a\text{Gamma}\left(\frac{13}{2},-\frac{b\log(F)}{(c+dx)^2}\right)}{2d(c+dx)^{13}\left(-\frac{b\log(F)}{(c+dx)^2}\right)^{13/2}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^2)/(c + d*x)^14,x]
```

```
[Out] (F^a*Gamma[13/2, -((b*Log[F])/(c + d*x)^2)])/(2*d*(c + d*x)^13*(-((b*Log[F]
)/(c + d*x)^2))^(13/2))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{(c+dx)^2}}}{(c+dx)^{14}}\,dx = \frac{F^a\Gamma\left(\frac{13}{2},-\frac{b\log(F)}{(c+dx)^2}\right)}{2d(c+dx)^{13}\left(-\frac{b\log(F)}{(c+dx)^2}\right)^{13/2}}$$

Mathematica [A] time = 0.03, size = 49, normalized size = 1.00

$$\frac{F^a\Gamma\left(\frac{13}{2},-\frac{b\log(F)}{(c+dx)^2}\right)}{2d(c+dx)^{13}\left(-\frac{b\log(F)}{(c+dx)^2}\right)^{13/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^2)/(c + d*x)^14,x]
```

```
[Out] (F^a*Gamma[13/2, -((b*Log[F])/(c + d*x)^2)])/(2*d*(c + d*x)^13*(-((b*Log[F]
)/(c + d*x)^2))^(13/2))
```

fricas [A] time = 0.50, size = 791, normalized size = 16.14

$$\frac{10395\sqrt{\pi}\left(d^{12}x^{11}+11\,cd^{11}x^{10}+55\,c^2d^{10}x^9+165\,c^3d^9x^8+330\,c^4d^8x^7+462\,c^5d^7x^6+462\,c^6d^6x^5+330\,c^7d^5x^4+\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^14,x, algorithm="fricas")
```

```
[Out] 1/128*(10395*sqrt(pi)*(d^12*x^11 + 11*c*d^11*x^10 + 55*c^2*d^10*x^9 + 165*c
^3*d^9*x^8 + 330*c^4*d^8*x^7 + 462*c^5*d^7*x^6 + 462*c^6*d^6*x^5 + 330*c^7*
d^5*x^4 + 165*c^8*d^4*x^3 + 55*c^9*d^3*x^2 + 11*c^10*d^2*x + c^11*d)*F^a*sq
rt(-b*log(F)/d^2)*erf(d*sqrt(-b*log(F)/d^2)/(d*x + c)) - 2*(32*b^6*log(F)^6
```

```
 - 176*(b^5*d^2*x^2 + 2*b^5*c*d*x + b^5*c^2)*log(F)^5 + 792*(b^4*d^4*x^4 +
4*b^4*c*d^3*x^3 + 6*b^4*c^2*d^2*x^2 + 4*b^4*c^3*d*x + b^4*c^4)*log(F)^4 - 2
772*(b^3*d^6*x^6 + 6*b^3*c*d^5*x^5 + 15*b^3*c^2*d^4*x^4 + 20*b^3*c^3*d^3*x^
3 + 15*b^3*c^4*d^2*x^2 + 6*b^3*c^5*d*x + b^3*c^6)*log(F)^3 + 6930*(b^2*d^8*
x^8 + 8*b^2*c*d^7*x^7 + 28*b^2*c^2*d^6*x^6 + 56*b^2*c^3*d^5*x^5 + 70*b^2*c^
4*d^4*x^4 + 56*b^2*c^5*d^3*x^3 + 28*b^2*c^6*d^2*x^2 + 8*b^2*c^7*d*x + b^2*c
^8)*log(F)^2 - 10395*(b*d^10*x^10 + 10*b*c*d^9*x^9 + 45*b*c^2*d^8*x^8 + 120
*b*c^3*d^7*x^7 + 210*b*c^4*d^6*x^6 + 252*b*c^5*d^5*x^5 + 210*b*c^6*d^4*x^4
+ 120*b*c^7*d^3*x^3 + 45*b*c^8*d^2*x^2 + 10*b*c^9*d*x + b*c^10)*log(F))*F^(
(a*d^2*x^2 + 2*a*c*d*x + a*c^2 + b)/(d^2*x^2 + 2*c*d*x + c^2)))/((b^7*d^12*
x^11 + 11*b^7*c*d^11*x^10 + 55*b^7*c^2*d^10*x^9 + 165*b^7*c^3*d^9*x^8 + 330
*b^7*c^4*d^8*x^7 + 462*b^7*c^5*d^7*x^6 + 462*b^7*c^6*d^6*x^5 + 330*b^7*c^7*
d^5*x^4 + 165*b^7*c^8*d^4*x^3 + 55*b^7*c^9*d^3*x^2 + 11*b^7*c^10*d^2*x + b^
7*c^11*d)*log(F)^7)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{(dx+c)^2}}}{(dx+c)^{14}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^14,x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c)^2)/(d*x + c)^14, x)
```

maple [A] time = 0.36, size = 241, normalized size = 4.92

$$-\frac{F^{a}F^{\frac{b}{(dx+c)^2}}}{2\,(dx+c)^{11}\,bd\ln(F)}+\frac{11F^{a}F^{\frac{b}{(dx+c)^2}}}{4\,(dx+c)^{9}\,b^{2}d\ln(F)^{2}}-\frac{99F^{a}F^{\frac{b}{(dx+c)^2}}}{8\,(dx+c)^{7}\,b^{3}d\ln(F)^{3}}+\frac{693F^{a}F^{\frac{b}{(dx+c)^2}}}{16\,(dx+c)^{5}\,b^{4}d\ln(F)^{4}}-\frac{3465F^{a}F^{\frac{b}{(dx+c}}}{32\,(dx+c)^{3}\,b^{5}d\,\mathrm{l}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)^2*b)/(d*x+c)^14,x)
```

```
[Out] -1/2*F^a/d*F^(1/(d*x+c)^2*b)/(d*x+c)^11/b/ln(F)+11/4*F^a/d/b^2/ln(F)^2*F^(1
/(d*x+c)^2*b)/(d*x+c)^9-99/8*F^a/d/b^3/ln(F)^3*F^(1/(d*x+c)^2*b)/(d*x+c)^7+
693/16*F^a/d/b^4/ln(F)^4*F^(1/(d*x+c)^2*b)/(d*x+c)^5-3465/32*F^a/d/b^5/ln(F
)^5*F^(1/(d*x+c)^2*b)/(d*x+c)^3+10395/64*F^a/d/b^6/ln(F)^6*F^(1/(d*x+c)^2*b
)/(d*x+c)-10395/128*F^a/d/b^6/ln(F)^6*Pi^(1/2)/(-b*ln(F))^(1/2)*erf((-b*ln(
F))^(1/2)/(d*x+c))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{(dx+c)^2}}}{(dx+c)^{14}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^2)/(d*x+c)^14,x, algorithm="maxima")
```

```
[Out] integrate(F^(a + b/(d*x + c)^2)/(d*x + c)^14, x)
```

mupad [B] time = 5.08, size = 217, normalized size = 4.43

$$-\frac{\frac{F^a\left(\frac{10395\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\ln(F)}{\sqrt{b\ln(F)}\,(c+d\,x)}\right)}{128}-\frac{10395\,F^{\frac{b}{(c+d\,x)^2}}\sqrt{b\ln(F)}}{64\,(c+d\,x)}\right)}{\sqrt{b\ln(F)}}-\frac{693\,F^{a+\frac{b}{(c+d\,x)^2}}\,b^2\ln(F)^2}{16\,(c+d\,x)^5}+\frac{99\,F^{a+\frac{b}{(c+d\,x)^2}}\,b^3\ln(F)^3}{8\,(c+d\,x)^7}-\frac{11\,F^{a+\frac{b}{(c+d\,x)^2}}\,b^4\ln(F)^4}{4\,(c+d\,x)^9}+\cdots}{b^6\,d\ln(F)^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^2)/(c + d*x)^14,x)
```

```
[Out] -((F^a*((10395*pi^(1/2)*erfi((b*log(F))/((b*log(F))^(1/2)*(c + d*x))))/128
- (10395*F^(b/(c + d*x)^2)*(b*log(F))^(1/2))/(64*(c + d*x))))/(b*log(F))^(1
/2) - (693*F^(a + b/(c + d*x)^2)*b^2*log(F)^2)/(16*(c + d*x)^5) + (99*F^(a
+ b/(c + d*x)^2)*b^3*log(F)^3)/(8*(c + d*x)^7) - (11*F^(a + b/(c + d*x)^2)*
b^4*log(F)^4)/(4*(c + d*x)^9) + (F^(a + b/(c + d*x)^2)*b^5*log(F)^5)/(2*(c
+ d*x)^11) + (3465*F^(a + b/(c + d*x)^2)*b*log(F))/(32*(c + d*x)^3))/(b^6*d
*log(F)^6)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**2)/(d*x+c)**14,x)
```

```
[Out] Timed out
```

3.340 $\int F^{a+\frac{b}{(c+dx)^3}}(c+dx)^m\,dx$

Optimal. Leaf size=61

$$\frac{F^a(c+dx)^{m+1}\left(-\frac{b\log(F)}{(c+dx)^3}\right)^{\frac{m+1}{3}}\Gamma\left(\frac{1}{3}(-m-1),-\frac{b\log(F)}{(c+dx)^3}\right)}{3d}$$

```
[Out] 1/3*F^a*(d*x+c)^(1+m)*GAMMA(-1/3-1/3*m,-b*ln(F)/(d*x+c)^3)*(-b*ln(F)/(d*x+c
)^3)^(1/3+1/3*m)/d
```

Rubi [A] time = 0.04, antiderivative size = 61, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2218}

$$\frac{F^a(c+dx)^{m+1}\left(-\frac{b\log(F)}{(c+dx)^3}\right)^{\frac{m+1}{3}}\text{Gamma}\left(\frac{1}{3}(-m-1),-\frac{b\log(F)}{(c+dx)^3}\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^3)*(c + d*x)^m,x]
```

```
[Out] (F^a*(c + d*x)^(1 + m)*Gamma[(-1 - m)/3, -((b*Log[F])/(c + d*x)^3)]*(-((b*L
og[F])/(c + d*x)^3))^((1 + m)/3))/(3*d)
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+\frac{b}{(c+dx)^3}}(c+dx)^m\,dx=\frac{F^a(c+dx)^{1+m}\Gamma\left(\frac{1}{3}(-1-m),-\frac{b\log(F)}{(c+dx)^3}\right)\left(-\frac{b\log(F)}{(c+dx)^3}\right)^{\frac{1+m}{3}}}{3d}$$

Mathematica [A] time = 0.04, size = 61, normalized size = 1.00

$$\frac{F^a(c+dx)^{m+1}\left(-\frac{b\log(F)}{(c+dx)^3}\right)^{\frac{m+1}{3}}\Gamma\left(\frac{1}{3}(-m-1),-\frac{b\log(F)}{(c+dx)^3}\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^3)*(c + d*x)^m,x]
```

```
[Out] (F^a*(c + d*x)^(1 + m)*Gamma[(-1 - m)/3, -((b*Log[F])/(c + d*x)^3)]*(-((b*L
og[F])/(c + d*x)^3))^((1 + m)/3))/(3*d)
```

fricas [F] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left((dx+c)^{m}F^{\frac{ad^{3}x^{3}+3\,acd^{2}x^{2}+3\,ac^{2}dx+ac^{3}+b}{d^{3}x^{3}+3\,cd^{2}x^{2}+3\,c^{2}dx+c^{3}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)*(d*x+c)^m,x, algorithm="fricas")
```

```
[Out] integral((d*x + c)^m*F^((a*d^3*x^3 + 3*a*c*d^2*x^2 + 3*a*c^2*d*x + a*c^3 +
b)/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3)), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)^{m}F^{a+\frac{b}{(dx+c)^{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)*(d*x+c)^m,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^m*F^(a + b/(d*x + c)^3), x)
```

maple [F] time = 0.12, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{(dx+c)^{3}}}\,(dx+c)^{m}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b/(d*x+c)^3)*(d*x+c)^m,x)
```

```
[Out] int(F^(a+b/(d*x+c)^3)*(d*x+c)^m,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)^{m}F^{a+\frac{b}{(dx+c)^{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)*(d*x+c)^m,x, algorithm="maxima")
```

```
[Out] integrate((d*x + c)^m*F^(a + b/(d*x + c)^3), x)
```

mupad [B] time = 3.72, size = 73, normalized size = 1.20

$$\frac{F^a\, e^{\frac{b\ln(F)}{2\,(c+d\,x)^3}}\,(c+d\,x)^{m+1}\,\mathrm{M}_{\frac{m}{6}+\frac{2}{3},-\frac{m}{6}-\frac{1}{6}}\left(\frac{b\ln(F)}{(c+d\,x)^3}\right)\left(\frac{b\ln(F)}{(c+d\,x)^3}\right)^{\frac{m}{6}-\frac{1}{3}}}{d\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^3)*(c + d*x)^m,x)
```

```
[Out] (F^a*exp((b*log(F))/(2*(c + d*x)^3))*(c + d*x)^(m + 1)*whittakerM(m/6 + 2/3
, - m/6 - 1/6, (b*log(F))/(c + d*x)^3)*((b*log(F))/(c + d*x)^3)^(m/6 - 1/3)
)/(d*(m + 1))
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**3)*(d*x+c)**m,x)
```

```
[Out] Timed out
```

3.341 $\int F^{a+\frac{b}{(c+dx)^3}}(c+dx)^{14}\,dx$

Optimal. Leaf size=31

$$-\frac{b^5F^a\log^5(F)\Gamma\left(-5,-\frac{b\log(F)}{(c+dx)^3}\right)}{3d}$$

```
[Out] 1/3*F^a*(d*x+c)^15*Ei(6,-b*ln(F)/(d*x+c)^3)/d
```

Rubi [A] time = 0.05, antiderivative size = 31, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2218}

$$-\frac{b^5F^a\log^5(F)\text{Gamma}\left(-5,-\frac{b\log(F)}{(c+dx)^3}\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^3)*(c + d*x)^14,x]
```

```
[Out] -(b^5*F^a*Gamma[-5, -((b*Log[F])/(c + d*x)^3)]*Log[F]^5)/(3*d)
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+\frac{b}{(c+dx)^3}}(c+dx)^{14}\,dx=-\frac{b^5F^a\Gamma\left(-5,-\frac{b\log(F)}{(c+dx)^3}\right)\log^5(F)}{3d}$$

Mathematica [A] time = 0.01, size = 31, normalized size = 1.00

$$-\frac{b^5F^a\log^5(F)\Gamma\left(-5,-\frac{b\log(F)}{(c+dx)^3}\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^3)*(c + d*x)^14,x]
```

```
[Out] -1/3*(b^5*F^a*Gamma[-5, -((b*Log[F])/(c + d*x)^3)]*Log[F]^5)/d
```

fricas [B] time = 0.45, size = 686, normalized size = 22.13

$$-\frac{F^a b^5 \mathrm{Ei}\left(\frac{b\log(F)}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right)\log(F)^5 - \left(24\,d^{15}x^{15} + 360\,cd^{14}x^{14} + 2520\,c^2d^{13}x^{13} + 10920\,c^3d^{12}x^{12} + 32760\,c^4 \cdots\right.}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)*(d*x+c)^14,x, algorithm="fricas")
```

```
[Out] -1/360*(F^a*b^5*Ei(b*log(F)/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))*log(
F)^5 - (24*d^15*x^15 + 360*c*d^14*x^14 + 2520*c^2*d^13*x^13 + 10920*c^3*d^1
2*x^12 + 32760*c^4*d^11*x^11 + 72072*c^5*d^10*x^10 + 120120*c^6*d^9*x^9 + 1
54440*c^7*d^8*x^8 + 154440*c^8*d^7*x^7 + 120120*c^9*d^6*x^6 + 72072*c^10*d^
5*x^5 + 32760*c^11*d^4*x^4 + 10920*c^12*d^3*x^3 + 2520*c^13*d^2*x^2 + 360*c
^14*d*x + 24*c^15 + (b^4*d^3*x^3 + 3*b^4*c*d^2*x^2 + 3*b^4*c^2*d*x + b^4*c^
3)*log(F)^4 + (b^3*d^6*x^6 + 6*b^3*c*d^5*x^5 + 15*b^3*c^2*d^4*x^4 + 20*b^3*
c^3*d^3*x^3 + 15*b^3*c^4*d^2*x^2 + 6*b^3*c^5*d*x + b^3*c^6)*log(F)^3 + 2*(b
^2*d^9*x^9 + 9*b^2*c*d^8*x^8 + 36*b^2*c^2*d^7*x^7 + 84*b^2*c^3*d^6*x^6 + 12
6*b^2*c^4*d^5*x^5 + 126*b^2*c^5*d^4*x^4 + 84*b^2*c^6*d^3*x^3 + 36*b^2*c^7*d
^2*x^2 + 9*b^2*c^8*d*x + b^2*c^9)*log(F)^2 + 6*(b*d^12*x^12 + 12*b*c*d^11*x
^11 + 66*b*c^2*d^10*x^10 + 220*b*c^3*d^9*x^9 + 495*b*c^4*d^8*x^8 + 792*b*c^
5*d^7*x^7 + 924*b*c^6*d^6*x^6 + 792*b*c^7*d^5*x^5 + 495*b*c^8*d^4*x^4 + 220
*b*c^9*d^3*x^3 + 66*b*c^10*d^2*x^2 + 12*b*c^11*d*x + b*c^12)*log(F))*F^((a*
d^3*x^3 + 3*a*c*d^2*x^2 + 3*a*c^2*d*x + a*c^3 + b)/(d^3*x^3 + 3*c*d^2*x^2 +
 3*c^2*d*x + c^3)))/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)^{14} F^{a+\frac{b}{(dx+c)^3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)*(d*x+c)^14,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^14*F^(a + b/(d*x + c)^3), x)
```

maple [F] time = 0.19, size = 0, normalized size = 0.00

$$\int (dx+c)^{14} F^{a+\frac{b}{(dx+c)^3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)^3*b)*(d*x+c)^14,x)
```

```
[Out] int(F^(a+1/(d*x+c)^3*b)*(d*x+c)^14,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{360}\left(24\,F^{a}d^{14}x^{15} + 360\,F^{a}cd^{13}x^{14} + 2520\,F^{a}c^{2}d^{12}x^{13} + 6\left(1820\,F^{a}c^{3}d^{11} + F^{a}bd^{11}\log(F)\right)x^{12} + 72\left(455\,F^{a}c^{4}d^{10} + \right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)*(d*x+c)^14,x, algorithm="maxima")
```

```
[Out] 1/360*(24*F^a*d^14*x^15 + 360*F^a*c*d^13*x^14 + 2520*F^a*c^2*d^12*x^13 + 6*
(1820*F^a*c^3*d^11 + F^a*b*d^11*log(F))*x^12 + 72*(455*F^a*c^4*d^10 + F^a*b
*c*d^10*log(F))*x^11 + 396*(182*F^a*c^5*d^9 + F^a*b*c^2*d^9*log(F))*x^10 +
2*(60060*F^a*c^6*d^8 + 660*F^a*b*c^3*d^8*log(F) + F^a*b^2*d^8*log(F)^2)*x^9
 + 18*(8580*F^a*c^7*d^7 + 165*F^a*b*c^4*d^7*log(F) + F^a*b^2*c*d^7*log(F)^2
)*x^8 + 72*(2145*F^a*c^8*d^6 + 66*F^a*b*c^5*d^6*log(F) + F^a*b^2*c^2*d^6*lo
g(F)^2)*x^7 + (120120*F^a*c^9*d^5 + 5544*F^a*b*c^6*d^5*log(F) + 168*F^a*b^2
*c^3*d^5*log(F)^2 + F^a*b^3*d^5*log(F)^3)*x^6 + 6*(12012*F^a*c^10*d^4 + 792
*F^a*b*c^7*d^4*log(F) + 42*F^a*b^2*c^4*d^4*log(F)^2 + F^a*b^3*c*d^4*log(F)^
3)*x^5 + 3*(10920*F^a*c^11*d^3 + 990*F^a*b*c^8*d^3*log(F) + 84*F^a*b^2*c^5*
d^3*log(F)^2 + 5*F^a*b^3*c^2*d^3*log(F)^3)*x^4 + (10920*F^a*c^12*d^2 + 1320
*F^a*b*c^9*d^2*log(F) + 168*F^a*b^2*c^6*d^2*log(F)^2 + 20*F^a*b^3*c^3*d^2*l
og(F)^3 + F^a*b^4*d^2*log(F)^4)*x^3 + 3*(840*F^a*c^13*d + 132*F^a*b*c^10*d*
log(F) + 24*F^a*b^2*c^7*d*log(F)^2 + 5*F^a*b^3*c^4*d*log(F)^3 + F^a*b^4*c*d
*log(F)^4)*x^2 + 3*(120*F^a*c^14 + 24*F^a*b*c^11*log(F) + 6*F^a*b^2*c^8*log
(F)^2 + 2*F^a*b^3*c^5*log(F)^3 + F^a*b^4*c^2*log(F)^4)*x)*F^(b/(d^3*x^3 + 3
*c*d^2*x^2 + 3*c^2*d*x + c^3)) + integrate(-1/120*(24*F^a*b*c^15*log(F) + 6
*F^a*b^2*c^12*log(F)^2 - F^a*b^5*d^3*x^3*log(F)^5 + 2*F^a*b^3*c^9*log(F)^3
- 3*F^a*b^5*c*d^2*x^2*log(F)^5 + F^a*b^4*c^6*log(F)^4 - 3*F^a*b^5*c^2*d*x*l
og(F)^5)*F^(b/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))/(d^4*x^4 + 4*c*d^3
*x^3 + 6*c^2*d^2*x^2 + 4*c^3*d*x + c^4), x)
```

mupad [B] time = 4.02, size = 136, normalized size = 4.39

$$\frac{F^{a}\,b^{5}\,\ln(F)^{5}\,\mathrm{expint}\left(-\frac{b\,\ln(F)}{(c+d\,x)^{3}}\right)}{360\,d}+\frac{F^{a}\,F^{\frac{b}{(c+d\,x)^{3}}}\,b^{5}\,\ln(F)^{5}\,\left(\frac{(c+d\,x)^{3}}{120\,b\,\ln(F)}+\frac{(c+d\,x)^{6}}{120\,b^{2}\,\ln(F)^{2}}+\frac{(c+d\,x)^{9}}{60\,b^{3}\,\ln(F)^{3}}+\frac{(c+d\,x)^{12}}{20\,b^{4}\,\ln(F)^{4}}+\frac{(c+d\,x)^{15}}{5\,b^{5}\,\ln(F)^{5}}\right)}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^3)*(c + d*x)^14,x)
```

```
[Out] (F^a*b^5*log(F)^5*expint(-(b*log(F))/(c + d*x)^3))/(360*d) + (F^a*F^(b/(c +
 d*x)^3)*b^5*log(F)^5*((c + d*x)^3/(120*b*log(F)) + (c + d*x)^6/(120*b^2*lo
```

```
g(F)^2) + (c + d*x)^9/(60*b^3*log(F)^3) + (c + d*x)^12/(20*b^4*log(F)^4) +
(c + d*x)^15/(5*b^5*log(F)^5)))/(3*d)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**3)*(d*x+c)**14,x)
```

```
[Out] Timed out
```

3.342 $\int F^{a+\frac{b}{(c+dx)^3}}(c+dx)^{11}\,dx$

Optimal. Leaf size=31

$$\frac{b^4F^a\log^4(F)\Gamma\left(-4,-\frac{b\log(F)}{(c+dx)^3}\right)}{3d}$$

```
[Out] 1/3*F^a*(d*x+c)^12*Ei(5,-b*ln(F)/(d*x+c)^3)/d
```

Rubi [A] time = 0.05, antiderivative size = 31, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2218}

$$\frac{b^4F^a\log^4(F)\text{Gamma}\left(-4,-\frac{b\log(F)}{(c+dx)^3}\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^3)*(c + d*x)^11,x]
```

```
[Out] (b^4*F^a*Gamma[-4, -((b*Log[F])/(c + d*x)^3)]*Log[F]^4)/(3*d)
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+\frac{b}{(c+dx)^3}}(c+dx)^{11}\,dx=\frac{b^4F^a\Gamma\left(-4,-\frac{b\log(F)}{(c+dx)^3}\right)\log^4(F)}{3d}$$

Mathematica [A] time = 0.01, size = 31, normalized size = 1.00

$$\frac{b^4F^a\log^4(F)\Gamma\left(-4,-\frac{b\log(F)}{(c+dx)^3}\right)}{3d}$$

Antiderivative was successfully verified.

[In] Integrate[F^(a + b/(c + d*x)^3)*(c + d*x)^11,x]

[Out] (b^4*F^a*Gamma[-4, -((b*Log[F])/(c + d*x)^3)]*Log[F]^4)/(3*d)

fricas [B] time = 0.45, size = 487, normalized size = 15.71

$$-\frac{F^a b^4 \mathrm{Ei}\left(\frac{b \log(F)}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right)\log(F)^4 - \left(6\,d^{12}x^{12} + 72\,cd^{11}x^{11} + 396\,c^2d^{10}x^{10} + 1320\,c^3d^9x^9 + 2970\,c^4d^8x^8 + 4\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b/(d*x+c)^3)*(d*x+c)^11,x, algorithm="fricas")

[Out] -1/72*(F^a*b^4*Ei(b*log(F)/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))*log(F
)^4 - (6*d^12*x^12 + 72*c*d^11*x^11 + 396*c^2*d^10*x^10 + 1320*c^3*d^9*x^9
+ 2970*c^4*d^8*x^8 + 4752*c^5*d^7*x^7 + 5544*c^6*d^6*x^6 + 4752*c^7*d^5*x^5
 + 2970*c^8*d^4*x^4 + 1320*c^9*d^3*x^3 + 396*c^10*d^2*x^2 + 72*c^11*d*x + 6
*c^12 + (b^3*d^3*x^3 + 3*b^3*c*d^2*x^2 + 3*b^3*c^2*d*x + b^3*c^3)*log(F)^3
+ (b^2*d^6*x^6 + 6*b^2*c*d^5*x^5 + 15*b^2*c^2*d^4*x^4 + 20*b^2*c^3*d^3*x^3
+ 15*b^2*c^4*d^2*x^2 + 6*b^2*c^5*d*x + b^2*c^6)*log(F)^2 + 2*(b*d^9*x^9 + 9
*b*c*d^8*x^8 + 36*b*c^2*d^7*x^7 + 84*b*c^3*d^6*x^6 + 126*b*c^4*d^5*x^5 + 12
6*b*c^5*d^4*x^4 + 84*b*c^6*d^3*x^3 + 36*b*c^7*d^2*x^2 + 9*b*c^8*d*x + b*c^9
)*log(F))*F^((a*d^3*x^3 + 3*a*c*d^2*x^2 + 3*a*c^2*d*x + a*c^3 + b)/(d^3*x^3
 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3)))/d

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx + c)^{11} F^{a+\frac{b}{(dx+c)^3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b/(d*x+c)^3)*(d*x+c)^11,x, algorithm="giac")

[Out] integrate((d*x + c)^11*F^(a + b/(d*x + c)^3), x)

maple [F] time = 0.16, size = 0, normalized size = 0.00

$$\int (dx + c)^{11} F^{a+\frac{b}{(dx+c)^3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(F^(a+1/(d*x+c)^3*b)*(d*x+c)^11,x)

[Out] int(F^(a+1/(d*x+c)^3*b)*(d*x+c)^11,x)

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{72}\left(6\,F^{a}d^{11}x^{12}+72\,F^{a}cd^{10}x^{11}+396\,F^{a}c^{2}d^{9}x^{10}+2\left(660\,F^{a}c^{3}d^{8}+F^{a}bd^{8}\log(F)\right)x^{9}+18\left(165\,F^{a}c^{4}d^{7}+F^{a}bcd^{7}\log\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)*(d*x+c)^11,x, algorithm="maxima")
```

```
[Out] 1/72*(6*F^a*d^11*x^12 + 72*F^a*c*d^10*x^11 + 396*F^a*c^2*d^9*x^10 + 2*(660*
F^a*c^3*d^8 + F^a*b*d^8*log(F))*x^9 + 18*(165*F^a*c^4*d^7 + F^a*b*c*d^7*log
(F))*x^8 + 72*(66*F^a*c^5*d^6 + F^a*b*c^2*d^6*log(F))*x^7 + (5544*F^a*c^6*d
^5 + 168*F^a*b*c^3*d^5*log(F) + F^a*b^2*d^5*log(F)^2)*x^6 + 6*(792*F^a*c^7*
d^4 + 42*F^a*b*c^4*d^4*log(F) + F^a*b^2*c*d^4*log(F)^2)*x^5 + 3*(990*F^a*c^
8*d^3 + 84*F^a*b*c^5*d^3*log(F) + 5*F^a*b^2*c^2*d^3*log(F)^2)*x^4 + (1320*F
^a*c^9*d^2 + 168*F^a*b*c^6*d^2*log(F) + 20*F^a*b^2*c^3*d^2*log(F)^2 + F^a*b
^3*d^2*log(F)^3)*x^3 + 3*(132*F^a*c^10*d + 24*F^a*b*c^7*d*log(F) + 5*F^a*b^
2*c^4*d*log(F)^2 + F^a*b^3*c*d*log(F)^3)*x^2 + 3*(24*F^a*c^11 + 6*F^a*b*c^8
*log(F) + 2*F^a*b^2*c^5*log(F)^2 + F^a*b^3*c^2*log(F)^3)*x)*F^(b/(d^3*x^3 +
 3*c*d^2*x^2 + 3*c^2*d*x + c^3)) + integrate(-1/24*(6*F^a*b*c^12*log(F) - F
^a*b^4*d^3*x^3*log(F)^4 + 2*F^a*b^2*c^9*log(F)^2 - 3*F^a*b^4*c*d^2*x^2*log(
F)^4 + F^a*b^3*c^6*log(F)^3 - 3*F^a*b^4*c^2*d*x*log(F)^4)*F^(b/(d^3*x^3 + 3
*c*d^2*x^2 + 3*c^2*d*x + c^3))/(d^4*x^4 + 4*c*d^3*x^3 + 6*c^2*d^2*x^2 + 4*c
^3*d*x + c^4), x)
```

mupad [B] time = 3.83, size = 120, normalized size = 3.87

$$\frac{F^{a}\,b^{4}\ln(F)^{4}\operatorname{expint}\left(-\frac{b\ln(F)}{(c+d\,x)^{3}}\right)}{72\,d}+\frac{F^{a}\,F^{\frac{b}{(c+d\,x)^{3}}}\,b^{4}\ln(F)^{4}\left(\frac{(c+d\,x)^{3}}{24\,b\,\ln(F)}+\frac{(c+d\,x)^{6}}{24\,b^{2}\ln(F)^{2}}+\frac{(c+d\,x)^{9}}{12\,b^{3}\ln(F)^{3}}+\frac{(c+d\,x)^{12}}{4\,b^{4}\ln(F)^{4}}\right)}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^3)*(c + d*x)^11,x)
```

```
[Out] (F^a*b^4*log(F)^4*expint(-(b*log(F))/(c + d*x)^3))/(72*d) + (F^a*F^(b/(c +
d*x)^3)*b^4*log(F)^4*((c + d*x)^3/(24*b*log(F)) + (c + d*x)^6/(24*b^2*log(F
)^2) + (c + d*x)^9/(12*b^3*log(F)^3) + (c + d*x)^12/(4*b^4*log(F)^4)))/(3*d
)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**3)*(d*x+c)**11,x)
```

```
[Out] Timed out
```

3.343 $\int F^{a+\frac{b}{(c+dx)^3}}(c+dx)^8\,dx$

Optimal. Leaf size=121

$$-\frac{b^3F^a\log^3(F)\text{Ei}\left(\frac{b\log(F)}{(c+dx)^3}\right)}{18d}+\frac{b^2\log^2(F)(c+dx)^3F^{a+\frac{b}{(c+dx)^3}}}{18d}+\frac{(c+dx)^9F^{a+\frac{b}{(c+dx)^3}}}{9d}+\frac{b\log(F)(c+dx)^6F^{a+\frac{b}{(c+dx)^3}}}{18d}$$

```
[Out] 1/9*F^(a+b/(d*x+c)^3)*(d*x+c)^9/d+1/18*b*F^(a+b/(d*x+c)^3)*(d*x+c)^6*ln(F)/
d+1/18*b^2*F^(a+b/(d*x+c)^3)*(d*x+c)^3*ln(F)^2/d-1/18*b^3*F^a*Ei(b*ln(F)/(d
*x+c)^3)*ln(F)^3/d
```

Rubi [A] time = 0.19, antiderivative size = 121, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2214, 2210}

$$-\frac{b^3F^a\log^3(F)\text{Ei}\left(\frac{b\log(F)}{(c+dx)^3}\right)}{18d}+\frac{b^2\log^2(F)(c+dx)^3F^{a+\frac{b}{(c+dx)^3}}}{18d}+\frac{(c+dx)^9F^{a+\frac{b}{(c+dx)^3}}}{9d}+\frac{b\log(F)(c+dx)^6F^{a+\frac{b}{(c+dx)^3}}}{18d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^3)*(c + d*x)^8,x]
```

```
[Out] (F^(a + b/(c + d*x)^3)*(c + d*x)^9)/(9*d) + (b*F^(a + b/(c + d*x)^3)*(c + d
*x)^6*Log[F])/(18*d) + (b^2*F^(a + b/(c + d*x)^3)*(c + d*x)^3*Log[F]^2)/(18
*d) - (b^3*F^a*ExpIntegralEi[(b*Log[F])/(c + d*x)^3]*Log[F]^3)/(18*d)
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\int F^{a+\frac{b}{(c+dx)^3}}(c+dx)^8\,dx = \frac{F^{a+\frac{b}{(c+dx)^3}}(c+dx)^9}{9d}+\frac{1}{3}(b\log(F))\int F^{a+\frac{b}{(c+dx)^3}}(c+dx)^5\,dx$$
$$= \frac{F^{a+\frac{b}{(c+dx)^3}}(c+dx)^9}{9d}+\frac{bF^{a+\frac{b}{(c+dx)^3}}(c+dx)^6\log(F)}{18d}+\frac{1}{6}\left(b^2\log^2(F)\right)\int F^{a+\frac{b}{(c+dx)^3}}(c+dx$$
$$= \frac{F^{a+\frac{b}{(c+dx)^3}}(c+dx)^9}{9d}+\frac{bF^{a+\frac{b}{(c+dx)^3}}(c+dx)^6\log(F)}{18d}+\frac{b^2F^{a+\frac{b}{(c+dx)^3}}(c+dx)^3\log^2(F)}{18d}+\frac{1}{6}$$
$$= \frac{F^{a+\frac{b}{(c+dx)^3}}(c+dx)^9}{9d}+\frac{bF^{a+\frac{b}{(c+dx)^3}}(c+dx)^6\log(F)}{18d}+\frac{b^2F^{a+\frac{b}{(c+dx)^3}}(c+dx)^3\log^2(F)}{18d}-\frac{b^3}{}$$

Mathematica [A] time = 0.21, size = 96, normalized size = 0.79

$$\frac{F^a\left(b\log(F)\left(b\log(F)\left((c+dx)^3F^{\frac{b}{(c+dx)^3}}-b\log(F)\text{Ei}\left(\frac{b\log(F)}{(c+dx)^3}\right)\right)+(c+dx)^6F^{\frac{b}{(c+dx)^3}}\right)+2(c+dx)^9F^{\frac{b}{(c+dx)^3}}\right)}{18d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^3)*(c + d*x)^8,x]
```

```
[Out] (F^a*(2*F^(b/(c + d*x)^3)*(c + d*x)^9 + b*Log[F]*(F^(b/(c + d*x)^3)*(c + d*
x)^6 + b*Log[F]*(F^(b/(c + d*x)^3)*(c + d*x)^3 - b*ExpIntegralEi[(b*Log[F])
/(c + d*x)^3]*Log[F]))))/(18*d)
```

fricas [B] time = 0.43, size = 330, normalized size = 2.73

$$-\frac{F^ab^3\text{Ei}\left(\frac{b\log(F)}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right)\log(F)^3-\left(2\,d^9x^9+18\,cd^8x^8+72\,c^2d^7x^7+168\,c^3d^6x^6+252\,c^4d^5x^5+252\,c^5d^4x^4}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)*(d*x+c)^8,x, algorithm="fricas")
```

```
[Out] -1/18*(F^a*b^3*Ei(b*log(F)/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))*log(F
)^3 - (2*d^9*x^9 + 18*c*d^8*x^8 + 72*c^2*d^7*x^7 + 168*c^3*d^6*x^6 + 252*c^
4*d^5*x^5 + 252*c^5*d^4*x^4 + 168*c^6*d^3*x^3 + 72*c^7*d^2*x^2 + 18*c^8*d*x
 + 2*c^9 + (b^2*d^3*x^3 + 3*b^2*c*d^2*x^2 + 3*b^2*c^2*d*x + b^2*c^3)*log(F)
^2 + (b*d^6*x^6 + 6*b*c*d^5*x^5 + 15*b*c^2*d^4*x^4 + 20*b*c^3*d^3*x^3 + 15*
b*c^4*d^2*x^2 + 6*b*c^5*d*x + b*c^6)*log(F))*F^((a*d^3*x^3 + 3*a*c*d^2*x^2
+ 3*a*c^2*d*x + a*c^3 + b)/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3)))/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)^8 F^{a+\frac{b}{(dx+c)^3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)*(d*x+c)^8,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^8*F^(a + b/(d*x + c)^3), x)
```

maple [F] time = 0.14, size = 0, normalized size = 0.00

$$\int (dx+c)^8 F^{a+\frac{b}{(dx+c)^3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)^3*b)*(d*x+c)^8,x)
```

```
[Out] int(F^(a+1/(d*x+c)^3*b)*(d*x+c)^8,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{18}\left(2\,F^a d^8 x^9 + 18\,F^a c d^7 x^8 + 72\,F^a c^2 d^6 x^7 + \left(168\,F^a c^3 d^5 + F^a b d^5 \log(F)\right)x^6 + 6\left(42\,F^a c^4 d^4 + F^a b c d^4 \log(F)\right)x^5 + 3\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)*(d*x+c)^8,x, algorithm="maxima")
```

```
[Out] 1/18*(2*F^a*d^8*x^9 + 18*F^a*c*d^7*x^8 + 72*F^a*c^2*d^6*x^7 + (168*F^a*c^3*
d^5 + F^a*b*d^5*log(F))*x^6 + 6*(42*F^a*c^4*d^4 + F^a*b*c*d^4*log(F))*x^5 +
 3*(84*F^a*c^5*d^3 + 5*F^a*b*c^2*d^3*log(F))*x^4 + (168*F^a*c^6*d^2 + 20*F^
a*b*c^3*d^2*log(F) + F^a*b^2*d^2*log(F)^2)*x^3 + 3*(24*F^a*c^7*d + 5*F^a*b*
c^4*d*log(F) + F^a*b^2*c*d*log(F)^2)*x^2 + 3*(6*F^a*c^8 + 2*F^a*b*c^5*log(F
) + F^a*b^2*c^2*log(F)^2)*x)*F^(b/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3)
) + integrate(1/6*(F^a*b^3*d^3*x^3*log(F)^3 - 2*F^a*b*c^9*log(F) + 3*F^a*b^
3*c*d^2*x^2*log(F)^3 - F^a*b^2*c^6*log(F)^2 + 3*F^a*b^3*c^2*d*x*log(F)^3)*F
^(b/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))/(d^4*x^4 + 4*c*d^3*x^3 + 6*c
^2*d^2*x^2 + 4*c^3*d*x + c^4), x)
```

mupad [B] time = 3.87, size = 92, normalized size = 0.76

$$\frac{F^a\,b^3\,\ln(F)^3\left(\frac{\mathrm{expint}\left(-\frac{b\,\ln(F)}{(c+d\,x)^3}\right)}{6}+F^{\frac{b}{(c+d\,x)^3}}\,\left(\frac{(c+d\,x)^3}{6\,b\,\ln(F)}+\frac{(c+d\,x)^6}{6\,b^2\,\ln(F)^2}+\frac{(c+d\,x)^9}{3\,b^3\,\ln(F)^3}\right)\right)}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^3)*(c + d*x)^8,x)
```

```
[Out] (F^a*b^3*log(F)^3*(expint(-(b*log(F))/(c + d*x)^3)/6 + F^(b/(c + d*x)^3)*((
c + d*x)^3/(6*b*log(F)) + (c + d*x)^6/(6*b^2*log(F)^2) + (c + d*x)^9/(3*b^3
*log(F)^3))))/(3*d)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**3)*(d*x+c)**8,x)
```

```
[Out] Timed out
```

3.344 $\int F^{a+\frac{b}{(c+dx)^3}}(c+dx)^5\,dx$

Optimal. Leaf size=87

$$-\frac{b^2F^a\log^2(F)\text{Ei}\left(\frac{b\log(F)}{(c+dx)^3}\right)}{6d}+\frac{(c+dx)^6F^{a+\frac{b}{(c+dx)^3}}}{6d}+\frac{b\log(F)(c+dx)^3F^{a+\frac{b}{(c+dx)^3}}}{6d}$$

```
[Out] 1/6*F^(a+b/(d*x+c)^3)*(d*x+c)^6/d+1/6*b*F^(a+b/(d*x+c)^3)*(d*x+c)^3*ln(F)/d
-1/6*b^2*F^a*Ei(b*ln(F)/(d*x+c)^3)*ln(F)^2/d
```

Rubi [A] time = 0.14, antiderivative size = 87, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2214, 2210}

$$-\frac{b^2F^a\log^2(F)\text{Ei}\left(\frac{b\log(F)}{(c+dx)^3}\right)}{6d}+\frac{(c+dx)^6F^{a+\frac{b}{(c+dx)^3}}}{6d}+\frac{b\log(F)(c+dx)^3F^{a+\frac{b}{(c+dx)^3}}}{6d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^3)*(c + d*x)^5,x]
```

```
[Out] (F^(a + b/(c + d*x)^3)*(c + d*x)^6)/(6*d) + (b*F^(a + b/(c + d*x)^3)*(c + d
*x)^3*Log[F])/(6*d) - (b^2*F^a*ExpIntegralEi[(b*Log[F])/(c + d*x)^3]*Log[F]
^2)/(6*d)
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\int F^{a+\frac{b}{(c+dx)^3}}(c+dx)^5\,dx = \frac{F^{a+\frac{b}{(c+dx)^3}}(c+dx)^6}{6d} + \frac{1}{2}(b\log(F))\int F^{a+\frac{b}{(c+dx)^3}}(c+dx)^2\,dx$$
$$= \frac{F^{a+\frac{b}{(c+dx)^3}}(c+dx)^6}{6d} + \frac{bF^{a+\frac{b}{(c+dx)^3}}(c+dx)^3\log(F)}{6d} + \frac{1}{2}\left(b^2\log^2(F)\right)\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{c+dx}\,dx$$
$$= \frac{F^{a+\frac{b}{(c+dx)^3}}(c+dx)^6}{6d} + \frac{bF^{a+\frac{b}{(c+dx)^3}}(c+dx)^3\log(F)}{6d} - \frac{b^2F^a\text{Ei}\left(\frac{b\log(F)}{(c+dx)^3}\right)\log^2(F)}{6d}$$

Mathematica [A] time = 0.06, size = 71, normalized size = 0.82

$$\frac{F^a\left(b\log(F)\left((c+dx)^3F^{\frac{b}{(c+dx)^3}} - b\log(F)\text{Ei}\left(\frac{b\log(F)}{(c+dx)^3}\right)\right) + (c+dx)^6F^{\frac{b}{(c+dx)^3}}\right)}{6d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^3)*(c + d*x)^5,x]
```

```
[Out] (F^a*(F^(b/(c + d*x)^3)*(c + d*x)^6 + b*Log[F]*(F^(b/(c + d*x)^3)*(c + d*x)
^3 - b*ExpIntegralEi[(b*Log[F])/(c + d*x)^3]*Log[F])))/(6*d)
```

fricas [B] time = 0.43, size = 213, normalized size = 2.45

$$-\frac{F^ab^2\text{Ei}\left(\frac{b\log(F)}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right)\log(F)^2 - \left(d^6x^6 + 6\,cd^5x^5 + 15\,c^2d^4x^4 + 20\,c^3d^3x^3 + 15\,c^4d^2x^2 + 6\,c^5dx + c^6 + \left(b\right.\right.}{6\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)*(d*x+c)^5,x, algorithm="fricas")
```

```
[Out] -1/6*(F^a*b^2*Ei(b*log(F)/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))*log(F)
^2 - (d^6*x^6 + 6*c*d^5*x^5 + 15*c^2*d^4*x^4 + 20*c^3*d^3*x^3 + 15*c^4*d^2*
x^2 + 6*c^5*d*x + c^6 + (b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3)*l
og(F))*F^((a*d^3*x^3 + 3*a*c*d^2*x^2 + 3*a*c^2*d*x + a*c^3 + b)/(d^3*x^3 +
3*c*d^2*x^2 + 3*c^2*d*x + c^3)))/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)^5F^{a+\frac{b}{(dx+c)^3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)*(d*x+c)^5,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^5*F^(a + b/(d*x + c)^3), x)
```

maple [F] time = 0.12, size = 0, normalized size = 0.00

$$\int (dx+c)^5 F^{a+\frac{b}{(dx+c)^3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)^3*b)*(d*x+c)^5,x)
```

```
[Out] int(F^(a+1/(d*x+c)^3*b)*(d*x+c)^5,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{6}\left(F^a d^5 x^6 + 6\,F^a c d^4 x^5 + 15\,F^a c^2 d^3 x^4 + \left(20\,F^a c^3 d^2 + F^a b d^2 \log(F)\right)x^3 + 3\left(5\,F^a c^4 d + F^a b c d \log(F)\right)x^2 + 3\left(2\,F^a c^5\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)*(d*x+c)^5,x, algorithm="maxima")
```

```
[Out] 1/6*(F^a*d^5*x^6 + 6*F^a*c*d^4*x^5 + 15*F^a*c^2*d^3*x^4 + (20*F^a*c^3*d^2 +
 F^a*b*d^2*log(F))*x^3 + 3*(5*F^a*c^4*d + F^a*b*c*d*log(F))*x^2 + 3*(2*F^a*
c^5 + F^a*b*c^2*log(F))*x)*F^(b/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))
+ integrate(1/2*(F^a*b^2*d^3*x^3*log(F)^2 + 3*F^a*b^2*c*d^2*x^2*log(F)^2 -
F^a*b*c^6*log(F) + 3*F^a*b^2*c^2*d*x*log(F)^2)*F^(b/(d^3*x^3 + 3*c*d^2*x^2
+ 3*c^2*d*x + c^3))/(d^4*x^4 + 4*c*d^3*x^3 + 6*c^2*d^2*x^2 + 4*c^3*d*x + c^
4), x)
```

mupad [B] time = 3.59, size = 76, normalized size = 0.87

$$\frac{F^a\,b^2\,\ln(F)^2\,\left(\frac{\mathrm{expint}\left(-\frac{b\,\ln(F)}{(c+d\,x)^3}\right)}{2}+F^{\frac{b}{(c+d\,x)^3}}\,\left(\frac{(c+d\,x)^3}{2\,b\,\ln(F)}+\frac{(c+d\,x)^6}{2\,b^2\,\ln(F)^2}\right)\right)}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^3)*(c + d*x)^5,x)
```

```
[Out] (F^a*b^2*log(F)^2*(expint(-(b*log(F))/(c + d*x)^3)/2 + F^(b/(c + d*x)^3)*((
c + d*x)^3/(2*b*log(F)) + (c + d*x)^6/(2*b^2*log(F)^2))))/(3*d)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**3)*(d*x+c)**5,x)
[Out] Timed out
```

3.345 $\int F^{a+\frac{b}{(c+dx)^3}}(c+dx)^2\,dx$

Optimal. Leaf size=53

$$\frac{(c+dx)^3F^{a+\frac{b}{(c+dx)^3}}}{3d}-\frac{bF^a\log(F)\text{Ei}\left(\frac{b\log(F)}{(c+dx)^3}\right)}{3d}$$

```
[Out] 1/3*F^(a+b/(d*x+c)^3)*(d*x+c)^3/d-1/3*b*F^a*Ei(b*ln(F)/(d*x+c)^3)*ln(F)/d
```

Rubi [A] time = 0.09, antiderivative size = 53, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2214, 2210}

$$\frac{(c+dx)^3F^{a+\frac{b}{(c+dx)^3}}}{3d}-\frac{bF^a\log(F)\text{Ei}\left(\frac{b\log(F)}{(c+dx)^3}\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^3)*(c + d*x)^2,x]
```

```
[Out] (F^(a + b/(c + d*x)^3)*(c + d*x)^3)/(3*d) - (b*F^a*ExpIntegralEi[(b*Log[F])
/(c + d*x)^3]*Log[F])/(3*d)
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\int F^{a+\frac{b}{(c+dx)^3}}(c+dx)^2\,dx = \frac{F^{a+\frac{b}{(c+dx)^3}}(c+dx)^3}{3d} + (b\log(F))\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{c+dx}\,dx$$
$$= \frac{F^{a+\frac{b}{(c+dx)^3}}(c+dx)^3}{3d} - \frac{bF^a\mathrm{Ei}\left(\frac{b\log(F)}{(c+dx)^3}\right)\log(F)}{3d}$$

Mathematica [A] time = 0.04, size = 47, normalized size = 0.89

$$\frac{F^a\left((c+dx)^3F^{\frac{b}{(c+dx)^3}} - b\log(F)\mathrm{Ei}\left(\frac{b\log(F)}{(c+dx)^3}\right)\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^3)*(c + d*x)^2,x]
```

```
[Out] (F^a*(F^(b/(c + d*x)^3)*(c + d*x)^3 - b*ExpIntegralEi[(b*Log[F])/(c + d*x)^
3]*Log[F]))/(3*d)
```

fricas [B] time = 0.42, size = 141, normalized size = 2.66

$$-\frac{F^a b\mathrm{Ei}\left(\frac{b\log(F)}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right)\log(F) - \left(d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3\right)F^{\frac{ad^3x^3+3\,acd^2x^2+3\,ac^2dx+ac^3+b}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}}}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)*(d*x+c)^2,x, algorithm="fricas")
```

```
[Out] -1/3*(F^a*b*Ei(b*log(F)/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))*log(F) -
 (d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3)*F^((a*d^3*x^3 + 3*a*c*d^2*x^2 +
3*a*c^2*d*x + a*c^3 + b)/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3)))/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)^2F^{a+\frac{b}{(dx+c)^3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)*(d*x+c)^2,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^2*F^(a + b/(d*x + c)^3), x)
```

maple [F] time = 0.11, size = 0, normalized size = 0.00

$$\int (dx+c)^2 F^{a+\frac{b}{(dx+c)^3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)^3*b)*(d*x+c)^2,x)
```

```
[Out] int(F^(a+1/(d*x+c)^3*b)*(d*x+c)^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{3}\left(F^a d^2x^3 + 3\,F^a cdx^2 + 3\,F^a c^2x\right)F^{\frac{b}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}} + \int \frac{\left(F^a bd^3x^3\log(F) + 3\,F^a bcd^2x^2\log(F) + 3\,F^a bc^2dx\log(F)\right)F}{d^4x^4 + 4\,cd^3x^3 + 6\,c^2d^2x^2 + 4\,c^3dx + c^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)*(d*x+c)^2,x, algorithm="maxima")
```

```
[Out] 1/3*(F^a*d^2*x^3 + 3*F^a*c*d*x^2 + 3*F^a*c^2*x)*F^(b/(d^3*x^3 + 3*c*d^2*x^2
 + 3*c^2*d*x + c^3)) + integrate((F^a*b*d^3*x^3*log(F) + 3*F^a*b*c*d^2*x^2*
log(F) + 3*F^a*b*c^2*d*x*log(F))*F^(b/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x +
c^3))/(d^4*x^4 + 4*c*d^3*x^3 + 6*c^2*d^2*x^2 + 4*c^3*d*x + c^4), x)
```

mupad [B] time = 3.72, size = 51, normalized size = 0.96

$$\frac{F^a\,F^{\frac{b}{(c+d\,x)^3}}\,(c+d\,x)^3}{3\,d} + \frac{F^a\,b\,\ln(F)\,\mathrm{expint}\left(-\frac{b\,\ln(F)}{(c+d\,x)^3}\right)}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^3)*(c + d*x)^2,x)
```

```
[Out] (F^a*F^(b/(c + d*x)^3)*(c + d*x)^3)/(3*d) + (F^a*b*log(F)*expint(-(b*log(F)
)/(c + d*x)^3))/(3*d)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{(c+dx)^3}}\,(c+dx)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**3)*(d*x+c)**2,x)
```

```
[Out] Integral(F**(a + b/(c + d*x)**3)*(c + d*x)**2, x)
```

3.346 $\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{c+dx} \, dx$

Optimal. Leaf size=22

$$-\frac{F^a \text{Ei}\left(\frac{b\log(F)}{(c+dx)^3}\right)}{3d}$$

```
[Out] -1/3*F^a*Ei(b*ln(F)/(d*x+c)^3)/d
```

Rubi [A] time = 0.04, antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2210}

$$-\frac{F^a \text{Ei}\left(\frac{b\log(F)}{(c+dx)^3}\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^3)/(c + d*x),x]
```

```
[Out] -(F^a*ExpIntegralEi[(b*Log[F])/(c + d*x)^3])/(3*d)
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{c+dx} \, dx = -\frac{F^a \text{Ei}\left(\frac{b\log(F)}{(c+dx)^3}\right)}{3d}$$

Mathematica [A] time = 0.01, size = 22, normalized size = 1.00

$$-\frac{F^a \text{Ei}\left(\frac{b\log(F)}{(c+dx)^3}\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^3)/(c + d*x),x]
```

```
[Out] -1/3*(F^a*ExpIntegralEi[(b*Log[F])/(c + d*x)^3])/d
```

fricas [B] time = 0.43, size = 42, normalized size = 1.91

$$-\frac{F^{a}\mathrm{Ei}\left(\frac{b\log(F)}{d^{3}x^{3}+3\,cd^{2}x^{2}+3\,c^{2}dx+c^{3}}\right)}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c),x, algorithm="fricas")
[Out] -1/3*F^a*Ei(b*log(F)/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{(dx+c)^{3}}}}{dx+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c),x, algorithm="giac")
[Out] integrate(F^(a + b/(d*x + c)^3)/(d*x + c), x)
```

maple [F] time = 0.10, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{(dx+c)^{3}}}}{dx+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)^3*b)/(d*x+c),x)
[Out] int(F^(a+1/(d*x+c)^3*b)/(d*x+c),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{(dx+c)^{3}}}}{dx+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c),x, algorithm="maxima")
[Out] integrate(F^(a + b/(d*x + c)^3)/(d*x + c), x)
```

mupad [B] time = 3.72, size = 20, normalized size = 0.91

$$-\frac{F^a \operatorname{ei}\left(\frac{b \ln(F)}{(c+d\,x)^3}\right)}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^3)/(c + d*x),x)
[Out] -(F^a*ei((b*log(F))/(c + d*x)^3))/(3*d)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{c+dx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**3)/(d*x+c),x)
[Out] Integral(F**(a + b/(c + d*x)**3)/(c + d*x), x)
```

3.347 $\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^4}\,dx$

Optimal. Leaf size=27

$$-\frac{F^{a+\frac{b}{(c+dx)^3}}}{3bd\log(F)}$$

[Out] -1/3*F^(a+b/(d*x+c)^3)/b/d/ln(F)

Rubi [A] time = 0.04, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2209}

$$-\frac{F^{a+\frac{b}{(c+dx)^3}}}{3bd\log(F)}$$

Antiderivative was successfully verified.

[In] Int[F^(a + b/(c + d*x)^3)/(c + d*x)^4,x]

[Out] -F^(a + b/(c + d*x)^3)/(3*b*d*Log[F])

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^4}\,dx = -\frac{F^{a+\frac{b}{(c+dx)^3}}}{3bd\log(F)}$$

Mathematica [A] time = 0.01, size = 27, normalized size = 1.00

$$-\frac{F^{a+\frac{b}{(c+dx)^3}}}{3bd\log(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^3)/(c + d*x)^4,x]
```

```
[Out] -1/3*F^(a + b/(c + d*x)^3)/(b*d*Log[F])
```

fricas [B] time = 0.42, size = 77, normalized size = 2.85

$$-\frac{F^{\left(\frac{ad^3x^3+3\,acd^2x^2+3\,ac^2dx+ac^3+b}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right)}}{3\,bd\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^4,x, algorithm="fricas")
```

```
[Out] -1/3*F^((a*d^3*x^3 + 3*a*c*d^2*x^2 + 3*a*c^2*d*x + a*c^3 + b)/(d^3*x^3 + 3*
c*d^2*x^2 + 3*c^2*d*x + c^3))/(b*d*log(F))
```

giac [B] time = 0.48, size = 77, normalized size = 2.85

$$-\frac{F^{\left(\frac{ad^3x^3+3\,acd^2x^2+3\,ac^2dx+ac^3+b}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right)}}{3\,bd\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^4,x, algorithm="giac")
```

```
[Out] -1/3*F^((a*d^3*x^3 + 3*a*c*d^2*x^2 + 3*a*c^2*d*x + a*c^3 + b)/(d^3*x^3 + 3*
c*d^2*x^2 + 3*c^2*d*x + c^3))/(b*d*log(F))
```

maple [A] time = 0.00, size = 26, normalized size = 0.96

$$-\frac{F^{a+\frac{b}{\left(dx+c\right)^{3}}}}{3bd\ln\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)^3*b)/(d*x+c)^4,x)
```

```
[Out] -1/3*F^(a+1/(d*x+c)^3*b)/b/d/ln(F)
```

maxima [A] time = 0.61, size = 25, normalized size = 0.93

$$-\frac{F^{a+\frac{b}{\left(dx+c\right)^{3}}}}{3\,bd\log\left(F\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^4,x, algorithm="maxima")
```

```
[Out] -1/3*F^(a + b/(d*x + c)^3)/(b*d*log(F))
```

mupad [B] time = 3.64, size = 48, normalized size = 1.78

$$-\frac{F^a\,F^{\frac{b}{c^3+3\,c^2\,d\,x+3\,c\,d^2\,x^2+d^3\,x^3}}}{3\,b\,d\,\ln(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^3)/(c + d*x)^4,x)
```

```
[Out] -(F^a*F^(b/(c^3 + d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x)))/(3*b*d*log(F))
```

sympy [A] time = 0.40, size = 66, normalized size = 2.44

$$\begin{cases} -\frac{F^{a+\frac{b}{(c+dx)^3}}}{3bd\log(F)} & \text{for } 3bd\log(F) \neq 0 \\ -\frac{1}{3c^3d+9c^2d^2x+9cd^3x^2+3d^4x^3} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**3)/(d*x+c)**4,x)
```

```
[Out] Piecewise((-F**(a + b/(c + d*x)**3)/(3*b*d*log(F)), Ne(3*b*d*log(F), 0)), (
-1/(3*c**3*d + 9*c**2*d**2*x + 9*c*d**3*x**2 + 3*d**4*x**3), True))
```

3.348 $\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^7}\,dx$

Optimal. Leaf size=62

$$\frac{F^{a+\frac{b}{(c+dx)^3}}}{3b^2d\log^2(F)}-\frac{F^{a+\frac{b}{(c+dx)^3}}}{3bd\log(F)(c+dx)^3}$$

```
[Out] 1/3*F^(a+b/(d*x+c)^3)/b^2/d/ln(F)^2-1/3*F^(a+b/(d*x+c)^3)/b/d/(d*x+c)^3/ln(
F)
```

Rubi [A] time = 0.09, antiderivative size = 62, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2212, 2209}

$$\frac{F^{a+\frac{b}{(c+dx)^3}}}{3b^2d\log^2(F)}-\frac{F^{a+\frac{b}{(c+dx)^3}}}{3bd\log(F)(c+dx)^3}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^3)/(c + d*x)^7,x]
```

```
[Out] F^(a + b/(c + d*x)^3)/(3*b^2*d*Log[F]^2) - F^(a + b/(c + d*x)^3)/(3*b*d*(c
+ d*x)^3*Log[F])
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^7}\,dx = -\frac{F^{a+\frac{b}{(c+dx)^3}}}{3bd(c+dx)^3\log(F)} - \frac{\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^4}\,dx}{b\log(F)}$$
$$= \frac{F^{a+\frac{b}{(c+dx)^3}}}{3b^2d\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^3}}}{3bd(c+dx)^3\log(F)}$$

Mathematica [**A**] time = 0.03, size = 47, normalized size = 0.76

$$\frac{F^{a+\frac{b}{(c+dx)^3}}\left((c+dx)^3 - b\log(F)\right)}{3b^2d\log^2(F)(c+dx)^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^3)/(c + d*x)^7,x]
```

```
[Out] (F^(a + b/(c + d*x)^3)*((c + d*x)^3 - b*Log[F]))/(3*b^2*d*(c + d*x)^3*Log[F
]^2)
```

fricas [**B**] time = 0.42, size = 148, normalized size = 2.39

$$\frac{\left(d^3x^3 + 3\,cd^2x^2 + 3\,c^2dx + c^3 - b\log(F)\right)F^{\frac{ad^3x^3+3\,acd^2x^2+3\,ac^2dx+ac^3+b}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}}}{3\left(b^2d^4x^3 + 3\,b^2cd^3x^2 + 3\,b^2c^2d^2x + b^2c^3d\right)\log(F)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^7,x, algorithm="fricas")
```

```
[Out] 1/3*(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3 - b*log(F))*F^((a*d^3*x^3 + 3*
a*c*d^2*x^2 + 3*a*c^2*d*x + a*c^3 + b)/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x +
 c^3))/((b^2*d^4*x^3 + 3*b^2*c*d^3*x^2 + 3*b^2*c^2*d^2*x + b^2*c^3*d)*log(F
)^2)
```

giac [**F**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{(dx+c)^3}}}{(dx+c)^7}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^7,x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c)^3)/(d*x + c)^7, x)
```

maple [B] time = 0.09, size = 261, normalized size = 4.21

$$\frac{\frac{d^5x^6e^{\left(a+\frac{b}{(dx+c)^3}\right)\ln(F)}}{3b^2\ln(F)^2}+\frac{2c\,d^4x^5e^{\left(a+\frac{b}{(dx+c)^3}\right)\ln(F)}}{b^2\ln(F)^2}+\frac{5c^2d^3x^4e^{\left(a+\frac{b}{(dx+c)^3}\right)\ln(F)}}{b^2\ln(F)^2}-\frac{\left(-20c^3+b\ln(F)\right)d^2x^3e^{\left(a+\frac{b}{(dx+c)^3}\right)\ln(F)}}{3b^2\ln(F)^2}-\frac{\left(-5c^3+b\ln(F)\right)cd\,x^2e^{\left(\right.}}{b^2\ln(F)^2}}{(dx+c)^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)^3*b)/(d*x+c)^7,x)
```

```
[Out] (1/3/b^2/ln(F)^2*d^5*x^6*exp((a+1/(d*x+c)^3*b)*ln(F))-c^2*(-2*c^3+b*ln(F))/
b^2/ln(F)^2*x*exp((a+1/(d*x+c)^3*b)*ln(F))-1/3*c^3*(-c^3+b*ln(F))/d/b^2/ln(
F)^2*exp((a+1/(d*x+c)^3*b)*ln(F))-1/3*d^2*(-20*c^3+b*ln(F))/b^2/ln(F)^2*x^3
*exp((a+1/(d*x+c)^3*b)*ln(F))+5*d^3*c^2/b^2/ln(F)^2*x^4*exp((a+1/(d*x+c)^3*
b)*ln(F))+2*d^4*c/b^2/ln(F)^2*x^5*exp((a+1/(d*x+c)^3*b)*ln(F))-c*d*(-5*c^3+
b*ln(F))/b^2/ln(F)^2*x^2*exp((a+1/(d*x+c)^3*b)*ln(F)))/(d*x+c)^6
```

maxima [B] time = 0.65, size = 144, normalized size = 2.32

$$\frac{\left(F^a d^3x^3+3\,F^a cd^2x^2+3\,F^a c^2dx+F^a c^3-F^a b\log(F)\right)F^{\frac{b}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}}}{3\left(b^2d^4x^3\log(F)^2+3\,b^2cd^3x^2\log(F)^2+3\,b^2c^2d^2x\log(F)^2+b^2c^3d\log(F)^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^7,x, algorithm="maxima")
```

```
[Out] 1/3*(F^a*d^3*x^3 + 3*F^a*c*d^2*x^2 + 3*F^a*c^2*d*x + F^a*c^3 - F^a*b*log(F)
)*F^(b/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))/(b^2*d^4*x^3*log(F)^2 + 3
*b^2*c*d^3*x^2*log(F)^2 + 3*b^2*c^2*d^2*x*log(F)^2 + b^2*c^3*d*log(F)^2)
```

mupad [B] time = 3.89, size = 136, normalized size = 2.19

$$\frac{F^a\,F^{\frac{b}{c^3+3\,c^2\,d\,x+3\,c\,d^2\,x^2+d^3\,x^3}}\,\left(\frac{x^3}{3\,b^2\,d\,{\ln(F)}^2}-\frac{b\,\ln(F)-c^3}{3\,b^2\,d^4\,{\ln(F)}^2}+\frac{c\,x^2}{b^2\,d^2\,{\ln(F)}^2}+\frac{c^2\,x}{b^2\,d^3\,{\ln(F)}^2}\right)}{x^3+\frac{c^3}{d^3}+\frac{3\,c\,x^2}{d}+\frac{3\,c^2\,x}{d^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^3)/(c + d*x)^7,x)
```

```
[Out] (F^a*F^(b/(c^3 + d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x))*(x^3/(3*b^2*d*log(F)^2
) - (b*log(F) - c^3)/(3*b^2*d^4*log(F)^2) + (c*x^2)/(b^2*d^2*log(F)^2) + (c
^2*x)/(b^2*d^3*log(F)^2)))/(x^3 + c^3/d^3 + (3*c*x^2)/d + (3*c^2*x)/d^2)
```

sympy [B] time = 0.36, size = 114, normalized size = 1.84

$$\frac{F^{a+\frac{b}{(c+dx)^3}}\left(-b\log{(F)}+c^3+3c^2dx+3cd^2x^2+d^3x^3\right)}{3b^2c^3d\log{(F)}^2+9b^2c^2d^2x\log{(F)}^2+9b^2cd^3x^2\log{(F)}^2+3b^2d^4x^3\log{(F)}^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**3)/(d*x+c)**7,x)
```

```
[Out] F**(a + b/(c + d*x)**3)*(-b*log(F) + c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d*
*3*x**3)/(3*b**2*c**3*d*log(F)**2 + 9*b**2*c**2*d**2*x*log(F)**2 + 9*b**2*c
*d**3*x**2*log(F)**2 + 3*b**2*d**4*x**3*log(F)**2)
```

3.349 $\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^{10}} dx$

Optimal. Leaf size=96

$$-\frac{2F^{a+\frac{b}{(c+dx)^3}}}{3b^3d\log^3(F)}+\frac{2F^{a+\frac{b}{(c+dx)^3}}}{3b^2d\log^2(F)(c+dx)^3}-\frac{F^{a+\frac{b}{(c+dx)^3}}}{3bd\log(F)(c+dx)^6}$$

```
[Out] -2/3*F^(a+b/(d*x+c)^3)/b^3/d/ln(F)^3+2/3*F^(a+b/(d*x+c)^3)/b^2/d/(d*x+c)^3/
ln(F)^2-1/3*F^(a+b/(d*x+c)^3)/b/d/(d*x+c)^6/ln(F)
```

Rubi [A] time = 0.13, antiderivative size = 96, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2212, 2209}

$$\frac{2F^{a+\frac{b}{(c+dx)^3}}}{3b^2d\log^2(F)(c+dx)^3}-\frac{2F^{a+\frac{b}{(c+dx)^3}}}{3b^3d\log^3(F)}-\frac{F^{a+\frac{b}{(c+dx)^3}}}{3bd\log(F)(c+dx)^6}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^3)/(c + d*x)^10,x]
```

```
[Out] (-2*F^(a + b/(c + d*x)^3))/(3*b^3*d*Log[F]^3) + (2*F^(a + b/(c + d*x)^3))/(
3*b^2*d*(c + d*x)^3*Log[F]^2) - F^(a + b/(c + d*x)^3)/(3*b*d*(c + d*x)^6*Lo
g[F])
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^{10}}\,dx = -\frac{F^{a+\frac{b}{(c+dx)^3}}}{3bd(c+dx)^6\log(F)} - \frac{2\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^7}\,dx}{b\log(F)}$$

$$= \frac{2F^{a+\frac{b}{(c+dx)^3}}}{3b^2d(c+dx)^3\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^3}}}{3bd(c+dx)^6\log(F)} + \frac{2\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^4}\,dx}{b^2\log^2(F)}$$

$$= -\frac{2F^{a+\frac{b}{(c+dx)^3}}}{3b^3d\log^3(F)} + \frac{2F^{a+\frac{b}{(c+dx)^3}}}{3b^2d(c+dx)^3\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^3}}}{3bd(c+dx)^6\log(F)}$$

Mathematica [A] time = 0.05, size = 64, normalized size = 0.67

$$-\frac{F^{a+\frac{b}{(c+dx)^3}}\left(b^2\log^2(F) - 2b\log(F)(c+dx)^3 + 2(c+dx)^6\right)}{3b^3d\log^3(F)(c+dx)^6}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^3)/(c + d*x)^10,x]
```

```
[Out] -1/3*(F^(a + b/(c + d*x)^3)*(2*(c + d*x)^6 - 2*b*(c + d*x)^3*Log[F] + b^2*L
og[F]^2))/(b^3*d*(c + d*x)^6*Log[F]^3)
```

fricas [B] time = 0.41, size = 265, normalized size = 2.76

$$-\frac{\left(2\,d^6x^6 + 12\,cd^5x^5 + 30\,c^2d^4x^4 + 40\,c^3d^3x^3 + 30\,c^4d^2x^2 + 12\,c^5dx + 2\,c^6 + b^2\log(F)^2 - 2\left(bd^3x^3 + 3\,bcd^2x^2 + 3\right.\right.}{3\left(b^3d^7x^6 + 6\,b^3cd^6x^5 + 15\,b^3c^2d^5x^4 + 20\,b^3c^3d^4x^3 + 15\,b^3c^4d^3x^2 + 6\,b^3c^5d^2x + b^3\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^10,x, algorithm="fricas")
```

```
[Out] -1/3*(2*d^6*x^6 + 12*c*d^5*x^5 + 30*c^2*d^4*x^4 + 40*c^3*d^3*x^3 + 30*c^4*d
^2*x^2 + 12*c^5*d*x + 2*c^6 + b^2*log(F)^2 - 2*(b*d^3*x^3 + 3*b*c*d^2*x^2 +
 3*b*c^2*d*x + b*c^3)*log(F))*F^((a*d^3*x^3 + 3*a*c*d^2*x^2 + 3*a*c^2*d*x +
 a*c^3 + b)/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))/((b^3*d^7*x^6 + 6*b^
3*c*d^6*x^5 + 15*b^3*c^2*d^5*x^4 + 20*b^3*c^3*d^4*x^3 + 15*b^3*c^4*d^3*x^2
+ 6*b^3*c^5*d^2*x + b^3*c^6*d)*log(F)^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{(dx+c)^3}}}{(dx+c)^{10}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^10,x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c)^3)/(d*x + c)^10, x)
```

maple [B] time = 0.14, size = 434, normalized size = 4.52

$$\frac{-\frac{2d^8x^9 e^{\left(a+\frac{b}{(dx+c)^3}\right)\ln(F)}}{3b^3\ln(F)^3}-\frac{6c\,d^7x^8 e^{\left(a+\frac{b}{(dx+c)^3}\right)\ln(F)}}{b^3\ln(F)^3}-\frac{24c^2d^6x^7 e^{\left(a+\frac{b}{(dx+c)^3}\right)\ln(F)}}{b^3\ln(F)^3}+\frac{2\left(-84c^3+b\ln(F)\right)d^5x^6 e^{\left(a+\frac{b}{(dx+c)^3}\right)\ln(F)}}{3b^3\ln(F)^3}+\frac{4\left(-21c^3+b\ln(F)\right.}{b}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)^3*b)/(d*x+c)^10,x)
```

```
[Out] (-2/3*d^8/ln(F)^3/b^3*x^9*exp((a+1/(d*x+c)^3*b)*ln(F))-c^2*(6*c^6-4*b*c^3*l
n(F)+b^2*ln(F)^2)/b^3/ln(F)^3*x*exp((a+1/(d*x+c)^3*b)*ln(F))-1/3*d^2*(168*c
^6-40*b*c^3*ln(F)+b^2*ln(F)^2)/ln(F)^3/b^3*x^3*exp((a+1/(d*x+c)^3*b)*ln(F))
+2/3*d^5*(-84*c^3+b*ln(F))/ln(F)^3/b^3*x^6*exp((a+1/(d*x+c)^3*b)*ln(F))-24*
d^6*c^2/ln(F)^3/b^3*x^7*exp((a+1/(d*x+c)^3*b)*ln(F))-6*d^7*c/ln(F)^3/b^3*x^
8*exp((a+1/(d*x+c)^3*b)*ln(F))-1/3*(2*c^6-2*b*c^3*ln(F)+b^2*ln(F)^2)*c^3/b^
3/ln(F)^3/d*exp((a+1/(d*x+c)^3*b)*ln(F))-c*d*(24*c^6-10*b*c^3*ln(F)+b^2*ln(
F)^2)/ln(F)^3/b^3*x^2*exp((a+1/(d*x+c)^3*b)*ln(F))+4*c*d^4*(-21*c^3+b*ln(F)
)/ln(F)^3/b^3*x^5*exp((a+1/(d*x+c)^3*b)*ln(F))+2*c^2*d^3*(-42*c^3+5*b*ln(F)
)/ln(F)^3/b^3*x^4*exp((a+1/(d*x+c)^3*b)*ln(F)))/(d*x+c)^9
```

maxima [B] time = 0.89, size = 300, normalized size = 3.12

$$-\frac{\left(2\,F^a d^6x^6+12\,F^a c d^5x^5+30\,F^a c^2d^4x^4+2\,F^a c^6-2\,F^a b c^3\log(F)+F^a b^2\log(F)^2+2\left(20\,F^a c^3d^3-F^a b d^3\log(F)\right)\right.}{3\left(b^3d^7x^6\log(F)^3+6\,b^3 c d^6x^5\log(F)^3+15\,b^3c^2d^5x^4\log(F)^3+20\,b^3c^3d^4x^3\log(F)^3\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^10,x, algorithm="maxima")
```

```
[Out] -1/3*(2*F^a*d^6*x^6 + 12*F^a*c*d^5*x^5 + 30*F^a*c^2*d^4*x^4 + 2*F^a*c^6 - 2
*F^a*b*c^3*log(F) + F^a*b^2*log(F)^2 + 2*(20*F^a*c^3*d^3 - F^a*b*d^3*log(F)
)*x^3 + 6*(5*F^a*c^4*d^2 - F^a*b*c*d^2*log(F))*x^2 + 6*(2*F^a*c^5*d - F^a*b
```

```
*c^2*d*log(F))*x)*F^(b/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))/(b^3*d^7*
x^6*log(F)^3 + 6*b^3*c*d^6*x^5*log(F)^3 + 15*b^3*c^2*d^5*x^4*log(F)^3 + 20*
b^3*c^3*d^4*x^3*log(F)^3 + 15*b^3*c^4*d^3*x^2*log(F)^3 + 6*b^3*c^5*d^2*x*lo
g(F)^3 + b^3*c^6*d*log(F)^3)
```

mupad [B] time = 4.08, size = 263, normalized size = 2.74

$$-\frac{F^a\,F^{\frac{b}{c^3+3\,c^2\,d\,x+3\,c\,d^2\,x^2+d^3\,x^3}}\,\left(\frac{2\,x^6}{3\,b^3\,d\,\ln(F)^3}+\frac{b^2\,\ln(F)^2-2\,b\,c^3\,\ln(F)+2\,c^6}{3\,b^3\,d^7\,\ln(F)^3}+\frac{4\,c\,x^5}{b^3\,d^2\,\ln(F)^3}+\frac{10\,c^2\,x^4}{b^3\,d^3\,\ln(F)^3}-\frac{2\,x^3\,\left(b\,\ln(F)-20\,c^3\right)}{3\,b^3\,d^4\,\ln(F)^3}-\frac{2\,c^2\,x\,\left(b\,\ln(F\right.}{b^3\,d^6\,\ln(}\right.}{x^6+\frac{c^6}{d^6}+\frac{6\,c\,x^5}{d}+\frac{6\,c^5\,x}{d^5}+\frac{15\,c^2\,x^4}{d^2}+\frac{20\,c^3\,x^3}{d^3}+\frac{15\,c^4\,x^2}{d^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^3)/(c + d*x)^10,x)
```

```
[Out] -(F^a*F^(b/(c^3 + d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x))*((2*x^6)/(3*b^3*d*log
(F)^3) + (b^2*log(F)^2 + 2*c^6 - 2*b*c^3*log(F))/(3*b^3*d^7*log(F)^3) + (4*
c*x^5)/(b^3*d^2*log(F)^3) + (10*c^2*x^4)/(b^3*d^3*log(F)^3) - (2*x^3*(b*log
(F) - 20*c^3))/(3*b^3*d^4*log(F)^3) - (2*c^2*x*(b*log(F) - 2*c^3))/(b^3*d^6
*log(F)^3) - (2*c*x^2*(b*log(F) - 5*c^3))/(b^3*d^5*log(F)^3)))/(x^6 + c^6/d
^6 + (6*c*x^5)/d + (6*c^5*x)/d^5 + (15*c^2*x^4)/d^2 + (20*c^3*x^3)/d^3 + (1
5*c^4*x^2)/d^4)
```

sympy [B] time = 0.49, size = 270, normalized size = 2.81

$$\frac{F^{a+\frac{b}{(c+dx)^3}}\left(-b^2\log\left(F\right)^2+2bc^3\log\left(F\right)+6bc^2dx\log\left(F\right)+6bcd^2x^2\log\left(F\right)+2bd^3x^3\log\left(F\right)-2c^6-12c^5dx-30c^4d\right.}{3b^3c^6d\log\left(F\right)^3+18b^3c^5d^2x\log\left(F\right)^3+45b^3c^4d^3x^2\log\left(F\right)^3+60b^3c^3d^4x^3\log\left(F\right)^3+45b^3c^2d^5x^4\log\left(F\right)^3+}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**3)/(d*x+c)**10,x)
```

```
[Out] F**(a + b/(c + d*x)**3)*(-b**2*log(F)**2 + 2*b*c**3*log(F) + 6*b*c**2*d*x*l
og(F) + 6*b*c*d**2*x**2*log(F) + 2*b*d**3*x**3*log(F) - 2*c**6 - 12*c**5*d*
x - 30*c**4*d**2*x**2 - 40*c**3*d**3*x**3 - 30*c**2*d**4*x**4 - 12*c*d**5*x
**5 - 2*d**6*x**6)/(3*b**3*c**6*d*log(F)**3 + 18*b**3*c**5*d**2*x*log(F)**3
 + 45*b**3*c**4*d**3*x**2*log(F)**3 + 60*b**3*c**3*d**4*x**3*log(F)**3 + 45
*b**3*c**2*d**5*x**4*log(F)**3 + 18*b**3*c*d**6*x**5*log(F)**3 + 3*b**3*d**
7*x**6*log(F)**3)
```

3.350 $\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^{13}} dx$

Optimal. Leaf size=123

$$\frac{2F^{a+\frac{b}{(c+dx)^3}}}{b^4 d \log^4(F)} - \frac{2F^{a+\frac{b}{(c+dx)^3}}}{b^3 d \log^3(F)(c+dx)^3} + \frac{F^{a+\frac{b}{(c+dx)^3}}}{b^2 d \log^2(F)(c+dx)^6} - \frac{F^{a+\frac{b}{(c+dx)^3}}}{3bd \log(F)(c+dx)^9}$$

```
[Out] 2*F^(a+b/(d*x+c)^3)/b^4/d/ln(F)^4-2*F^(a+b/(d*x+c)^3)/b^3/d/(d*x+c)^3/ln(F)
^3+F^(a+b/(d*x+c)^3)/b^2/d/(d*x+c)^6/ln(F)^2-1/3*F^(a+b/(d*x+c)^3)/b/d/(d*x
+c)^9/ln(F)
```

Rubi [A] time = 0.19, antiderivative size = 123, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2212, 2209}

$$\frac{F^{a+\frac{b}{(c+dx)^3}}}{b^2 d \log^2(F)(c+dx)^6} - \frac{2F^{a+\frac{b}{(c+dx)^3}}}{b^3 d \log^3(F)(c+dx)^3} + \frac{2F^{a+\frac{b}{(c+dx)^3}}}{b^4 d \log^4(F)} - \frac{F^{a+\frac{b}{(c+dx)^3}}}{3bd \log(F)(c+dx)^9}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^3)/(c + d*x)^13,x]
```

```
[Out] (2*F^(a + b/(c + d*x)^3))/(b^4*d*Log[F]^4) - (2*F^(a + b/(c + d*x)^3))/(b^3
*d*(c + d*x)^3*Log[F]^3) + F^(a + b/(c + d*x)^3)/(b^2*d*(c + d*x)^6*Log[F]^
2) - F^(a + b/(c + d*x)^3)/(3*b*d*(c + d*x)^9*Log[F])
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^{13}}\,dx = -\frac{F^{a+\frac{b}{(c+dx)^3}}}{3bd(c+dx)^9\log(F)} - \frac{3\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^{10}}\,dx}{b\log(F)}$$

$$= \frac{F^{a+\frac{b}{(c+dx)^3}}}{b^2d(c+dx)^6\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^3}}}{3bd(c+dx)^9\log(F)} + \frac{6\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^7}\,dx}{b^2\log^2(F)}$$

$$= -\frac{2F^{a+\frac{b}{(c+dx)^3}}}{b^3d(c+dx)^3\log^3(F)} + \frac{F^{a+\frac{b}{(c+dx)^3}}}{b^2d(c+dx)^6\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^3}}}{3bd(c+dx)^9\log(F)} - \frac{6\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^4}\,dx}{b^3\log^3(F)}$$

$$= \frac{2F^{a+\frac{b}{(c+dx)^3}}}{b^4d\log^4(F)} - \frac{2F^{a+\frac{b}{(c+dx)^3}}}{b^3d(c+dx)^3\log^3(F)} + \frac{F^{a+\frac{b}{(c+dx)^3}}}{b^2d(c+dx)^6\log^2(F)} - \frac{F^{a+\frac{b}{(c+dx)^3}}}{3bd(c+dx)^9\log(F)}$$

Mathematica [A] time = 0.05, size = 73, normalized size = 0.59

$$\frac{F^{a+\frac{b}{(c+dx)^3}}\left(-\frac{b^3\log^3(F)}{(c+dx)^9} + \frac{3b^2\log^2(F)}{(c+dx)^6} - \frac{6b\log(F)}{(c+dx)^3} + 6\right)}{3b^4d\log^4(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^3)/(c + d*x)^13,x]
```

```
[Out] (F^(a + b/(c + d*x)^3)*(6 - (6*b*Log[F])/(c + d*x)^3 + (3*b^2*Log[F]^2)/(c
+ d*x)^6 - (b^3*Log[F]^3)/(c + d*x)^9))/(3*b^4*d*Log[F]^4)
```

fricas [B] time = 0.51, size = 423, normalized size = 3.44

$$\frac{\left(6\,d^9x^9 + 54\,cd^8x^8 + 216\,c^2d^7x^7 + 504\,c^3d^6x^6 + 756\,c^4d^5x^5 + 756\,c^5d^4x^4 + 504\,c^6d^3x^3 + 216\,c^7d^2x^2 + 54\,c^8dx + 6\right.}{3\left(b^4d^{10}x^9 + 9\,b^4cd^9x^8 + 36\,b^4c^2d^8x^7\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^13,x, algorithm="fricas")
```

```
[Out] 1/3*(6*d^9*x^9 + 54*c*d^8*x^8 + 216*c^2*d^7*x^7 + 504*c^3*d^6*x^6 + 756*c^4
*d^5*x^5 + 756*c^5*d^4*x^4 + 504*c^6*d^3*x^3 + 216*c^7*d^2*x^2 + 54*c^8*d*x
```

```
 + 6*c^9 - b^3*log(F)^3 + 3*(b^2*d^3*x^3 + 3*b^2*c*d^2*x^2 + 3*b^2*c^2*d*x
+ b^2*c^3)*log(F)^2 - 6*(b*d^6*x^6 + 6*b*c*d^5*x^5 + 15*b*c^2*d^4*x^4 + 20*
b*c^3*d^3*x^3 + 15*b*c^4*d^2*x^2 + 6*b*c^5*d*x + b*c^6)*log(F))*F^((a*d^3*x
^3 + 3*a*c*d^2*x^2 + 3*a*c^2*d*x + a*c^3 + b)/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^
2*d*x + c^3))/((b^4*d^10*x^9 + 9*b^4*c*d^9*x^8 + 36*b^4*c^2*d^8*x^7 + 84*b^
4*c^3*d^7*x^6 + 126*b^4*c^4*d^6*x^5 + 126*b^4*c^5*d^5*x^4 + 84*b^4*c^6*d^4*
x^3 + 36*b^4*c^7*d^3*x^2 + 9*b^4*c^8*d^2*x + b^4*c^9*d)*log(F)^4)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{(dx+c)^3}}}{(dx+c)^{13}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^13,x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c)^3)/(d*x + c)^13, x)
```

maple [B] time = 0.21, size = 641, normalized size = 5.21

$$\frac{\frac{2d^{11}x^{12}\mathrm{e}^{\left(a+\frac{b}{(dx+c)^3}\right)\ln(F)}}{b^4\ln(F)^4}+\frac{24c\,d^{10}x^{11}\mathrm{e}^{\left(a+\frac{b}{(dx+c)^3}\right)\ln(F)}}{b^4\ln(F)^4}+\frac{132c^2d^9x^{10}\mathrm{e}^{\left(a+\frac{b}{(dx+c)^3}\right)\ln(F)}}{b^4\ln(F)^4}-\frac{2\left(-220c^3+b\ln(F)\right)d^8x^9\mathrm{e}^{\left(a+\frac{b}{(dx+c)^3}\right)\ln(F)}}{b^4\ln(F)^4}-\frac{18\left(-55c^3 \cdots\right.}{}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)^3*b)/(d*x+c)^13,x)
```

```
[Out] (-c*d*(-132*c^9+72*b*c^6*ln(F)-15*b^2*c^3*ln(F)^2+b^3*ln(F)^3)/ln(F)^4/b^4*
x^2*exp((a+1/(d*x+c)^3*b)*ln(F))+3*c^2*d^3*(330*c^6-84*b*c^3*ln(F)+5*b^2*ln
(F)^2)/ln(F)^4/b^4*x^4*exp((a+1/(d*x+c)^3*b)*ln(F))+6*c*d^4*(264*c^6-42*b*c
^3*ln(F)+b^2*ln(F)^2)/ln(F)^4/b^4*x^5*exp((a+1/(d*x+c)^3*b)*ln(F))-72*c^2*d
^6*(-22*c^3+b*ln(F))/ln(F)^4/b^4*x^7*exp((a+1/(d*x+c)^3*b)*ln(F))-18*c*d^7*
(-55*c^3+b*ln(F))/ln(F)^4/b^4*x^8*exp((a+1/(d*x+c)^3*b)*ln(F))+d^5*(1848*c^
6-168*b*c^3*ln(F)+b^2*ln(F)^2)/ln(F)^4/b^4*x^6*exp((a+1/(d*x+c)^3*b)*ln(F))
-2*d^8*(-220*c^3+b*ln(F))/ln(F)^4/b^4*x^9*exp((a+1/(d*x+c)^3*b)*ln(F))+132*
d^9*c^2/ln(F)^4/b^4*x^10*exp((a+1/(d*x+c)^3*b)*ln(F))+24*d^10*c/ln(F)^4/b^4
*x^11*exp((a+1/(d*x+c)^3*b)*ln(F))-1/3*(-6*c^9+6*b*c^6*ln(F)-3*b^2*c^3*ln(F
)^2+b^3*ln(F)^3)*c^3/b^4/ln(F)^4/d*exp((a+1/(d*x+c)^3*b)*ln(F))-c^2*(-24*c^
9+18*b*c^6*ln(F)-6*b^2*c^3*ln(F)^2+b^3*ln(F)^3)/b^4/ln(F)^4*x*exp((a+1/(d*x
+c)^3*b)*ln(F))-1/3*d^2*(-1320*c^9+504*b*c^6*ln(F)-60*b^2*c^3*ln(F)^2+b^3*l
n(F)^3)/ln(F)^4/b^4*x^3*exp((a+1/(d*x+c)^3*b)*ln(F))+2*d^11/ln(F)^4/b^4*x^1
2*exp((a+1/(d*x+c)^3*b)*ln(F)))/(d*x+c)^12
```

maxima [B] time = 0.74, size = 507, normalized size = 4.12

$$\frac{\left(6\,F^{a}d^{9}x^{9}+54\,F^{a}cd^{8}x^{8}+216\,F^{a}c^{2}d^{7}x^{7}+6\,F^{a}c^{9}-6\,F^{a}bc^{6}\log(F)+3\,F^{a}b^{2}c^{3}\log(F)^{2}+6\left(84\,F^{a}c^{3}d^{6}-F^{a}bd^{6}\log(F\right.\right.}{3\left(b^{4}d^{10}x^{9}\log(F)^{4}+9\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^13,x, algorithm="maxima")
```

```
[Out] 1/3*(6*F^a*d^9*x^9 + 54*F^a*c*d^8*x^8 + 216*F^a*c^2*d^7*x^7 + 6*F^a*c^9 - 6
*F^a*b*c^6*log(F) + 3*F^a*b^2*c^3*log(F)^2 + 6*(84*F^a*c^3*d^6 - F^a*b*d^6*
log(F))*x^6 - F^a*b^3*log(F)^3 + 36*(21*F^a*c^4*d^5 - F^a*b*c*d^5*log(F))*x
^5 + 18*(42*F^a*c^5*d^4 - 5*F^a*b*c^2*d^4*log(F))*x^4 + 3*(168*F^a*c^6*d^3
- 40*F^a*b*c^3*d^3*log(F) + F^a*b^2*d^3*log(F)^2)*x^3 + 9*(24*F^a*c^7*d^2 -
 10*F^a*b*c^4*d^2*log(F) + F^a*b^2*c*d^2*log(F)^2)*x^2 + 9*(6*F^a*c^8*d - 4
*F^a*b*c^5*d*log(F) + F^a*b^2*c^2*d*log(F)^2)*x)*F^(b/(d^3*x^3 + 3*c*d^2*x^
2 + 3*c^2*d*x + c^3))/(b^4*d^10*x^9*log(F)^4 + 9*b^4*c*d^9*x^8*log(F)^4 + 3
6*b^4*c^2*d^8*x^7*log(F)^4 + 84*b^4*c^3*d^7*x^6*log(F)^4 + 126*b^4*c^4*d^6*
x^5*log(F)^4 + 126*b^4*c^5*d^5*x^4*log(F)^4 + 84*b^4*c^6*d^4*x^3*log(F)^4 +
 36*b^4*c^7*d^3*x^2*log(F)^4 + 9*b^4*c^8*d^2*x*log(F)^4 + b^4*c^9*d*log(F)^
4)
```

mupad [B] time = 4.59, size = 422, normalized size = 3.43

$$\frac{F^{a}\,F^{\frac{b}{c^{3}+3\,c^{2}\,d\,x+3\,c\,d^{2}\,x^{2}+d^{3}\,x^{3}}}\left(\frac{2\,x^{9}}{b^{4}\,d\ln(F)^{4}}-\frac{b^{3}\ln(F)^{3}-3\,b^{2}\,c^{3}\ln(F)^{2}+6\,b\,c^{6}\,\ln(F)-6\,c^{9}}{3\,b^{4}\,d^{10}\ln(F)^{4}}+\frac{18\,c\,x^{8}}{b^{4}\,d^{2}\ln(F)^{4}}+\frac{72\,c^{2}\,x^{7}}{b^{4}\,d^{3}\ln(F)^{4}}+\frac{x^{3}\left(b^{2}\ln(F)^{2}-40\,b\,c^{3}\,\ln(F\right.}{b^{4}\,d^{7}\ln(F)^{4}}\right.}{x^{9}+\frac{c^{9}}{d^{9}}+\frac{9\,c\,x^{8}}{d}+\frac{9\,c^{8}\,x}{d^{8}}+\frac{36\,c^{2}\,x^{7}}{d^{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^3)/(c + d*x)^13,x)
```

```
[Out] (F^a*F^(b/(c^3 + d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x))*((2*x^9)/(b^4*d*log(F)
^4) - (b^3*log(F)^3 - 6*c^9 + 6*b*c^6*log(F) - 3*b^2*c^3*log(F)^2)/(3*b^4*d
^10*log(F)^4) + (18*c*x^8)/(b^4*d^2*log(F)^4) + (72*c^2*x^7)/(b^4*d^3*log(F
)^4) + (x^3*(b^2*log(F)^2 + 168*c^6 - 40*b*c^3*log(F)))/(b^4*d^7*log(F)^4)
- (2*x^6*(b*log(F) - 84*c^3))/(b^4*d^4*log(F)^4) + (3*c^2*x*(b^2*log(F)^2 +
 6*c^6 - 4*b*c^3*log(F)))/(b^4*d^9*log(F)^4) + (3*c*x^2*(b^2*log(F)^2 + 24*
c^6 - 10*b*c^3*log(F)))/(b^4*d^8*log(F)^4) - (12*c*x^5*(b*log(F) - 21*c^3))
/(b^4*d^5*log(F)^4) - (6*c^2*x^4*(5*b*log(F) - 42*c^3))/(b^4*d^6*log(F)^4))
)/(x^9 + c^9/d^9 + (9*c*x^8)/d + (9*c^8*x)/d^8 + (36*c^2*x^7)/d^2 + (84*c^3
*x^6)/d^3 + (126*c^4*x^5)/d^4 + (126*c^5*x^4)/d^5 + (84*c^6*x^3)/d^6 + (36*
c^7*x^2)/d^7)
```

sympy [B] time = 0.65, size = 484, normalized size = 3.93

$$\frac{F^{a+\frac{b}{(c+dx)^3}}\left(-b^3\log(F)^3+3b^2c^3\log(F)^2+9b^2c^2dx\log(F)^2+9b^2cd^2x^2\log(F)^2+3b^2d^3x^3\log(F)^2-6bc^6\log(F\right.}{3b^4c^9d\log(F)^4+27b^4c^8d^2x\log(F)^4+108b^4c^7d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**3)/(d*x+c)**13,x)
```

```
[Out] F**(a + b/(c + d*x)**3)*(-b**3*log(F)**3 + 3*b**2*c**3*log(F)**2 + 9*b**2*c
**2*d*x*log(F)**2 + 9*b**2*c*d**2*x**2*log(F)**2 + 3*b**2*d**3*x**3*log(F)*
*2 - 6*b*c**6*log(F) - 36*b*c**5*d*x*log(F) - 90*b*c**4*d**2*x**2*log(F) -
120*b*c**3*d**3*x**3*log(F) - 90*b*c**2*d**4*x**4*log(F) - 36*b*c*d**5*x**5
*log(F) - 6*b*d**6*x**6*log(F) + 6*c**9 + 54*c**8*d*x + 216*c**7*d**2*x**2
+ 504*c**6*d**3*x**3 + 756*c**5*d**4*x**4 + 756*c**4*d**5*x**5 + 504*c**3*d
**6*x**6 + 216*c**2*d**7*x**7 + 54*c*d**8*x**8 + 6*d**9*x**9)/(3*b**4*c**9*
d*log(F)**4 + 27*b**4*c**8*d**2*x*log(F)**4 + 108*b**4*c**7*d**3*x**2*log(F
)**4 + 252*b**4*c**6*d**4*x**3*log(F)**4 + 378*b**4*c**5*d**5*x**4*log(F)**
4 + 378*b**4*c**4*d**6*x**5*log(F)**4 + 252*b**4*c**3*d**7*x**6*log(F)**4 +
 108*b**4*c**2*d**8*x**7*log(F)**4 + 27*b**4*c*d**9*x**8*log(F)**4 + 3*b**4
*d**10*x**9*log(F)**4)
```

3.351 $\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^{16}}\,dx$

Optimal. Leaf size=96

$$-\frac{F^{a+\frac{b}{(c+dx)^3}}\left(b^4\log^4(F)-4b^3\log^3(F)(c+dx)^3+12b^2\log^2(F)(c+dx)^6-24b\log(F)(c+dx)^9+24(c+dx)^{12}\right)}{3b^5d\log^5(F)(c+dx)^{12}}$$

```
[Out] -1/3*F^(a+b/(d*x+c)^3)*(24*(d*x+c)^12-24*b*(d*x+c)^9*ln(F)+12*b^2*(d*x+c)^6
*ln(F)^2-4*b^3*(d*x+c)^3*ln(F)^3+b^4*ln(F)^4)/b^5/d/(d*x+c)^12/ln(F)^5
```

Rubi [C] time = 0.04, antiderivative size = 31, normalized size of antiderivative = 0.32, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2218}

$$-\frac{F^a\text{Gamma}\left(5,-\frac{b\log(F)}{(c+dx)^3}\right)}{3b^5d\log^5(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^3)/(c + d*x)^16,x]
```

```
[Out] -(F^a*Gamma[5, -((b*Log[F])/(c + d*x)^3)])/(3*b^5*d*Log[F]^5)
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^{16}}\,dx=-\frac{F^a\Gamma\left(5,-\frac{b\log(F)}{(c+dx)^3}\right)}{3b^5d\log^5(F)}$$

Mathematica [C] time = 0.01, size = 31, normalized size = 0.32

$$-\frac{F^a\Gamma\left(5,-\frac{b\log(F)}{(c+dx)^3}\right)}{3b^5d\log^5(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^3)/(c + d*x)^16,x]
```

```
[Out] -1/3*(F^a*Gamma[5, -((b*Log[F])/(c + d*x)^3)])/(b^5*d*Log[F]^5)
```

fricas [B] time = 0.56, size = 621, normalized size = 6.47

$$-\frac{\left(24\,d^{12}x^{12}+288\,cd^{11}x^{11}+1584\,c^{2}d^{10}x^{10}+5280\,c^{3}d^{9}x^{9}+11880\,c^{4}d^{8}x^{8}+19008\,c^{5}d^{7}x^{7}+22176\,c^{6}d^{6}x^{6}+190\cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^16,x, algorithm="fricas")
```

```
[Out] -1/3*(24*d^12*x^12 + 288*c*d^11*x^11 + 1584*c^2*d^10*x^10 + 5280*c^3*d^9*x^
9 + 11880*c^4*d^8*x^8 + 19008*c^5*d^7*x^7 + 22176*c^6*d^6*x^6 + 19008*c^7*d
^5*x^5 + 11880*c^8*d^4*x^4 + 5280*c^9*d^3*x^3 + 1584*c^10*d^2*x^2 + 288*c^1
1*d*x + 24*c^12 + b^4*log(F)^4 - 4*(b^3*d^3*x^3 + 3*b^3*c*d^2*x^2 + 3*b^3*c
^2*d*x + b^3*c^3)*log(F)^3 + 12*(b^2*d^6*x^6 + 6*b^2*c*d^5*x^5 + 15*b^2*c^2
*d^4*x^4 + 20*b^2*c^3*d^3*x^3 + 15*b^2*c^4*d^2*x^2 + 6*b^2*c^5*d*x + b^2*c^
6)*log(F)^2 - 24*(b*d^9*x^9 + 9*b*c*d^8*x^8 + 36*b*c^2*d^7*x^7 + 84*b*c^3*d
^6*x^6 + 126*b*c^4*d^5*x^5 + 126*b*c^5*d^4*x^4 + 84*b*c^6*d^3*x^3 + 36*b*c^
7*d^2*x^2 + 9*b*c^8*d*x + b*c^9)*log(F))*F^((a*d^3*x^3 + 3*a*c*d^2*x^2 + 3*
a*c^2*d*x + a*c^3 + b)/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))/((b^5*d^1
3*x^12 + 12*b^5*c*d^12*x^11 + 66*b^5*c^2*d^11*x^10 + 220*b^5*c^3*d^10*x^9 +
 495*b^5*c^4*d^9*x^8 + 792*b^5*c^5*d^8*x^7 + 924*b^5*c^6*d^7*x^6 + 792*b^5*
c^7*d^6*x^5 + 495*b^5*c^8*d^5*x^4 + 220*b^5*c^9*d^4*x^3 + 66*b^5*c^10*d^3*x
^2 + 12*b^5*c^11*d^2*x + b^5*c^12*d)*log(F)^5)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{(dx+c)^{3}}}}{(dx+c)^{16}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^16,x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c)^3)/(d*x + c)^16, x)
```

maple [B] time = 0.31, size = 889, normalized size = 9.26

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)^3*b)/(d*x+c)^16,x)
```

```
[Out] (-d*c*(840*c^12-528*ln(F)*b*c^9+144*b^2*c^6*ln(F)^2-20*ln(F)^3*b^3*c^3+b^4*
ln(F)^4)/b^5/ln(F)^5*x^2*exp((a+1/(d*x+c)^3*b)*ln(F))+4*c^2*d^3*(-2730*c^9+
990*b*c^6*ln(F)-126*b^2*c^3*ln(F)^2+5*b^3*ln(F)^3)/ln(F)^5/b^5*x^4*exp((a+1
/(d*x+c)^3*b)*ln(F))+8*c*d^4*(-3003*c^9+792*b*c^6*ln(F)-63*b^2*c^3*ln(F)^2+
b^3*ln(F)^3)/ln(F)^5/b^5*x^5*exp((a+1/(d*x+c)^3*b)*ln(F))-72*c^2*d^6*(715*c
^6-88*b*c^3*ln(F)+2*b^2*ln(F)^2)/ln(F)^5/b^5*x^7*exp((a+1/(d*x+c)^3*b)*ln(F
))-36*c*d^7*(1430*c^6-110*b*c^3*ln(F)+b^2*ln(F)^2)/ln(F)^5/b^5*x^8*exp((a+1
/(d*x+c)^3*b)*ln(F))+264*c^2*d^9*(-91*c^3+2*b*ln(F))/ln(F)^5/b^5*x^10*exp((
a+1/(d*x+c)^3*b)*ln(F))+24*c*d^10*(-455*c^3+4*b*ln(F))/ln(F)^5/b^5*x^11*exp
((a+1/(d*x+c)^3*b)*ln(F))-4*d^8*(10010*c^6-440*b*c^3*ln(F)+b^2*ln(F)^2)/ln(
F)^5/b^5*x^9*exp((a+1/(d*x+c)^3*b)*ln(F))+8*d^11*(-455*c^3+b*ln(F))/ln(F)^5
/b^5*x^12*exp((a+1/(d*x+c)^3*b)*ln(F))-840*d^12*c^2/ln(F)^5/b^5*x^13*exp((a
+1/(d*x+c)^3*b)*ln(F))-120*d^13*c/ln(F)^5/b^5*x^14*exp((a+1/(d*x+c)^3*b)*ln
(F))-8*d^14/ln(F)^5/b^5*x^15*exp((a+1/(d*x+c)^3*b)*ln(F))-1/3*(24*c^12-24*l
n(F)*b*c^9+12*b^2*c^6*ln(F)^2-4*ln(F)^3*b^3*c^3+b^4*ln(F)^4)*c^3/b^5/ln(F)^
5/d*exp((a+1/(d*x+c)^3*b)*ln(F))-c^2*(120*c^12-96*ln(F)*b*c^9+36*b^2*c^6*ln
(F)^2-8*ln(F)^3*b^3*c^3+b^4*ln(F)^4)/b^5/ln(F)^5*x*exp((a+1/(d*x+c)^3*b)*ln
(F))-1/3*d^2*(10920*c^12-5280*ln(F)*b*c^9+1008*b^2*c^6*ln(F)^2-80*ln(F)^3*b
^3*c^3+b^4*ln(F)^4)/ln(F)^5/b^5*x^3*exp((a+1/(d*x+c)^3*b)*ln(F))+4/3*d^5*(-
30030*c^9+5544*b*c^6*ln(F)-252*b^2*c^3*ln(F)^2+b^3*ln(F)^3)/ln(F)^5/b^5*x^6
*exp((a+1/(d*x+c)^3*b)*ln(F)))/(d*x+c)^15
```

maxima [B] time = 1.16, size = 770, normalized size = 8.02

$$-\frac{\left(24\,F^a d^{12} x^{12} + 288\,F^a c d^{11} x^{11} + 1584\,F^a c^2 d^{10} x^{10} + 24\,F^a c^{12} - 24\,F^a b c^9 \log(F) + 12\,F^a b^2 c^6 \log(F)^2 + 24\,\left(220\,F^a c\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^16,x, algorithm="maxima")
```

```
[Out] -1/3*(24*F^a*d^12*x^12 + 288*F^a*c*d^11*x^11 + 1584*F^a*c^2*d^10*x^10 + 24*
F^a*c^12 - 24*F^a*b*c^9*log(F) + 12*F^a*b^2*c^6*log(F)^2 + 24*(220*F^a*c^3*
d^9 - F^a*b*d^9*log(F))*x^9 - 4*F^a*b^3*c^3*log(F)^3 + 216*(55*F^a*c^4*d^8
- F^a*b*c*d^8*log(F))*x^8 + F^a*b^4*log(F)^4 + 864*(22*F^a*c^5*d^7 - F^a*b*
c^2*d^7*log(F))*x^7 + 12*(1848*F^a*c^6*d^6 - 168*F^a*b*c^3*d^6*log(F) + F^a
*b^2*d^6*log(F)^2)*x^6 + 72*(264*F^a*c^7*d^5 - 42*F^a*b*c^4*d^5*log(F) + F^
a*b^2*c*d^5*log(F)^2)*x^5 + 36*(330*F^a*c^8*d^4 - 84*F^a*b*c^5*d^4*log(F) +
 5*F^a*b^2*c^2*d^4*log(F)^2)*x^4 + 4*(1320*F^a*c^9*d^3 - 504*F^a*b*c^6*d^3*
log(F) + 60*F^a*b^2*c^3*d^3*log(F)^2 - F^a*b^3*d^3*log(F)^3)*x^3 + 12*(132*
F^a*c^10*d^2 - 72*F^a*b*c^7*d^2*log(F) + 15*F^a*b^2*c^4*d^2*log(F)^2 - F^a*
b^3*c*d^2*log(F)^3)*x^2 + 12*(24*F^a*c^11*d - 18*F^a*b*c^8*d*log(F) + 6*F^a
*b^2*c^5*d*log(F)^2 - F^a*b^3*c^2*d*log(F)^3)*x)*F^(b/(d^3*x^3 + 3*c*d^2*x^
```

```
2 + 3*c^2*d*x + c^3))/(b^5*d^13*x^12*log(F)^5 + 12*b^5*c*d^12*x^11*log(F)^5
 + 66*b^5*c^2*d^11*x^10*log(F)^5 + 220*b^5*c^3*d^10*x^9*log(F)^5 + 495*b^5*
c^4*d^9*x^8*log(F)^5 + 792*b^5*c^5*d^8*x^7*log(F)^5 + 924*b^5*c^6*d^7*x^6*l
og(F)^5 + 792*b^5*c^7*d^6*x^5*log(F)^5 + 495*b^5*c^8*d^5*x^4*log(F)^5 + 220
*b^5*c^9*d^4*x^3*log(F)^5 + 66*b^5*c^10*d^3*x^2*log(F)^5 + 12*b^5*c^11*d^2*
x*log(F)^5 + b^5*c^12*d*log(F)^5)
```

mupad [B] time = 5.15, size = 620, normalized size = 6.46

$$-\frac{F^a\,F^{\frac{b}{c^3+3\,c^2\,d\,x+3\,c\,d^2\,x^2+d^3\,x^3}}\,\left(\frac{b^4\,\ln(F)^4-4\,b^3\,c^3\,\ln(F)^3+12\,b^2\,c^6\,\ln(F)^2-24\,b\,c^9\,\ln(F)+24\,c^{12}}{3\,b^5\,d^{13}\,\ln(F)^5}+\frac{8\,x^{12}}{b^5\,d\,\ln(F)^5}+\frac{96\,c\,x^{11}}{b^5\,d^2\,\ln(F)^5}+\frac{528\,c^2\,x^{10}}{b^5\,d^3\,\ln(F)^5}-\frac{4\,x}{}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^3)/(c + d*x)^16,x)
```

```
[Out] -(F^a*F^(b/(c^3 + d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x))*((b^4*log(F)^4 + 24*c
^12 - 24*b*c^9*log(F) - 4*b^3*c^3*log(F)^3 + 12*b^2*c^6*log(F)^2)/(3*b^5*d^
13*log(F)^5) + (8*x^12)/(b^5*d*log(F)^5) + (96*c*x^11)/(b^5*d^2*log(F)^5) +
 (528*c^2*x^10)/(b^5*d^3*log(F)^5) - (4*x^3*(b^3*log(F)^3 - 1320*c^9 + 504*
b*c^6*log(F) - 60*b^2*c^3*log(F)^2))/(3*b^5*d^10*log(F)^5) + (4*x^6*(b^2*lo
g(F)^2 + 1848*c^6 - 168*b*c^3*log(F)))/(b^5*d^7*log(F)^5) - (8*x^9*(b*log(F
) - 220*c^3))/(b^5*d^4*log(F)^5) - (4*c^2*x*(b^3*log(F)^3 - 24*c^9 + 18*b*c
^6*log(F) - 6*b^2*c^3*log(F)^2))/(b^5*d^12*log(F)^5) - (4*c*x^2*(b^3*log(F)
^3 - 132*c^9 + 72*b*c^6*log(F) - 15*b^2*c^3*log(F)^2))/(b^5*d^11*log(F)^5)
+ (24*c*x^5*(b^2*log(F)^2 + 264*c^6 - 42*b*c^3*log(F)))/(b^5*d^8*log(F)^5)
- (72*c*x^8*(b*log(F) - 55*c^3))/(b^5*d^5*log(F)^5) + (12*c^2*x^4*(5*b^2*lo
g(F)^2 + 330*c^6 - 84*b*c^3*log(F)))/(b^5*d^9*log(F)^5) - (288*c^2*x^7*(b*l
og(F) - 22*c^3))/(b^5*d^6*log(F)^5)))/(x^12 + c^12/d^12 + (12*c*x^11)/d + (
12*c^11*x)/d^11 + (66*c^2*x^10)/d^2 + (220*c^3*x^9)/d^3 + (495*c^4*x^8)/d^4
 + (792*c^5*x^7)/d^5 + (924*c^6*x^6)/d^6 + (792*c^7*x^5)/d^7 + (495*c^8*x^4
)/d^8 + (220*c^9*x^3)/d^9 + (66*c^10*x^2)/d^10)
```

sympy [B] time = 1.09, size = 760, normalized size = 7.92

$$\frac{F^{a+\frac{b}{(c+dx)^3}}\left(-b^4\log(F)^4+4b^3c^3\log(F)^3+12b^3c^2dx\log(F)^3+12b^3cd^2x^2\log(F)^3+4b^3d^3x^3\log(F)^3-12b^2c^6\log\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**3)/(d*x+c)**16,x)
```

```
[Out] F**(a + b/(c + d*x)**3)*(-b**4*log(F)**4 + 4*b**3*c**3*log(F)**3 + 12*b**3*
c**2*d*x*log(F)**3 + 12*b**3*c*d**2*x**2*log(F)**3 + 4*b**3*d**3*x**3*log(F
```

```
)**3 - 12*b**2*c**6*log(F)**2 - 72*b**2*c**5*d*x*log(F)**2 - 180*b**2*c**4*
d**2*x**2*log(F)**2 - 240*b**2*c**3*d**3*x**3*log(F)**2 - 180*b**2*c**2*d**
4*x**4*log(F)**2 - 72*b**2*c*d**5*x**5*log(F)**2 - 12*b**2*d**6*x**6*log(F)
**2 + 24*b*c**9*log(F) + 216*b*c**8*d*x*log(F) + 864*b*c**7*d**2*x**2*log(F
) + 2016*b*c**6*d**3*x**3*log(F) + 3024*b*c**5*d**4*x**4*log(F) + 3024*b*c*
*4*d**5*x**5*log(F) + 2016*b*c**3*d**6*x**6*log(F) + 864*b*c**2*d**7*x**7*l
og(F) + 216*b*c*d**8*x**8*log(F) + 24*b*d**9*x**9*log(F) - 24*c**12 - 288*c
**11*d*x - 1584*c**10*d**2*x**2 - 5280*c**9*d**3*x**3 - 11880*c**8*d**4*x**
4 - 19008*c**7*d**5*x**5 - 22176*c**6*d**6*x**6 - 19008*c**5*d**7*x**7 - 11
880*c**4*d**8*x**8 - 5280*c**3*d**9*x**9 - 1584*c**2*d**10*x**10 - 288*c*d*
*11*x**11 - 24*d**12*x**12)/(3*b**5*c**12*d*log(F)**5 + 36*b**5*c**11*d**2*
x*log(F)**5 + 198*b**5*c**10*d**3*x**2*log(F)**5 + 660*b**5*c**9*d**4*x**3*
log(F)**5 + 1485*b**5*c**8*d**5*x**4*log(F)**5 + 2376*b**5*c**7*d**6*x**5*l
og(F)**5 + 2772*b**5*c**6*d**7*x**6*log(F)**5 + 2376*b**5*c**5*d**8*x**7*lo
g(F)**5 + 1485*b**5*c**4*d**9*x**8*log(F)**5 + 660*b**5*c**3*d**10*x**9*log
(F)**5 + 198*b**5*c**2*d**11*x**10*log(F)**5 + 36*b**5*c*d**12*x**11*log(F)
**5 + 3*b**5*d**13*x**12*log(F)**5)
```

3.352 $\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^{19}} dx$

Optimal. Leaf size=113

$$\frac{F^{a+\frac{b}{(c+dx)^3}}\left(-b^5\log^5(F)+5b^4\log^4(F)(c+dx)^3-20b^3\log^3(F)(c+dx)^6+60b^2\log^2(F)(c+dx)^9-120b\log(F)(c+\right.}{3b^6d\log^6(F)(c+dx)^{15}}$$

```
[Out] 1/3*F^(a+b/(d*x+c)^3)*(120*(d*x+c)^15-120*b*(d*x+c)^12*ln(F)+60*b^2*(d*x+c)
^9*ln(F)^2-20*b^3*(d*x+c)^6*ln(F)^3+5*b^4*(d*x+c)^3*ln(F)^4-b^5*ln(F)^5)/b^
6/d/(d*x+c)^15/ln(F)^6
```

Rubi [C] time = 0.04, antiderivative size = 31, normalized size of antiderivative = 0.27, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2218}

$$\frac{F^a\text{Gamma}\left(6,-\frac{b\log(F)}{(c+dx)^3}\right)}{3b^6d\log^6(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^3)/(c + d*x)^19,x]
```

```
[Out] (F^a*Gamma[6, -((b*Log[F])/(c + d*x)^3)])/(3*b^6*d*Log[F]^6)
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^{19}}\,dx=\frac{F^a\Gamma\left(6,-\frac{b\log(F)}{(c+dx)^3}\right)}{3b^6d\log^6(F)}$$

Mathematica [C] time = 0.01, size = 31, normalized size = 0.27

$$\frac{F^a\Gamma\left(6,-\frac{b\log(F)}{(c+dx)^3}\right)}{3b^6d\log^6(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^3)/(c + d*x)^19,x]
```

```
[Out] (F^a*Gamma[6, -((b*Log[F])/(c + d*x)^3)])/(3*b^6*d*Log[F]^6)
```

fricas [B] time = 0.58, size = 863, normalized size = 7.64

$$\frac{\left(120\, d^{15}x^{15} + 1800\, cd^{14}x^{14} + 12600\, c^{2}d^{13}x^{13} + 54600\, c^{3}d^{12}x^{12} + 163800\, c^{4}d^{11}x^{11} + 360360\, c^{5}d^{10}x^{10} + 600600\, c^{6}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^19,x, algorithm="fricas")
```

```
[Out] 1/3*(120*d^15*x^15 + 1800*c*d^14*x^14 + 12600*c^2*d^13*x^13 + 54600*c^3*d^1
2*x^12 + 163800*c^4*d^11*x^11 + 360360*c^5*d^10*x^10 + 600600*c^6*d^9*x^9 +
 772200*c^7*d^8*x^8 + 772200*c^8*d^7*x^7 + 600600*c^9*d^6*x^6 + 360360*c^10
*d^5*x^5 + 163800*c^11*d^4*x^4 + 54600*c^12*d^3*x^3 + 12600*c^13*d^2*x^2 +
1800*c^14*d*x + 120*c^15 - b^5*log(F)^5 + 5*(b^4*d^3*x^3 + 3*b^4*c*d^2*x^2
+ 3*b^4*c^2*d*x + b^4*c^3)*log(F)^4 - 20*(b^3*d^6*x^6 + 6*b^3*c*d^5*x^5 + 1
5*b^3*c^2*d^4*x^4 + 20*b^3*c^3*d^3*x^3 + 15*b^3*c^4*d^2*x^2 + 6*b^3*c^5*d*x
 + b^3*c^6)*log(F)^3 + 60*(b^2*d^9*x^9 + 9*b^2*c*d^8*x^8 + 36*b^2*c^2*d^7*x
^7 + 84*b^2*c^3*d^6*x^6 + 126*b^2*c^4*d^5*x^5 + 126*b^2*c^5*d^4*x^4 + 84*b^
2*c^6*d^3*x^3 + 36*b^2*c^7*d^2*x^2 + 9*b^2*c^8*d*x + b^2*c^9)*log(F)^2 - 12
0*(b*d^12*x^12 + 12*b*c*d^11*x^11 + 66*b*c^2*d^10*x^10 + 220*b*c^3*d^9*x^9
+ 495*b*c^4*d^8*x^8 + 792*b*c^5*d^7*x^7 + 924*b*c^6*d^6*x^6 + 792*b*c^7*d^5
*x^5 + 495*b*c^8*d^4*x^4 + 220*b*c^9*d^3*x^3 + 66*b*c^10*d^2*x^2 + 12*b*c^1
1*d*x + b*c^12)*log(F))*F^((a*d^3*x^3 + 3*a*c*d^2*x^2 + 3*a*c^2*d*x + a*c^3
 + b)/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))/((b^6*d^16*x^15 + 15*b^6*c
*d^15*x^14 + 105*b^6*c^2*d^14*x^13 + 455*b^6*c^3*d^13*x^12 + 1365*b^6*c^4*d
^12*x^11 + 3003*b^6*c^5*d^11*x^10 + 5005*b^6*c^6*d^10*x^9 + 6435*b^6*c^7*d^
9*x^8 + 6435*b^6*c^8*d^8*x^7 + 5005*b^6*c^9*d^7*x^6 + 3003*b^6*c^10*d^6*x^5
 + 1365*b^6*c^11*d^5*x^4 + 455*b^6*c^12*d^4*x^3 + 105*b^6*c^13*d^3*x^2 + 15
*b^6*c^14*d^2*x + b^6*c^15*d)*log(F)^6)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{(dx+c)^{3}}}}{(dx+c)^{19}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^19,x, algorithm="giac")
```

[Out] integrate(F^(a + b/(d*x + c)^3)/(d*x + c)^19, x)

maple [B] time = 0.04, size = 733, normalized size = 6.49

$$-\frac{\left(-120d^{15}x^{15}-1800c\,d^{14}x^{14}-12600c^{2}d^{13}x^{13}-54600c^{3}d^{12}x^{12}+120b\,d^{12}x^{12}\ln(F)-163800c^{4}d^{11}x^{11}+1440bc\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(F^(a+1/(d*x+c)^3*b)/(d*x+c)^19,x)

[Out] -1/3*(-120*c^15-15*ln(F)^4*b^4*c^2*d*x+1440*ln(F)*b*c^11*d*x-540*ln(F)^2*b^2*c^8*d*x-15*ln(F)^4*b^4*c*d^2*x^2+1440*ln(F)*b*c*d^11*x^11+7920*ln(F)*b*c^2*d^10*x^10+26400*ln(F)*b*c^3*d^9*x^9+59400*ln(F)*b*c^4*d^8*x^8-540*ln(F)^2*b^2*c*d^8*x^8+95040*ln(F)*b*c^5*d^7*x^7-2160*ln(F)^2*b^2*c^2*d^7*x^7+110880*ln(F)*b*c^6*d^6*x^6-5040*ln(F)^2*b^2*c^3*d^6*x^6+95040*ln(F)*b*c^7*d^5*x^5-7560*ln(F)^2*b^2*c^4*d^5*x^5+59400*ln(F)*b*c^8*d^4*x^4-7560*ln(F)^2*b^2*c^5*d^4*x^4+26400*ln(F)*b*c^9*d^3*x^3-5040*ln(F)^2*b^2*c^6*d^3*x^3+7920*ln(F)*b*c^10*d^2*x^2-2160*ln(F)^2*b^2*c^7*d^2*x^2-120*d^15*x^15+b^5*ln(F)^5+20*b^3*c^6*ln(F)^3-1800*c^14*d*x-360360*c^10*d^5*x^5-163800*c^11*d^4*x^4-54600*c^12*d^3*x^3-12600*c^13*d^2*x^2-163800*c^4*d^11*x^11-360360*c^5*d^10*x^10-600600*c^6*d^9*x^9-772200*c^7*d^8*x^8-772200*c^8*d^7*x^7-600600*c^9*d^6*x^6-12600*c^2*d^13*x^13-54600*c^3*d^12*x^12-1800*c*d^14*x^14+120*ln(F)*b*d^12*x^12-60*ln(F)^2*b^2*d^9*x^9-5*ln(F)^4*b^4*d^3*x^3+120*ln(F)*b*c^12-60*ln(F)^2*b^2*c^9-5*ln(F)^4*b^4*c^3+20*b^3*d^6*x^6*ln(F)^3+400*b^3*c^3*d^3*x^3*ln(F)^3+300*b^3*c^4*d^2*x^2*ln(F)^3+120*b^3*c^5*d*x*ln(F)^3+120*b^3*c*d^5*x^5*ln(F)^3+300*b^3*c^2*d^4*x^4*ln(F)^3)/ln(F)^6/b^6/d/(d*x+c)^15*F^((a*d^3*x^3+3*a*c*d^2*x^2+3*a*c^2*d*x+a*c^3+b)/(d*x+c)^3)

maxima [B] time = 1.34, size = 1085, normalized size = 9.60

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^19,x, algorithm="maxima")

[Out] 1/3*(120*F^a*d^15*x^15 + 1800*F^a*c*d^14*x^14 + 12600*F^a*c^2*d^13*x^13 + 120*F^a*c^15 - 120*F^a*b*c^12*log(F) + 60*F^a*b^2*c^9*log(F)^2 + 120*(455*F^a*c^3*d^12 - F^a*b*d^12*log(F))*x^12 - 20*F^a*b^3*c^6*log(F)^3 + 360*(455*F^a*c^4*d^11 - 4*F^a*b*c*d^11*log(F))*x^11 + 5*F^a*b^4*c^3*log(F)^4 + 3960*(91*F^a*c^5*d^10 - 2*F^a*b*c^2*d^10*log(F))*x^10 - F^a*b^5*log(F)^5 + 60*(10010*F^a*c^6*d^9 - 440*F^a*b*c^3*d^9*log(F) + F^a*b^2*d^9*log(F)^2)*x^9 + 540*(1430*F^a*c^7*d^8 - 110*F^a*b*c^4*d^8*log(F) + F^a*b^2*c*d^8*log(F)^2)*x^8 + 1080*(715*F^a*c^8*d^7 - 88*F^a*b*c^5*d^7*log(F) + 2*F^a*b^2*c^2*d^7*log

```
(F)^2)*x^7 + 20*(30030*F^a*c^9*d^6 - 5544*F^a*b*c^6*d^6*log(F) + 252*F^a*b^
2*c^3*d^6*log(F)^2 - F^a*b^3*d^6*log(F)^3)*x^6 + 120*(3003*F^a*c^10*d^5 - 7
92*F^a*b*c^7*d^5*log(F) + 63*F^a*b^2*c^4*d^5*log(F)^2 - F^a*b^3*c*d^5*log(F
)^3)*x^5 + 60*(2730*F^a*c^11*d^4 - 990*F^a*b*c^8*d^4*log(F) + 126*F^a*b^2*c
^5*d^4*log(F)^2 - 5*F^a*b^3*c^2*d^4*log(F)^3)*x^4 + 5*(10920*F^a*c^12*d^3 -
 5280*F^a*b*c^9*d^3*log(F) + 1008*F^a*b^2*c^6*d^3*log(F)^2 - 80*F^a*b^3*c^3
*d^3*log(F)^3 + F^a*b^4*d^3*log(F)^4)*x^3 + 15*(840*F^a*c^13*d^2 - 528*F^a*
b*c^10*d^2*log(F) + 144*F^a*b^2*c^7*d^2*log(F)^2 - 20*F^a*b^3*c^4*d^2*log(F
)^3 + F^a*b^4*c*d^2*log(F)^4)*x^2 + 15*(120*F^a*c^14*d - 96*F^a*b*c^11*d*lo
g(F) + 36*F^a*b^2*c^8*d*log(F)^2 - 8*F^a*b^3*c^5*d*log(F)^3 + F^a*b^4*c^2*d
*log(F)^4)*x)*F^(b/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))/(b^6*d^16*x^1
5*log(F)^6 + 15*b^6*c*d^15*x^14*log(F)^6 + 105*b^6*c^2*d^14*x^13*log(F)^6 +
 455*b^6*c^3*d^13*x^12*log(F)^6 + 1365*b^6*c^4*d^12*x^11*log(F)^6 + 3003*b^
6*c^5*d^11*x^10*log(F)^6 + 5005*b^6*c^6*d^10*x^9*log(F)^6 + 6435*b^6*c^7*d^
9*x^8*log(F)^6 + 6435*b^6*c^8*d^8*x^7*log(F)^6 + 5005*b^6*c^9*d^7*x^6*log(F
)^6 + 3003*b^6*c^10*d^6*x^5*log(F)^6 + 1365*b^6*c^11*d^5*x^4*log(F)^6 + 455
*b^6*c^12*d^4*x^3*log(F)^6 + 105*b^6*c^13*d^3*x^2*log(F)^6 + 15*b^6*c^14*d^
2*x*log(F)^6 + b^6*c^15*d*log(F)^6)
```

mupad [B] time = 5.77, size = 854, normalized size = 7.56

$$F^a\,F^{\frac{b}{c^3+3\,c^2\,d\,x+3\,c\,d^2\,x^2+d^3\,x^3}}\,\left(\frac{40\,x^{15}}{b^6\,d\,\ln(F)^6}-\frac{b^5\,\ln(F)^5-5\,b^4\,c^3\,\ln(F)^4+20\,b^3\,c^6\,\ln(F)^3-60\,b^2\,c^9\,\ln(F)^2+120\,b\,c^{12}\,\ln(F)-120\,c^{15}}{3\,b^6\,d^{16}\,\ln(F)^6}+\frac{600\,c\,x^{14}}{b^6\,d^2\,\ln(F)^6}+\cdots\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^3)/(c + d*x)^19,x)
```

```
[Out] (F^a*F^(b/(c^3 + d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x))*((40*x^15)/(b^6*d*log(
F)^6) - (b^5*log(F)^5 - 120*c^15 + 120*b*c^12*log(F) - 5*b^4*c^3*log(F)^4 +
 20*b^3*c^6*log(F)^3 - 60*b^2*c^9*log(F)^2)/(3*b^6*d^16*log(F)^6) + (600*c*
x^14)/(b^6*d^2*log(F)^6) + (4200*c^2*x^13)/(b^6*d^3*log(F)^6) + (5*x^3*(b^4
*log(F)^4 + 10920*c^12 - 5280*b*c^9*log(F) - 80*b^3*c^3*log(F)^3 + 1008*b^2
*c^6*log(F)^2))/(3*b^6*d^13*log(F)^6) - (20*x^6*(b^3*log(F)^3 - 30030*c^9 +
 5544*b*c^6*log(F) - 252*b^2*c^3*log(F)^2))/(3*b^6*d^10*log(F)^6) + (20*x^9
*(b^2*log(F)^2 + 10010*c^6 - 440*b*c^3*log(F)))/(b^6*d^7*log(F)^6) - (40*x^
12*(b*log(F) - 455*c^3))/(b^6*d^4*log(F)^6) + (5*c^2*x*(b^4*log(F)^4 + 120*
c^12 - 96*b*c^9*log(F) - 8*b^3*c^3*log(F)^3 + 36*b^2*c^6*log(F)^2))/(b^6*d^
15*log(F)^6) + (5*c*x^2*(b^4*log(F)^4 + 840*c^12 - 528*b*c^9*log(F) - 20*b^
3*c^3*log(F)^3 + 144*b^2*c^6*log(F)^2))/(b^6*d^14*log(F)^6) - (40*c*x^5*(b^
3*log(F)^3 - 3003*c^9 + 792*b*c^6*log(F) - 63*b^2*c^3*log(F)^2))/(b^6*d^11*
log(F)^6) + (180*c*x^8*(b^2*log(F)^2 + 1430*c^6 - 110*b*c^3*log(F)))/(b^6*d
^8*log(F)^6) - (120*c*x^11*(4*b*log(F) - 455*c^3))/(b^6*d^5*log(F)^6) - (20
*c^2*x^4*(5*b^3*log(F)^3 - 2730*c^9 + 990*b*c^6*log(F) - 126*b^2*c^3*log(F)
```

```
^2))/(b^6*d^12*log(F)^6) + (360*c^2*x^7*(2*b^2*log(F)^2 + 715*c^6 - 88*b*c^
3*log(F)))/(b^6*d^9*log(F)^6) - (1320*c^2*x^10*(2*b*log(F) - 91*c^3))/(b^6*
d^6*log(F)^6)))/(x^15 + c^15/d^15 + (15*c*x^14)/d + (15*c^14*x)/d^14 + (105
*c^2*x^13)/d^2 + (455*c^3*x^12)/d^3 + (1365*c^4*x^11)/d^4 + (3003*c^5*x^10)
/d^5 + (5005*c^6*x^9)/d^6 + (6435*c^7*x^8)/d^7 + (6435*c^8*x^7)/d^8 + (5005
*c^9*x^6)/d^9 + (3003*c^10*x^5)/d^10 + (1365*c^11*x^4)/d^11 + (455*c^12*x^3
)/d^12 + (105*c^13*x^2)/d^13)
```

sympy [B] time = 3.44, size = 1096, normalized size = 9.70

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**3)/(d*x+c)**19,x)
```

```
[Out] F**(a + b/(c + d*x)**3)*(-b**5*log(F)**5 + 5*b**4*c**3*log(F)**4 + 15*b**4*
c**2*d*x*log(F)**4 + 15*b**4*c*d**2*x**2*log(F)**4 + 5*b**4*d**3*x**3*log(F
)**4 - 20*b**3*c**6*log(F)**3 - 120*b**3*c**5*d*x*log(F)**3 - 300*b**3*c**4
*d**2*x**2*log(F)**3 - 400*b**3*c**3*d**3*x**3*log(F)**3 - 300*b**3*c**2*d*
*4*x**4*log(F)**3 - 120*b**3*c*d**5*x**5*log(F)**3 - 20*b**3*d**6*x**6*log(
F)**3 + 60*b**2*c**9*log(F)**2 + 540*b**2*c**8*d*x*log(F)**2 + 2160*b**2*c*
*7*d**2*x**2*log(F)**2 + 5040*b**2*c**6*d**3*x**3*log(F)**2 + 7560*b**2*c**
5*d**4*x**4*log(F)**2 + 7560*b**2*c**4*d**5*x**5*log(F)**2 + 5040*b**2*c**3
*d**6*x**6*log(F)**2 + 2160*b**2*c**2*d**7*x**7*log(F)**2 + 540*b**2*c*d**8
*x**8*log(F)**2 + 60*b**2*d**9*x**9*log(F)**2 - 120*b*c**12*log(F) - 1440*b
*c**11*d*x*log(F) - 7920*b*c**10*d**2*x**2*log(F) - 26400*b*c**9*d**3*x**3*
log(F) - 59400*b*c**8*d**4*x**4*log(F) - 95040*b*c**7*d**5*x**5*log(F) - 11
0880*b*c**6*d**6*x**6*log(F) - 95040*b*c**5*d**7*x**7*log(F) - 59400*b*c**4
*d**8*x**8*log(F) - 26400*b*c**3*d**9*x**9*log(F) - 7920*b*c**2*d**10*x**10
*log(F) - 1440*b*c*d**11*x**11*log(F) - 120*b*d**12*x**12*log(F) + 120*c**1
5 + 1800*c**14*d*x + 12600*c**13*d**2*x**2 + 54600*c**12*d**3*x**3 + 163800
*c**11*d**4*x**4 + 360360*c**10*d**5*x**5 + 600600*c**9*d**6*x**6 + 772200*
c**8*d**7*x**7 + 772200*c**7*d**8*x**8 + 600600*c**6*d**9*x**9 + 360360*c**
5*d**10*x**10 + 163800*c**4*d**11*x**11 + 54600*c**3*d**12*x**12 + 12600*c*
*2*d**13*x**13 + 1800*c*d**14*x**14 + 120*d**15*x**15)/(3*b**6*c**15*d*log(
F)**6 + 45*b**6*c**14*d**2*x*log(F)**6 + 315*b**6*c**13*d**3*x**2*log(F)**6
 + 1365*b**6*c**12*d**4*x**3*log(F)**6 + 4095*b**6*c**11*d**5*x**4*log(F)**
6 + 9009*b**6*c**10*d**6*x**5*log(F)**6 + 15015*b**6*c**9*d**7*x**6*log(F)*
*6 + 19305*b**6*c**8*d**8*x**7*log(F)**6 + 19305*b**6*c**7*d**9*x**8*log(F)
**6 + 15015*b**6*c**6*d**10*x**9*log(F)**6 + 9009*b**6*c**5*d**11*x**10*log
(F)**6 + 4095*b**6*c**4*d**12*x**11*log(F)**6 + 1365*b**6*c**3*d**13*x**12*
log(F)**6 + 315*b**6*c**2*d**14*x**13*log(F)**6 + 45*b**6*c*d**15*x**14*log
(F)**6 + 3*b**6*d**16*x**15*log(F)**6)
```

3.353 $\int F^{a+\frac{b}{(c+dx)^3}}(c+dx)^3\,dx$

Optimal. Leaf size=49

$$\frac{F^a(c+dx)^4\left(-\frac{b\log(F)}{(c+dx)^3}\right)^{4/3}\Gamma\left(-\frac{4}{3},-\frac{b\log(F)}{(c+dx)^3}\right)}{3d}$$

```
[Out] 1/3*F^a*(d*x+c)^4*GAMMA(-4/3,-b*ln(F)/(d*x+c)^3)*(-b*ln(F)/(d*x+c)^3)^(4/3)
/d
```

Rubi [A] time = 0.05, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2218}

$$\frac{F^a(c+dx)^4\left(-\frac{b\log(F)}{(c+dx)^3}\right)^{4/3}\text{Gamma}\left(-\frac{4}{3},-\frac{b\log(F)}{(c+dx)^3}\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^3)*(c + d*x)^3,x]
```

```
[Out] (F^a*(c + d*x)^4*Gamma[-4/3, -((b*Log[F])/(c + d*x)^3)]*(-((b*Log[F])/(c +
d*x)^3))^(4/3))/(3*d)
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+\frac{b}{(c+dx)^3}}(c+dx)^3\,dx=\frac{F^a(c+dx)^4\Gamma\left(-\frac{4}{3},-\frac{b\log(F)}{(c+dx)^3}\right)\left(-\frac{b\log(F)}{(c+dx)^3}\right)^{4/3}}{3d}$$

Mathematica [A] time = 0.03, size = 49, normalized size = 1.00

$$\frac{F^a(c+dx)^4\left(-\frac{b\log(F)}{(c+dx)^3}\right)^{4/3}\Gamma\left(-\frac{4}{3},-\frac{b\log(F)}{(c+dx)^3}\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^3)*(c + d*x)^3,x]
```

```
[Out] (F^a*(c + d*x)^4*Gamma[-4/3, -((b*Log[F])/(c + d*x)^3)]*(-((b*Log[F])/(c +
d*x)^3))^(4/3))/(3*d)
```

fricas [B] time = 0.52, size = 178, normalized size = 3.63

$$-\frac{3\,F^{a}bd\left(-\frac{b\log(F)}{d^{3}}\right)^{\frac{1}{3}}\Gamma\left(\frac{2}{3},-\frac{b\log(F)}{d^{3}x^{3}+3\,cd^{2}x^{2}+3\,c^{2}dx+c^{3}}\right)\log(F)-\left(d^{4}x^{4}+4\,cd^{3}x^{3}+6\,c^{2}d^{2}x^{2}+4\,c^{3}dx+c^{4}+3\,(bdx+bc}{4\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)*(d*x+c)^3,x, algorithm="fricas")
```

```
[Out] -1/4*(3*F^a*b*d*(-b*log(F)/d^3)^(1/3)*gamma(2/3, -b*log(F)/(d^3*x^3 + 3*c*d
^2*x^2 + 3*c^2*d*x + c^3))*log(F) - (d^4*x^4 + 4*c*d^3*x^3 + 6*c^2*d^2*x^2
+ 4*c^3*d*x + c^4 + 3*(b*d*x + b*c)*log(F))*F^((a*d^3*x^3 + 3*a*c*d^2*x^2 +
 3*a*c^2*d*x + a*c^3 + b)/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3)))/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)^{3}F^{a+\frac{b}{(dx+c)^{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)*(d*x+c)^3,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^3*F^(a + b/(d*x + c)^3), x)
```

maple [F] time = 0.11, size = 0, normalized size = 0.00

$$\int (dx+c)^{3}\,F^{a+\frac{b}{(dx+c)^{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)^3*b)*(d*x+c)^3,x)
```

```
[Out] int(F^(a+1/(d*x+c)^3*b)*(d*x+c)^3,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{4}\left(F^{a}d^{3}x^{4}+4\,F^{a}cd^{2}x^{3}+6\,F^{a}c^{2}dx^{2}+\left(4\,F^{a}c^{3}+3\,F^{a}b\log(F)\right)x\right)F^{\frac{b}{d^{3}x^{3}+3\,cd^{2}x^{2}+3\,c^{2}dx+c^{3}}}+\int-\frac{3\left(F^{a}bc^{4}\log(F)-3\,F^{a}b^{2}}{4\left(d^{4}x^{4}+4\,cd^{3}x^{3}+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)*(d*x+c)^3,x, algorithm="maxima")
```

```
[Out] 1/4*(F^a*d^3*x^4 + 4*F^a*c*d^2*x^3 + 6*F^a*c^2*d*x^2 + (4*F^a*c^3 + 3*F^a*b
*log(F))*x)*F^(b/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3)) + integrate(-3/
4*(F^a*b*c^4*log(F) - 3*F^a*b^2*d*x*log(F)^2)*F^(b/(d^3*x^3 + 3*c*d^2*x^2 +
 3*c^2*d*x + c^3))/(d^4*x^4 + 4*c*d^3*x^3 + 6*c^2*d^2*x^2 + 4*c^3*d*x + c^4
), x)
```

mupad [B] time = 3.92, size = 128, normalized size = 2.61

$$\frac{F^a F^{\frac{b}{(c+d x)^3}} (c+d x)^4}{4 d}-\frac{3 F^a \Gamma\left(\frac{2}{3}\right) (c+d x)^4 \left(-\frac{b \ln(F)}{(c+d x)^3}\right)^{4/3}}{4 d}+\frac{3 F^a \Gamma\left(\frac{2}{3},-\frac{b \ln(F)}{(c+d x)^3}\right) (c+d x)^4 \left(-\frac{b \ln(F)}{(c+d x)^3}\right)^{4/3}}{4 d}+\frac{3 F^a F^{\frac{b}{(c+d x)^3}}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^3)*(c + d*x)^3,x)
```

```
[Out] (F^a*F^(b/(c + d*x)^3)*(c + d*x)^4)/(4*d) - (3*F^a*gamma(2/3)*(c + d*x)^4*(
-(b*log(F))/(c + d*x)^3)^(4/3))/(4*d) + (3*F^a*igamma(2/3, -(b*log(F))/(c +
 d*x)^3)*(c + d*x)^4*(-(b*log(F))/(c + d*x)^3)^(4/3))/(4*d) + (3*F^a*F^(b/(
c + d*x)^3)*b*log(F)*(c + d*x))/(4*d)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{(c+dx)^3}} (c+dx)^3 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**3)*(d*x+c)**3,x)
```

```
[Out] Integral(F**(a + b/(c + d*x)**3)*(c + d*x)**3, x)
```

3.354 $\int F^{a+\frac{b}{(c+dx)^3}}(c+dx)\,dx$

Optimal. Leaf size=49

$$\frac{F^a(c+dx)^2\left(-\frac{b\log(F)}{(c+dx)^3}\right)^{2/3}\Gamma\left(-\frac{2}{3},-\frac{b\log(F)}{(c+dx)^3}\right)}{3d}$$

```
[Out] 1/3*F^a*(d*x+c)^2*GAMMA(-2/3,-b*ln(F)/(d*x+c)^3)*(-b*ln(F)/(d*x+c)^3)^(2/3)
/d
```

Rubi [A] time = 0.03, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.053, Rules used = {2218}

$$\frac{F^a(c+dx)^2\left(-\frac{b\log(F)}{(c+dx)^3}\right)^{2/3}\text{Gamma}\left(-\frac{2}{3},-\frac{b\log(F)}{(c+dx)^3}\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^3)*(c + d*x),x]
```

```
[Out] (F^a*(c + d*x)^2*Gamma[-2/3, -((b*Log[F])/(c + d*x)^3)]*(-((b*Log[F])/(c +
d*x)^3))^(2/3))/(3*d)
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+\frac{b}{(c+dx)^3}}(c+dx)\,dx=\frac{F^a(c+dx)^2\Gamma\left(-\frac{2}{3},-\frac{b\log(F)}{(c+dx)^3}\right)\left(-\frac{b\log(F)}{(c+dx)^3}\right)^{2/3}}{3d}$$

Mathematica [A] time = 0.03, size = 49, normalized size = 1.00

$$\frac{F^a(c+dx)^2\left(-\frac{b\log(F)}{(c+dx)^3}\right)^{2/3}\Gamma\left(-\frac{2}{3},-\frac{b\log(F)}{(c+dx)^3}\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^3)*(c + d*x),x]
```

```
[Out] (F^a*(c + d*x)^2*Gamma[-2/3, -((b*Log[F])/(c + d*x)^3)]*(-((b*Log[F])/(c + d*x)^3))^(2/3))/(3*d)
```

fricas [B] time = 0.47, size = 142, normalized size = 2.90

$$-\frac{F^{a}d^{2}\left(-\frac{b\log(F)}{d^{3}}\right)^{\frac{2}{3}}\Gamma\left(\frac{1}{3}, -\frac{b\log(F)}{d^{3}x^{3}+3\,cd^{2}x^{2}+3\,c^{2}dx+c^{3}}\right)-\left(d^{2}x^{2}+2\,cdx+c^{2}\right)F^{\frac{ad^{3}x^{3}+3\,acd^{2}x^{2}+3\,ac^{2}dx+ac^{3}+b}{d^{3}x^{3}+3\,cd^{2}x^{2}+3\,c^{2}dx+c^{3}}}}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)*(d*x+c),x, algorithm="fricas")
```

```
[Out] -1/2*(F^a*d^2*(-b*log(F)/d^3)^(2/3)*gamma(1/3, -b*log(F)/(d^3*x^3 + 3*c*d^2
*x^2 + 3*c^2*d*x + c^3)) - (d^2*x^2 + 2*c*d*x + c^2)*F^((a*d^3*x^3 + 3*a*c*
d^2*x^2 + 3*a*c^2*d*x + a*c^3 + b)/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3
)))/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)F^{a+\frac{b}{(dx+c)^{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)*(d*x+c),x, algorithm="giac")
```

```
[Out] integrate((d*x + c)*F^(a + b/(d*x + c)^3), x)
```

maple [F] time = 0.09, size = 0, normalized size = 0.00

$$\int \left(dx+c\right)F^{a+\frac{b}{\left(dx+c\right)^{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)^3*b)*(d*x+c),x)
```

```
[Out] int(F^(a+1/(d*x+c)^3*b)*(d*x+c),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2}\left(F^{a}dx^{2}+2\,F^{a}cx\right)F^{\frac{b}{d^{3}x^{3}+3\,cd^{2}x^{2}+3\,c^{2}dx+c^{3}}}+\int\frac{3\left(F^{a}bd^{2}x^{2}\log(F)+2\,F^{a}bcdx\log(F)\right)F^{\frac{b}{d^{3}x^{3}+3\,cd^{2}x^{2}+3\,c^{2}dx+c^{3}}}}{2\left(d^{4}x^{4}+4\,cd^{3}x^{3}+6\,c^{2}d^{2}x^{2}+4\,c^{3}dx+c^{4}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)*(d*x+c),x, algorithm="maxima")
```

```
[Out] 1/2*(F^a*d*x^2 + 2*F^a*c*x)*F^(b/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))
 + integrate(3/2*(F^a*b*d^2*x^2*log(F) + 2*F^a*b*c*d*x*log(F))*F^(b/(d^3*x^
3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))/(d^4*x^4 + 4*c*d^3*x^3 + 6*c^2*d^2*x^2
+ 4*c^3*d*x + c^4), x)
```

mupad [B] time = 4.99, size = 107, normalized size = 2.18

$$\frac{F^a\,F^{\frac{b}{{\left(c+d\,x\right)}^3}}\,{\left(c+d\,x\right)}^2}{2\,d}-\frac{F^a\,\Gamma\left(\frac{1}{3},-\frac{b\,\ln\left(F\right)}{{\left(c+d\,x\right)}^3}\right)\,{\left(c+d\,x\right)}^2\,{\left(-\frac{b\,\ln\left(F\right)}{{\left(c+d\,x\right)}^3}\right)}^{2/3}}{2\,d}+\frac{\pi\,\sqrt{3}\,F^a\,{\left(c+d\,x\right)}^2\,{\left(-\frac{b\,\ln\left(F\right)}{{\left(c+d\,x\right)}^3}\right)}^{2/3}}{3\,d\,\Gamma\left(\frac{2}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^3)*(c + d*x),x)
```

```
[Out] (F^a*F^(b/(c + d*x)^3)*(c + d*x)^2)/(2*d) - (F^a*igamma(1/3, -(b*log(F))/(c
 + d*x)^3)*(c + d*x)^2*(-(b*log(F))/(c + d*x)^3)^(2/3))/(2*d) + (3^(1/2)*F^
a*pi*(c + d*x)^2*(-(b*log(F))/(c + d*x)^3)^(2/3))/(3*d*gamma(2/3))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{(c+dx)^3}}\,(c+dx)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**3)*(d*x+c),x)
```

```
[Out] Integral(F**(a + b/(c + d*x)**3)*(c + d*x), x)
```

3.355 $\int F^{a+\frac{b}{(c+dx)^3}}\,dx$

Optimal. Leaf size=47

$$\frac{F^a(c+dx)\sqrt[3]{-\frac{b\log(F)}{(c+dx)^3}}\,\Gamma\left(-\frac{1}{3},-\frac{b\log(F)}{(c+dx)^3}\right)}{3d}$$

```
[Out] 1/3*F^a*(d*x+c)*GAMMA(-1/3,-b*ln(F)/(d*x+c)^3)*(-b*ln(F)/(d*x+c)^3)^(1/3)/d
```

Rubi [A] time = 0.01, antiderivative size = 47, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2208}

$$\frac{F^a(c+dx)\sqrt[3]{-\frac{b\log(F)}{(c+dx)^3}}\,\text{Gamma}\left(-\frac{1}{3},-\frac{b\log(F)}{(c+dx)^3}\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^3),x]
```

```
[Out] (F^a*(c + d*x)*Gamma[-1/3, -((b*Log[F])/(c + d*x)^3)]*(-((b*Log[F])/(c + d*
x)^3))^(1/3))/(3*d)
```

Rule 2208

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> -Simp[(F^a
*(c + d*x)*Gamma[1/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x)^n*Log[F
]))^(1/n)), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rubi steps

$$\int F^{a+\frac{b}{(c+dx)^3}}\,dx=\frac{F^a(c+dx)\Gamma\left(-\frac{1}{3},-\frac{b\log(F)}{(c+dx)^3}\right)\sqrt[3]{-\frac{b\log(F)}{(c+dx)^3}}}{3d}$$

Mathematica [A] time = 0.01, size = 47, normalized size = 1.00

$$\frac{F^a(c+dx)\sqrt[3]{-\frac{b\log(F)}{(c+dx)^3}}\,\Gamma\left(-\frac{1}{3},-\frac{b\log(F)}{(c+dx)^3}\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^3),x]
```

```
[Out] (F^a*(c + d*x)*Gamma[-1/3, -((b*Log[F])/(c + d*x)^3)]*(-((b*Log[F])/(c + d*
x)^3))^(1/3))/(3*d)
```

fricas [B] time = 0.43, size = 129, normalized size = 2.74

$$-\frac{F^{a}d\left(-\frac{b\log(F)}{d^{3}}\right)^{\frac{1}{3}}\Gamma\left(\frac{2}{3},-\frac{b\log(F)}{d^{3}x^{3}+3\,cd^{2}x^{2}+3\,c^{2}dx+c^{3}}\right)-(dx+c)F^{\frac{ad^{3}x^{3}+3\,acd^{2}x^{2}+3\,ac^{2}dx+ac^{3}+b}{d^{3}x^{3}+3\,cd^{2}x^{2}+3\,c^{2}dx+c^{3}}}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3),x, algorithm="fricas")
```

```
[Out] -(F^a*d*(-b*log(F)/d^3)^(1/3)*gamma(2/3, -b*log(F)/(d^3*x^3 + 3*c*d^2*x^2 +
 3*c^2*d*x + c^3)) - (d*x + c)*F^((a*d^3*x^3 + 3*a*c*d^2*x^2 + 3*a*c^2*d*x
+ a*c^3 + b)/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3)))/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{(dx+c)^{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3),x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c)^3), x)
```

maple [F] time = 0.06, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{(dx+c)^{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)^3*b),x)
```

```
[Out] int(F^(a+1/(d*x+c)^3*b),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$3\,F^{a}bd\int\frac{F^{\frac{b}{d^{3}x^{3}+3\,cd^{2}x^{2}+3\,c^{2}dx+c^{3}}}x}{d^{4}x^{4}+4\,cd^{3}x^{3}+6\,c^{2}d^{2}x^{2}+4\,c^{3}dx+c^{4}}\,dx\log(F)+F^{a}F^{\frac{b}{d^{3}x^{3}+3\,cd^{2}x^{2}+3\,c^{2}dx+c^{3}}}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3),x, algorithm="maxima")
```

```
[Out] 3*F^a*b*d*integrate(F^(b/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))*x/(d^4*
x^4 + 4*c*d^3*x^3 + 6*c^2*d^2*x^2 + 4*c^3*d*x + c^4), x)*log(F) + F^a*F^(b/
(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))*x
```

mupad [B] time = 3.93, size = 71, normalized size = 1.51

$$\frac{F^a\,\left(c+d\,x\right)\,\left(F^{\frac{b}{{\left(c+d\,x\right)}^3}}-\Gamma\left(\frac{2}{3},-\frac{b\,\ln\left(F\right)}{{\left(c+d\,x\right)}^3}\right)\,{\left(-\frac{b\,\ln\left(F\right)}{{\left(c+d\,x\right)}^3}\right)}^{1/3}+\Gamma\left(\frac{2}{3}\right)\,{\left(-\frac{b\,\ln\left(F\right)}{{\left(c+d\,x\right)}^3}\right)}^{1/3}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^3),x)
```

```
[Out] (F^a*(c + d*x)*(F^(b/(c + d*x)^3) - igamma(2/3, -(b*log(F))/(c + d*x)^3)*(-
(b*log(F))/(c + d*x)^3)^(1/3) + gamma(2/3)*(-(b*log(F))/(c + d*x)^3)^(1/3))
)/d
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+\frac{b}{(c+dx)^3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**3),x)
```

```
[Out] Integral(F**(a + b/(c + d*x)**3), x)
```

3.356 $\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^2} dx$

Optimal. Leaf size=49

$$\frac{F^a \Gamma\left(\frac{1}{3}, -\frac{b \log(F)}{(c+dx)^3}\right)}{3d(c+dx)\sqrt[3]{-\frac{b \log(F)}{(c+dx)^3}}}$$

```
[Out] 1/3*F^a*GAMMA(1/3,-b*ln(F)/(d*x+c)^3)/d/(d*x+c)/(-b*ln(F)/(d*x+c)^3)^(1/3)
```

Rubi [A] time = 0.05, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2218}

$$\frac{F^a \text{Gamma}\left(\frac{1}{3}, -\frac{b \log(F)}{(c+dx)^3}\right)}{3d(c+dx)\sqrt[3]{-\frac{b \log(F)}{(c+dx)^3}}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^3)/(c + d*x)^2,x]
```

```
[Out] (F^a*Gamma[1/3, -((b*Log[F])/(c + d*x)^3)])/(3*d*(c + d*x)*(-((b*Log[F])/(c
 + d*x)^3))^(1/3))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^2} dx = \frac{F^a \Gamma\left(\frac{1}{3}, -\frac{b \log(F)}{(c+dx)^3}\right)}{3d(c+dx)\sqrt[3]{-\frac{b \log(F)}{(c+dx)^3}}}$$

Mathematica [A] time = 0.03, size = 49, normalized size = 1.00

$$\frac{F^a\Gamma\left(\frac{1}{3},-\frac{b\log(F)}{(c+dx)^3}\right)}{3d(c+dx)\sqrt[3]{-\frac{b\log(F)}{(c+dx)^3}}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^3)/(c + d*x)^2,x]
```

```
[Out] (F^a*Gamma[1/3, -((b*Log[F])/(c + d*x)^3)])/(3*d*(c + d*x)*(-((b*Log[F])/(c
 + d*x)^3))^(1/3))
```

fricas [A] time = 0.46, size = 59, normalized size = 1.20

$$-\frac{F^a d\left(-\frac{b\log(F)}{d^3}\right)^{\frac{2}{3}}\Gamma\left(\frac{1}{3},-\frac{b\log(F)}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right)}{3\,b\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^2,x, algorithm="fricas")
```

```
[Out] -1/3*F^a*d*(-b*log(F)/d^3)^(2/3)*gamma(1/3, -b*log(F)/(d^3*x^3 + 3*c*d^2*x^
2 + 3*c^2*d*x + c^3))/(b*log(F))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{(dx+c)^3}}}{(dx+c)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^2,x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c)^3)/(d*x + c)^2, x)
```

maple [F] time = 0.10, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{(dx+c)^3}}}{(dx+c)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)^3*b)/(d*x+c)^2,x)
[Out] int(F^(a+1/(d*x+c)^3*b)/(d*x+c)^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{(dx+c)^3}}}{(dx+c)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^2,x, algorithm="maxima")
[Out] integrate(F^(a + b/(d*x + c)^3)/(d*x + c)^2, x)
```

mupad [B] time = 3.55, size = 58, normalized size = 1.18

$$\frac{F^a\left(3\,\Gamma\left(\frac{2}{3}\right)\,\Gamma\left(\frac{1}{3},-\frac{b\,\ln(F)}{(c+d\,x)^3}\right)-2\,\pi\,\sqrt{3}\right)}{9\,d\,\Gamma\left(\frac{2}{3}\right)\,(c+d\,x)\,\left(-\frac{b\,\ln(F)}{(c+d\,x)^3}\right)^{1/3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^3)/(c + d*x)^2,x)
[Out] (F^a*(3*gamma(2/3)*igamma(1/3, -(b*log(F))/(c + d*x)^3) - 2*3^(1/2)*pi))/(9
*d*gamma(2/3)*(c + d*x)*(-(b*log(F))/(c + d*x)^3)^(1/3))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**3)/(d*x+c)**2,x)
[Out] Integral(F**(a + b/(c + d*x)**3)/(c + d*x)**2, x)
```

3.357 $\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^3}\,dx$

Optimal. Leaf size=49

$$\frac{F^a\Gamma\left(\frac{2}{3},-\frac{b\log(F)}{(c+dx)^3}\right)}{3d(c+dx)^2\left(-\frac{b\log(F)}{(c+dx)^3}\right)^{2/3}}$$

```
[Out] 1/3*F^a*GAMMA(2/3,-b*ln(F)/(d*x+c)^3)/d/(d*x+c)^2/(-b*ln(F)/(d*x+c)^3)^(2/3
)
```

Rubi [A] time = 0.04, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2218}

$$\frac{F^a\text{Gamma}\left(\frac{2}{3},-\frac{b\log(F)}{(c+dx)^3}\right)}{3d(c+dx)^2\left(-\frac{b\log(F)}{(c+dx)^3}\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^3)/(c + d*x)^3,x]
```

```
[Out] (F^a*Gamma[2/3, -((b*Log[F])/(c + d*x)^3)])/(3*d*(c + d*x)^2*(-((b*Log[F])/
(c + d*x)^3))^(2/3))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^3}\,dx = \frac{F^a\Gamma\left(\frac{2}{3},-\frac{b\log(F)}{(c+dx)^3}\right)}{3d(c+dx)^2\left(-\frac{b\log(F)}{(c+dx)^3}\right)^{2/3}}$$

Mathematica [A] time = 0.03, size = 49, normalized size = 1.00

$$\frac{F^a\Gamma\left(\frac{2}{3},-\frac{b\log(F)}{(c+dx)^3}\right)}{3d(c+dx)^2\left(-\frac{b\log(F)}{(c+dx)^3}\right)^{2/3}}$$

Antiderivative was successfully verified.

[In] Integrate[F^(a + b/(c + d*x)^3)/(c + d*x)^3,x]

[Out] (F^a*Gamma[2/3, -((b*Log[F])/(c + d*x)^3)])/(3*d*(c + d*x)^2*(-((b*Log[F])/(c + d*x)^3))^(2/3))

fricas [A] time = 0.44, size = 58, normalized size = 1.18

$$-\frac{F^a\left(-\frac{b\log(F)}{d^3}\right)^{\frac{1}{3}}\Gamma\left(\frac{2}{3},-\frac{b\log(F)}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right)}{3\,b\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^3,x, algorithm="fricas")

[Out] -1/3*F^a*(-b*log(F)/d^3)^(1/3)*gamma(2/3, -b*log(F)/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))/(b*log(F))

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{F^{a+\frac{b}{(dx+c)^3}}}{(dx+c)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^3,x, algorithm="giac")

[Out] integrate(F^(a + b/(d*x + c)^3)/(d*x + c)^3, x)

maple [F] time = 0.10, size = 0, normalized size = 0.00

$$\int\frac{F^{a+\frac{b}{(dx+c)^3}}}{(dx+c)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)^3*b)/(d*x+c)^3,x)
```

```
[Out] int(F^(a+1/(d*x+c)^3*b)/(d*x+c)^3,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{(dx+c)^3}}}{(dx+c)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^3,x, algorithm="maxima")
```

```
[Out] integrate(F^(a + b/(d*x + c)^3)/(d*x + c)^3, x)
```

mupad [B] time = 3.78, size = 48, normalized size = 0.98

$$-\frac{F^a\left(\Gamma\left(\frac{2}{3}\right)-\Gamma\left(\frac{2}{3},-\frac{b\,\ln(F)}{(c+d\,x)^3}\right)\right)}{3\,d\,(c+d\,x)^2\left(-\frac{b\,\ln(F)}{(c+d\,x)^3}\right)^{2/3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^3)/(c + d*x)^3,x)
```

```
[Out] -(F^a*(gamma(2/3) - igamma(2/3, -(b*log(F))/(c + d*x)^3)))/(3*d*(c + d*x)^2
*(-(b*log(F))/(c + d*x)^3)^(2/3))
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**3)/(d*x+c)**3,x)
```

```
[Out] Timed out
```

3.358 $\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^5}\,dx$

Optimal. Leaf size=49

$$\frac{F^a\Gamma\left(\frac{4}{3},-\frac{b\log(F)}{(c+dx)^3}\right)}{3d(c+dx)^4\left(-\frac{b\log(F)}{(c+dx)^3}\right)^{4/3}}$$

```
[Out] 1/3*F^a*GAMMA(4/3,-b*ln(F)/(d*x+c)^3)/d/(d*x+c)^4/(-b*ln(F)/(d*x+c)^3)^(4/3
)
```

Rubi [A] time = 0.04, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2218}

$$\frac{F^a\text{Gamma}\left(\frac{4}{3},-\frac{b\log(F)}{(c+dx)^3}\right)}{3d(c+dx)^4\left(-\frac{b\log(F)}{(c+dx)^3}\right)^{4/3}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x)^3)/(c + d*x)^5,x]
```

```
[Out] (F^a*Gamma[4/3, -((b*Log[F])/(c + d*x)^3)])/(3*d*(c + d*x)^4*(-((b*Log[F])/
(c + d*x)^3))^(4/3))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^5}\,dx=\frac{F^a\Gamma\left(\frac{4}{3},-\frac{b\log(F)}{(c+dx)^3}\right)}{3d(c+dx)^4\left(-\frac{b\log(F)}{(c+dx)^3}\right)^{4/3}}$$

Mathematica [A] time = 0.04, size = 49, normalized size = 1.00

$$\frac{F^a\Gamma\left(\frac{4}{3},-\frac{b\log(F)}{(c+dx)^3}\right)}{3d(c+dx)^4\left(-\frac{b\log(F)}{(c+dx)^3}\right)^{4/3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x)^3)/(c + d*x)^5,x]
```

```
[Out] (F^a*Gamma[4/3, -((b*Log[F])/(c + d*x)^3)])/(3*d*(c + d*x)^4*(-((b*Log[F])/
(c + d*x)^3))^(4/3))
```

fricas [B] time = 0.44, size = 155, normalized size = 3.16

$$\frac{\left(d^3x+cd^2\right)F^a\left(-\frac{b\log(F)}{d^3}\right)^{\frac{2}{3}}\Gamma\left(\frac{1}{3},-\frac{b\log(F)}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right)-3\,F^{\frac{ad^3x^3+3\,acd^2x^2+3\,ac^2dx+ac^3+b}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}}b\log(F)}{9\left(b^2d^2x+b^2cd\right)\log(F)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^5,x, algorithm="fricas")
```

```
[Out] 1/9*((d^3*x + c*d^2)*F^a*(-b*log(F)/d^3)^(2/3)*gamma(1/3, -b*log(F)/(d^3*x^
3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3)) - 3*F^((a*d^3*x^3 + 3*a*c*d^2*x^2 + 3*a
*c^2*d*x + a*c^3 + b)/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))*b*log(F))/
((b^2*d^2*x + b^2*c*d)*log(F)^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{F^{a+\frac{b}{(dx+c)^3}}}{(dx+c)^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^5,x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c)^3)/(d*x + c)^5, x)
```

maple [F] time = 0.11, size = 0, normalized size = 0.00

$$\int\frac{F^{a+\frac{b}{(dx+c)^3}}}{(dx+c)^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)^3*b)/(d*x+c)^5,x)
```

```
[Out] int(F^(a+1/(d*x+c)^3*b)/(d*x+c)^5,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{(dx+c)^3}}}{(dx+c)^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c)^3)/(d*x+c)^5,x, algorithm="maxima")
```

```
[Out] integrate(F^(a + b/(d*x + c)^3)/(d*x + c)^5, x)
```

mupad [B] time = 4.13, size = 114, normalized size = 2.33

$$\frac{F^a\,\Gamma\left(\frac{1}{3},-\frac{b\,\ln(F)}{(c+d\,x)^3}\right)}{9\,d\,(c+d\,x)^4\,\left(-\frac{b\,\ln(F)}{(c+d\,x)^3}\right)^{4/3}}-\frac{F^a\,F^{\frac{b}{(c+d\,x)^3}}}{3\,b\,d\,\ln(F)\,(c+d\,x)}-\frac{2\,\pi\,\sqrt{3}\,F^a}{27\,d\,\Gamma\left(\frac{2}{3}\right)\,(c+d\,x)^4\,\left(-\frac{b\,\ln(F)}{(c+d\,x)^3}\right)^{4/3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x)^3)/(c + d*x)^5,x)
```

```
[Out] (F^a*igamma(1/3, -(b*log(F))/(c + d*x)^3))/(9*d*(c + d*x)^4*(-(b*log(F))/(c
 + d*x)^3)^(4/3)) - (F^a*F^(b/(c + d*x)^3))/(3*b*d*log(F)*(c + d*x)) - (2*3
^(1/2)*F^a*pi)/(27*d*gamma(2/3)*(c + d*x)^4*(-(b*log(F))/(c + d*x)^3)^(4/3)
)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c)**3)/(d*x+c)**5,x)
```

```
[Out] Timed out
```

3.359 $\int F^{a+b(c+dx)^n}(c+dx)^m\,dx$

Optimal. Leaf size=61

$$-\frac{F^a(c+dx)^{m+1}\left(-b\log(F)(c+dx)^n\right)^{-\frac{m+1}{n}}\Gamma\left(\frac{m+1}{n},-b(c+dx)^n\log(F)\right)}{dn}$$

```
[Out] -F^a*(d*x+c)^(1+m)*GAMMA((1+m)/n,-b*(d*x+c)^n*ln(F))/d/n/((-b*(d*x+c)^n*ln(
F))^((1+m)/n))
```

Rubi [A] time = 0.03, antiderivative size = 61, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2218}

$$-\frac{F^a(c+dx)^{m+1}\left(-b\log(F)(c+dx)^n\right)^{-\frac{m+1}{n}}\text{Gamma}\left(\frac{m+1}{n},-b\log(F)(c+dx)^n\right)}{dn}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^n)*(c + d*x)^m,x]
```

```
[Out] -((F^a*(c + d*x)^(1 + m)*Gamma[(1 + m)/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-
(b*(c + d*x)^n*Log[F]))^((1 + m)/n)))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+b(c+dx)^n}(c+dx)^m\,dx=-\frac{F^a(c+dx)^{1+m}\Gamma\left(\frac{1+m}{n},-b(c+dx)^n\log(F)\right)\left(-b(c+dx)^n\log(F)\right)^{-\frac{1+m}{n}}}{dn}$$

Mathematica [A] time = 0.02, size = 61, normalized size = 1.00

$$-\frac{F^a(c+dx)^{m+1}\left(-b\log(F)(c+dx)^n\right)^{-\frac{m+1}{n}}\Gamma\left(\frac{m+1}{n},-b(c+dx)^n\log(F)\right)}{dn}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^n)*(c + d*x)^m,x]
```

```
[Out] -((F^a*(c + d*x)^(1 + m)*Gamma[(1 + m)/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x)^n*Log[F]))^((1 + m)/n)))
```

fricas [F] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left((dx+c)^m F^{(dx+c)^n b+a}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^m,x, algorithm="fricas")
```

```
[Out] integral((d*x + c)^m*F^((d*x + c)^n*b + a), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)^m F^{(dx+c)^n b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^m,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^m*F^((d*x + c)^n*b + a), x)
```

maple [F] time = 0.10, size = 0, normalized size = 0.00

$$\int F^{b(dx+c)^n+a} (dx+c)^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*(d*x+c)^n)*(d*x+c)^m,x)
```

```
[Out] int(F^(a+b*(d*x+c)^n)*(d*x+c)^m,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)^m F^{(dx+c)^n b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^m,x, algorithm="maxima")
```

```
[Out] integrate((d*x + c)^m*F^((d*x + c)^n*b + a), x)
```

mupad [B] time = 3.98, size = 93, normalized size = 1.52

$$\frac{F^{a+\frac{b\,(c+d\,x)^n}{2}}\,(c+d\,x)^{m+1}\,\mathrm{M}_{-\frac{\frac{m}{2}-\frac{n}{2}+\frac{1}{2}}{n},\frac{\frac{m}{2}+\frac{1}{2}}{n}}\left(b\,\ln(F)\,(c+d\,x)^n\right)}{d\,(m+1)\,\left(b\,\ln(F)\,(c+d\,x)^n\right)^{\frac{m}{2\,n}+\frac{1}{2\,n}+\frac{1}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^n)*(c + d*x)^m,x)
```

```
[Out] (F^(a + (b*(c + d*x)^n)/2)*(c + d*x)^(m + 1)*whittakerM(-(m/2 - n/2 + 1/2)/
n, (m/2 + 1/2)/n, b*log(F)*(c + d*x)^n))/(d*(m + 1)*(b*log(F)*(c + d*x)^n)^
(m/(2*n) + 1/(2*n) + 1/2))
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**n)*(d*x+c)**m,x)
```

```
[Out] Timed out
```

3.360 $\int F^{a+b(c+dx)^n}(c+dx)^3\,dx$

Optimal. Leaf size=54

$$-\frac{F^a(c+dx)^4\left(-b\log(F)(c+dx)^n\right)^{-4/n}\Gamma\left(\frac{4}{n},-b(c+dx)^n\log(F)\right)}{dn}$$

```
[Out] -F^a*(d*x+c)^4*GAMMA(4/n,-b*(d*x+c)^n*ln(F))/d/n/((-b*(d*x+c)^n*ln(F))^(4/n
))
```

Rubi [A] time = 0.04, antiderivative size = 54, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2218}

$$-\frac{F^a(c+dx)^4\left(-b\log(F)(c+dx)^n\right)^{-4/n}\text{Gamma}\left(\frac{4}{n},-b\log(F)(c+dx)^n\right)}{dn}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^n)*(c + d*x)^3,x]
```

```
[Out] -((F^a*(c + d*x)^4*Gamma[4/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x)
^n*Log[F]))^(4/n)))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+b(c+dx)^n}(c+dx)^3\,dx=-\frac{F^a(c+dx)^4\Gamma\left(\frac{4}{n},-b(c+dx)^n\log(F)\right)\left(-b(c+dx)^n\log(F)\right)^{-4/n}}{dn}$$

Mathematica [A] time = 0.02, size = 54, normalized size = 1.00

$$-\frac{F^a(c+dx)^4\left(-b\log(F)(c+dx)^n\right)^{-4/n}\Gamma\left(\frac{4}{n},-b(c+dx)^n\log(F)\right)}{dn}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^n)*(c + d*x)^3,x]
```

```
[Out] -((F^a*(c + d*x)^4*Gamma[4/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x)
^n*Log[F]))^(4/n)))
```

fricas [F] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(d^3x^3 + 3\,cd^2x^2 + 3\,c^2dx + c^3\right)F^{(dx+c)^n b+a}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^3,x, algorithm="fricas")
```

```
[Out] integral((d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3)*F^((d*x + c)^n*b + a), x
)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)^3 F^{(dx+c)^n b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^3,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^3*F^((d*x + c)^n*b + a), x)
```

maple [F] time = 0.09, size = 0, normalized size = 0.00

$$\int (dx+c)^3\,F^{b(dx+c)^n+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(b*(d*x+c)^n+a)*(d*x+c)^3,x)
```

```
[Out] int(F^(b*(d*x+c)^n+a)*(d*x+c)^3,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)^3 F^{(dx+c)^n b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^3,x, algorithm="maxima")
```

```
[Out] integrate((d*x + c)^3*F^((d*x + c)^n*b + a), x)
```

mupad [B] time = 3.86, size = 73, normalized size = 1.35

$$\frac{F^a\,e^{\frac{b\,\ln(F)\,(c+d\,x)^n}{2}}\,(c+d\,x)^4\,\mathrm{M}_{\frac{1}{2}-\frac{2}{n},\frac{2}{n}}\left(b\,\ln(F)\,(c+d\,x)^n\right)}{4\,d\,\left(b\,\ln(F)\,(c+d\,x)^n\right)^{\frac{2}{n}+\frac{1}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^n)*(c + d*x)^3,x)
```

```
[Out] (F^a*exp((b*log(F)*(c + d*x)^n)/2)*(c + d*x)^4*whittakerM(1/2 - 2/n, 2/n, b
*log(F)*(c + d*x)^n))/(4*d*(b*log(F)*(c + d*x)^n)^(2/n + 1/2))
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**n)*(d*x+c)**3,x)
```

```
[Out] Timed out
```

3.361 $\int F^{a+b(c+dx)^n}(c+dx)^2\,dx$

Optimal. Leaf size=54

$$-\frac{F^a(c+dx)^3\left(-b\log(F)(c+dx)^n\right)^{-3/n}\Gamma\left(\frac{3}{n},-b(c+dx)^n\log(F)\right)}{dn}$$

```
[Out] -F^a*(d*x+c)^3*GAMMA(3/n,-b*(d*x+c)^n*ln(F))/d/n/((-b*(d*x+c)^n*ln(F))^(3/n
))
```

Rubi [A] time = 0.04, antiderivative size = 54, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2218}

$$-\frac{F^a(c+dx)^3\left(-b\log(F)(c+dx)^n\right)^{-3/n}\text{Gamma}\left(\frac{3}{n},-b\log(F)(c+dx)^n\right)}{dn}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^n)*(c + d*x)^2,x]
```

```
[Out] -((F^a*(c + d*x)^3*Gamma[3/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x)
^n*Log[F]))^(3/n)))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+b(c+dx)^n}(c+dx)^2\,dx=-\frac{F^a(c+dx)^3\Gamma\left(\frac{3}{n},-b(c+dx)^n\log(F)\right)\left(-b(c+dx)^n\log(F)\right)^{-3/n}}{dn}$$

Mathematica [A] time = 0.02, size = 54, normalized size = 1.00

$$-\frac{F^a(c+dx)^3\left(-b\log(F)(c+dx)^n\right)^{-3/n}\Gamma\left(\frac{3}{n},-b(c+dx)^n\log(F)\right)}{dn}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^n)*(c + d*x)^2,x]
```

```
[Out] -((F^a*(c + d*x)^3*Gamma[3/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x)
^n*Log[F]))^(3/n)))
```

fricas [F] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(d^2x^2 + 2\,cdx + c^2\right)F^{(dx+c)^n b+a}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^2,x, algorithm="fricas")
```

```
[Out] integral((d^2*x^2 + 2*c*d*x + c^2)*F^((d*x + c)^n*b + a), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)^2 F^{(dx+c)^n b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^2,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^2*F^((d*x + c)^n*b + a), x)
```

maple [F] time = 0.10, size = 0, normalized size = 0.00

$$\int (dx+c)^2\, F^{b(dx+c)^n+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(b*(d*x+c)^n+a)*(d*x+c)^2,x)
```

```
[Out] int(F^(b*(d*x+c)^n+a)*(d*x+c)^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)^2 F^{(dx+c)^n b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^2,x, algorithm="maxima")
```

```
[Out] integrate((d*x + c)^2*F^((d*x + c)^n*b + a), x)
```

mupad [B] time = 3.90, size = 73, normalized size = 1.35

$$\frac{F^a\,e^{\frac{b\,\ln(F)\,(c+d\,x)^n}{2}}\,(c+d\,x)^3\,\mathrm{M}_{\frac{1}{2}-\frac{3}{2\,n},\frac{3}{2\,n}}\left(b\,\ln(F)\,(c+d\,x)^n\right)}{3\,d\left(b\,\ln(F)\,(c+d\,x)^n\right)^{\frac{3}{2\,n}+\frac{1}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^n)*(c + d*x)^2,x)
```

```
[Out] (F^a*exp((b*log(F)*(c + d*x)^n)/2)*(c + d*x)^3*whittakerM(1/2 - 3/(2*n), 3/
(2*n), b*log(F)*(c + d*x)^n))/(3*d*(b*log(F)*(c + d*x)^n)^(3/(2*n) + 1/2))
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**n)*(d*x+c)**2,x)
```

```
[Out] Timed out
```

3.362 $\int F^{a+b(c+dx)^n}(c+dx)\,dx$

Optimal. Leaf size=54

$$-\frac{F^a(c+dx)^2\left(-b\log(F)(c+dx)^n\right)^{-2/n}\Gamma\left(\frac{2}{n},-b(c+dx)^n\log(F)\right)}{dn}$$

```
[Out] -F^a*(d*x+c)^2*GAMMA(2/n,-b*(d*x+c)^n*ln(F))/d/n/((-b*(d*x+c)^n*ln(F))^(2/n
))
```

Rubi [A] time = 0.02, antiderivative size = 54, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.053, Rules used = {2218}

$$-\frac{F^a(c+dx)^2\left(-b\log(F)(c+dx)^n\right)^{-2/n}\text{Gamma}\left(\frac{2}{n},-b\log(F)(c+dx)^n\right)}{dn}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^n)*(c + d*x),x]
```

```
[Out] -((F^a*(c + d*x)^2*Gamma[2/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x)
^n*Log[F]))^(2/n)))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+b(c+dx)^n}(c+dx)\,dx=-\frac{F^a(c+dx)^2\Gamma\left(\frac{2}{n},-b(c+dx)^n\log(F)\right)\left(-b(c+dx)^n\log(F)\right)^{-2/n}}{dn}$$

Mathematica [A] time = 0.01, size = 54, normalized size = 1.00

$$-\frac{F^a(c+dx)^2\left(-b\log(F)(c+dx)^n\right)^{-2/n}\Gamma\left(\frac{2}{n},-b(c+dx)^n\log(F)\right)}{dn}$$

Antiderivative was successfully verified.

[In] Integrate[F^(a + b*(c + d*x)^n)*(c + d*x),x]

[Out] -((F^a*(c + d*x)^2*Gamma[2/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x)^n*Log[F]))^(2/n)))

fricas [F] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left((dx+c)F^{(dx+c)^n b+a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c),x, algorithm="fricas")

[Out] integral((d*x + c)*F^((d*x + c)^n*b + a), x)

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)F^{(dx+c)^n b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c),x, algorithm="giac")

[Out] integrate((d*x + c)*F^((d*x + c)^n*b + a), x)

maple [F] time = 0.08, size = 0, normalized size = 0.00

$$\int (dx+c)\,F^{b(dx+c)^n+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(F^(b*(d*x+c)^n+a)*(d*x+c),x)

[Out] int(F^(b*(d*x+c)^n+a)*(d*x+c),x)

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)F^{(dx+c)^n b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c),x, algorithm="maxima")

[Out] integrate((d*x + c)*F^((d*x + c)^n*b + a), x)

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int F^{a+b\,(c+d\,x)^n}\,(c+d\,x)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^n)*(c + d*x),x)
```

```
[Out] int(F^(a + b*(c + d*x)^n)*(c + d*x), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\begin{cases} F^{a+\frac{b}{c^2}}cx \\ F^{a+bc^n}cx \\ \int F^{a+\frac{b}{(c+dx)^2}}\,(c+dx)\,dx \\ \frac{2F^aF^{b(c+dx)^n}bc^2n(c+dx)^n\log(F)}{2dn+4d}+\frac{6F^aF^{b(c+dx)^n}bc^2(c+dx)^n\log(F)}{2dn+4d}-\frac{2F^aF^{b(c+dx)^n}bcdnx(c+dx)^n\log(F)}{2dn+4d}-\frac{F^aF^{b(c+dx)^n}bd^2nx^2(c+dx)^n\log(F)}{2dn+4d}- \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**n)*(d*x+c),x)
```

```
[Out] Piecewise((F**(a + b/c**2)*c*x, Eq(d, 0) & Eq(n, -2)), (F**(a + b*c**n)*c*x
, Eq(d, 0)), (Integral(F**(a + b/(c + d*x)**2)*(c + d*x), x), Eq(n, -2)), (
2*F**a*F**(b*(c + d*x)**n)*b*c**2*n*(c + d*x)**n*log(F)/(2*d*n + 4*d) + 6*F
**a*F**(b*(c + d*x)**n)*b*c**2*(c + d*x)**n*log(F)/(2*d*n + 4*d) - 2*F**a*F
**(b*(c + d*x)**n)*b*c*d*n*x*(c + d*x)**n*log(F)/(2*d*n + 4*d) - F**a*F**(b
*(c + d*x)**n)*b*d**2*n*x**2*(c + d*x)**n*log(F)/(2*d*n + 4*d) - 2*F**a*F**
(b*(c + d*x)**n)*c**2*n/(2*d*n + 4*d) - 4*F**a*F**(b*(c + d*x)**n)*c**2/(2*
d*n + 4*d) + 2*F**a*F**(b*(c + d*x)**n)*c*d*n*x/(2*d*n + 4*d) + 4*F**a*F**(
b*(c + d*x)**n)*c*d*x/(2*d*n + 4*d) + F**a*F**(b*(c + d*x)**n)*d**2*n*x**2/
(2*d*n + 4*d) + 2*F**a*F**(b*(c + d*x)**n)*d**2*x**2/(2*d*n + 4*d), True))
```

3.363 $\int F^{a+b(c+dx)^n}\,dx$

Optimal. Leaf size=50

$$-\frac{F^a(c+dx)\left(-b\log(F)(c+dx)^n\right)^{-1/n}\Gamma\left(\frac{1}{n},-b(c+dx)^n\log(F)\right)}{dn}$$

```
[Out] -F^a*(d*x+c)*GAMMA(1/n,-b*(d*x+c)^n*ln(F))/d/n/((-b*(d*x+c)^n*ln(F))^(1/n))
```

Rubi [A] time = 0.01, antiderivative size = 50, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2208}

$$-\frac{F^a(c+dx)\left(-b\log(F)(c+dx)^n\right)^{-1/n}\text{Gamma}\left(\frac{1}{n},-b\log(F)(c+dx)^n\right)}{dn}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^n),x]
```

```
[Out] -((F^a*(c + d*x)*Gamma[n^(-1), -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x
)^n*Log[F]))^n^(-1)))
```

Rule 2208

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> -Simp[(F^a
*(c + d*x)*Gamma[1/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x)^n*Log[F
]))^(1/n)), x] /; FreeQ[{F, a, b, c, d, n}, x] && !IntegerQ[2/n]
```

Rubi steps

$$\int F^{a+b(c+dx)^n}\,dx=-\frac{F^a(c+dx)\Gamma\left(\frac{1}{n},-b(c+dx)^n\log(F)\right)\left(-b(c+dx)^n\log(F)\right)^{-1/n}}{dn}$$

Mathematica [A] time = 0.01, size = 50, normalized size = 1.00

$$-\frac{F^a(c+dx)\left(-b\log(F)(c+dx)^n\right)^{-1/n}\Gamma\left(\frac{1}{n},-b(c+dx)^n\log(F)\right)}{dn}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^n),x]
```

```
[Out] -((F^a*(c + d*x)*Gamma[n^(-1), -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x
)^n*Log[F]))^n^(-1)))
```

fricas [F] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(F^{(dx+c)^n b+a}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n),x, algorithm="fricas")
```

```
[Out] integral(F^((d*x + c)^n*b + a), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{(dx+c)^n b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n),x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^n*b + a), x)
```

maple [F] time = 0.04, size = 0, normalized size = 0.00

$$\int F^{b(dx+c)^n+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(b*(d*x+c)^n+a),x)
```

```
[Out] int(F^(b*(d*x+c)^n+a),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{(dx+c)^n b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n),x, algorithm="maxima")
```

```
[Out] integrate(F^((d*x + c)^n*b + a), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int F^{a+b\,(c+d\,x)^n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^n),x)
```

```
[Out] int(F^(a + b*(c + d*x)^n), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\begin{cases} F^{a+\frac{b}{c}}x \\ F^{a+bc^n}x \\ \int F^{a+\frac{b}{c+dx}}\,dx \\ \frac{F^aF^{b(c+dx)^n}bcn(c+dx)^n\log(F)}{dn+d} + \frac{2F^aF^{b(c+dx)^n}bc(c+dx)^n\log(F)}{dn+d} - \frac{F^aF^{b(c+dx)^n}bdnx(c+dx)^n\log(F)}{dn+d} - \frac{F^aF^{b(c+dx)^n}cn}{dn+d} - \frac{F^aF^{b(c+dx)^n}c}{dn+d} + \frac{F^aF^{b(c+dx}}{dn+d} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**n),x)
```

```
[Out] Piecewise((F**(a + b/c)*x, Eq(d, 0) & Eq(n, -1)), (F**(a + b*c**n)*x, Eq(d,
 0)), (Integral(F**(a + b/(c + d*x)), x), Eq(n, -1)), (F**a*F**(b*(c + d*x)
**n)*b*c*n*(c + d*x)**n*log(F)/(d*n + d) + 2*F**a*F**(b*(c + d*x)**n)*b*c*(
c + d*x)**n*log(F)/(d*n + d) - F**a*F**(b*(c + d*x)**n)*b*d*n*x*(c + d*x)**
n*log(F)/(d*n + d) - F**a*F**(b*(c + d*x)**n)*c*n/(d*n + d) - F**a*F**(b*(c
 + d*x)**n)*c/(d*n + d) + F**a*F**(b*(c + d*x)**n)*d*n*x/(d*n + d) + F**a*F
**(b*(c + d*x)**n)*d*x/(d*n + d), True))
```

3.364 $\int \frac{F^{a+b(c+dx)^n}}{c+dx}\,dx$

Optimal. Leaf size=22

$$\frac{F^a\text{Ei}\left(b(c+dx)^n\log(F)\right)}{dn}$$

```
[Out] F^a*Ei(b*(d*x+c)^n*ln(F))/d/n
```

Rubi [A] time = 0.03, antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2210}

$$\frac{F^a\text{Ei}\left(b(c+dx)^n\log(F)\right)}{dn}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^n)/(c + d*x),x]
```

```
[Out] (F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(d*n)
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^n}}{c+dx}\,dx = \frac{F^a\text{Ei}\left(b(c+dx)^n\log(F)\right)}{dn}$$

Mathematica [A] time = 0.00, size = 22, normalized size = 1.00

$$\frac{F^a\text{Ei}\left(b(c+dx)^n\log(F)\right)}{dn}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^n)/(c + d*x),x]
```

```
[Out] (F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(d*n)
```

fricas [A] time = 0.42, size = 22, normalized size = 1.00

$$\frac{F^a \text{Ei}\left((dx+c)^n b \log(F)\right)}{dn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)/(d*x+c),x, algorithm="fricas")
```

```
[Out] F^a*Ei((d*x + c)^n*b*log(F))/(d*n)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^n b+a}}{dx+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)/(d*x+c),x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^n*b + a)/(d*x + c), x)
```

maple [A] time = 0.34, size = 26, normalized size = 1.18

$$-\frac{F^a \operatorname{Ei}\left(1, -b\,(dx+c)^n \ln(F)\right)}{dn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(b*(d*x+c)^n+a)/(d*x+c),x)
```

```
[Out] -1/d/n*F^a*Ei(1,-b*(d*x+c)^n*ln(F))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^n b+a}}{dx+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)/(d*x+c),x, algorithm="maxima")
```

```
[Out] integrate(F^((d*x + c)^n*b + a)/(d*x + c), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.05

$$\int \frac{F^a\,F^{b\,(c+d\,x)^n}}{c+d\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^n)/(c + d*x),x)
```

```
[Out] int((F^a*F^(b*(c + d*x)^n))/(c + d*x), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b(c+dx)^n}}{c+dx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**n)/(d*x+c),x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**n)/(c + d*x), x)
```

3.365 $\int \frac{F^{a+b(c+dx)^n}}{(c+dx)^2} \, dx$

Optimal. Leaf size=52

$$-\frac{F^a \left(-b \log(F)(c+dx)^n\right)^{\frac{1}{n}} \Gamma\left(-\frac{1}{n}, -b(c+dx)^n \log(F)\right)}{dn(c+dx)}$$

```
[Out] -F^a*GAMMA(-1/n,-b*(d*x+c)^n*ln(F))*(-b*(d*x+c)^n*ln(F))^(1/n)/d/n/(d*x+c)
```

Rubi [A] time = 0.03, antiderivative size = 52, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2218}

$$-\frac{F^a \left(-b \log(F)(c+dx)^n\right)^{\frac{1}{n}} \text{Gamma}\left(-\frac{1}{n}, -b \log(F)(c+dx)^n\right)}{dn(c+dx)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^n)/(c + d*x)^2,x]
```

```
[Out] -((F^a*Gamma[-n^(-1), -(b*(c + d*x)^n*Log[F])]*(-(b*(c + d*x)^n*Log[F]))^n^
(-1))/(d*n*(c + d*x)))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^n}}{(c+dx)^2} \, dx = -\frac{F^a \Gamma\left(-\frac{1}{n}, -b(c+dx)^n \log(F)\right) \left(-b(c+dx)^n \log(F)\right)^{\frac{1}{n}}}{dn(c+dx)}$$

Mathematica [A] time = 0.01, size = 52, normalized size = 1.00

$$-\frac{F^a \left(-b \log(F)(c+dx)^n\right)^{\frac{1}{n}} \Gamma\left(-\frac{1}{n}, -b(c+dx)^n \log(F)\right)}{dn(c+dx)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^n)/(c + d*x)^2,x]
```

```
[Out] -((F^a*Gamma[-n^(-1), -(b*(c + d*x)^n*Log[F])]*(-(b*(c + d*x)^n*Log[F]))^n^
(-1))/(d*n*(c + d*x)))
```

fricas [F] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{F^{(dx+c)^n b+a}}{d^2x^2+2\,cdx+c^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)/(d*x+c)^2,x, algorithm="fricas")
```

```
[Out] integral(F^((d*x + c)^n*b + a)/(d^2*x^2 + 2*c*d*x + c^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^n b+a}}{(dx+c)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)/(d*x+c)^2,x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^n*b + a)/(d*x + c)^2, x)
```

maple [F] time = 0.10, size = 0, normalized size = 0.00

$$\int \frac{F^{b(dx+c)^n+a}}{(dx+c)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(b*(d*x+c)^n+a)/(d*x+c)^2,x)
```

```
[Out] int(F^(b*(d*x+c)^n+a)/(d*x+c)^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^n b+a}}{(dx+c)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)/(d*x+c)^2,x, algorithm="maxima")
```

```
[Out] integrate(F^((d*x + c)^n*b + a)/(d*x + c)^2, x)
```

mupad [B] time = 3.70, size = 71, normalized size = 1.37

$$-\frac{F^a\,e^{\frac{b\,\ln(F)\,(c+d\,x)^n}{2}}\,\left(b\,\ln(F)\,(c+d\,x)^n\right)^{\frac{1}{2\,n}-\frac{1}{2}}\,\mathrm{M}_{\frac{1}{2\,n}+\frac{1}{2},-\frac{1}{2\,n}}\left(b\,\ln(F)\,(c+d\,x)^n\right)}{d\,\left(c+d\,x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^n)/(c + d*x)^2,x)
```

```
[Out] -(F^a*exp((b*log(F)*(c + d*x)^n)/2)*(b*log(F)*(c + d*x)^n)^(1/(2*n) - 1/2)*
whittakerM(1/(2*n) + 1/2, -1/(2*n), b*log(F)*(c + d*x)^n))/(d*(c + d*x))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\begin{cases} \frac{\tilde{\infty} F^{a}}{x} & \text{for}\: c = 0 \wedge d = 0 \wedge n = 1 \\ \tilde{\infty} F^{0^{n} b + a} x & \text{for}\: c = - d x \\ \frac{F^{a + b c^{n}} x}{c^{2}} & \text{for}\: d = 0 \\ \int \frac{F^{a + b \left(c + d x\right)}}{\left(c + d x\right)^{2}}\, dx & \text{for}\: n = 1 \\ \frac{F^{a} F^{b \left(c + d x\right)^{n}} b n \left(c + d x\right)^{n} \log{\left(F \right)}}{c d n - c d + d^{2} n x - d^{2} x} - \frac{F^{a} F^{b \left(c + d x\right)^{n}} n}{c d n - c d + d^{2} n x - d^{2} x} + \frac{F^{a} F^{b \left(c + d x\right)^{n}}}{c d n - c d + d^{2} n x - d^{2} x} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**n)/(d*x+c)**2,x)
```

```
[Out] Piecewise((zoo*F**a/x, Eq(c, 0) & Eq(d, 0) & Eq(n, 1)), (zoo*F**(0**n*b + a
)*x, Eq(c, -d*x)), (F**(a + b*c**n)*x/c**2, Eq(d, 0)), (Integral(F**(a + b*
(c + d*x))/(c + d*x)**2, x), Eq(n, 1)), (F**a*F**(b*(c + d*x)**n)*b*n*(c +
d*x)**n*log(F)/(c*d*n - c*d + d**2*n*x - d**2*x) - F**a*F**(b*(c + d*x)**n)
*n/(c*d*n - c*d + d**2*n*x - d**2*x) + F**a*F**(b*(c + d*x)**n)/(c*d*n - c*
d + d**2*n*x - d**2*x), True))
```

3.366 $\int \frac{F^{a+b(c+dx)^n}}{(c+dx)^3} \, dx$

Optimal. Leaf size=54

$$-\frac{F^a \left(-b \log(F)(c+dx)^n\right)^{2/n} \Gamma\left(-\frac{2}{n}, -b(c+dx)^n \log(F)\right)}{dn(c+dx)^2}$$

```
[Out] -F^a*GAMMA(-2/n,-b*(d*x+c)^n*ln(F))*(-b*(d*x+c)^n*ln(F))^(2/n)/d/n/(d*x+c)^
2
```

Rubi [A] time = 0.03, antiderivative size = 54, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2218}

$$-\frac{F^a \left(-b \log(F)(c+dx)^n\right)^{2/n} \text{Gamma}\left(-\frac{2}{n}, -b \log(F)(c+dx)^n\right)}{dn(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^n)/(c + d*x)^3,x]
```

```
[Out] -((F^a*Gamma[-2/n, -(b*(c + d*x)^n*Log[F])]*(-(b*(c + d*x)^n*Log[F]))^(2/n)
)/(d*n*(c + d*x)^2))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^n}}{(c+dx)^3} \, dx = -\frac{F^a \Gamma\left(-\frac{2}{n}, -b(c+dx)^n \log(F)\right) \left(-b(c+dx)^n \log(F)\right)^{2/n}}{dn(c+dx)^2}$$

Mathematica [A] time = 0.01, size = 54, normalized size = 1.00

$$-\frac{F^a \left(-b \log(F)(c+dx)^n\right)^{2/n} \Gamma\left(-\frac{2}{n}, -b(c+dx)^n \log(F)\right)}{dn(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^n)/(c + d*x)^3,x]
```

```
[Out] -((F^a*Gamma[-2/n, -(b*(c + d*x)^n*Log[F])]*(-(b*(c + d*x)^n*Log[F]))^(2/n)
)/(d*n*(c + d*x)^2))
```

fricas [F] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{F^{(dx+c)^n b+a}}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)/(d*x+c)^3,x, algorithm="fricas")
```

```
[Out] integral(F^((d*x + c)^n*b + a)/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3), x
)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^n b+a}}{(dx+c)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)/(d*x+c)^3,x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^n*b + a)/(d*x + c)^3, x)
```

maple [F] time = 0.10, size = 0, normalized size = 0.00

$$\int \frac{F^{b(dx+c)^n+a}}{(dx+c)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(b*(d*x+c)^n+a)/(d*x+c)^3,x)
```

```
[Out] int(F^(b*(d*x+c)^n+a)/(d*x+c)^3,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^n b+a}}{(dx+c)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)/(d*x+c)^3,x, algorithm="maxima")
```

```
[Out] integrate(F^((d*x + c)^n*b + a)/(d*x + c)^3, x)
```

mupad [B] time = 3.72, size = 67, normalized size = 1.24

$$-\frac{F^a\,\mathrm{e}^{\frac{b\,\ln(F)\,(c+d\,x)^n}{2}}\,\mathrm{M}_{\frac{1}{n}+\frac{1}{2},-\frac{1}{n}}\left(b\,\ln(F)\,(c+d\,x)^n\right)\,\left(b\,\ln(F)\,(c+d\,x)^n\right)^{\frac{1}{n}-\frac{1}{2}}}{2\,d\,(c+d\,x)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^n)/(c + d*x)^3,x)
```

```
[Out] -(F^a*exp((b*log(F)*(c + d*x)^n)/2)*whittakerM(1/n + 1/2, -1/n, b*log(F)*(c
 + d*x)^n)*(b*log(F)*(c + d*x)^n)^(1/n - 1/2))/(2*d*(c + d*x)^2)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**n)/(d*x+c)**3,x)
```

```
[Out] Timed out
```

3.367 $\int \frac{F^{a+b(c+dx)^n}}{(c+dx)^4} dx$

Optimal. Leaf size=54

$$-\frac{F^a\left(-b\log(F)(c+dx)^n\right)^{3/n}\Gamma\left(-\frac{3}{n},-b(c+dx)^n\log(F)\right)}{dn(c+dx)^3}$$

```
[Out] -F^a*GAMMA(-3/n,-b*(d*x+c)^n*ln(F))*(-b*(d*x+c)^n*ln(F))^(3/n)/d/n/(d*x+c)^
3
```

Rubi [A] time = 0.04, antiderivative size = 54, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2218}

$$-\frac{F^a\left(-b\log(F)(c+dx)^n\right)^{3/n}\text{Gamma}\left(-\frac{3}{n},-b\log(F)(c+dx)^n\right)}{dn(c+dx)^3}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^n)/(c + d*x)^4,x]
```

```
[Out] -((F^a*Gamma[-3/n, -(b*(c + d*x)^n*Log[F])]*(-(b*(c + d*x)^n*Log[F]))^(3/n)
)/(d*n*(c + d*x)^3))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^n}}{(c+dx)^4} dx = -\frac{F^a\Gamma\left(-\frac{3}{n},-b(c+dx)^n\log(F)\right)\left(-b(c+dx)^n\log(F)\right)^{3/n}}{dn(c+dx)^3}$$

Mathematica [A] time = 0.01, size = 54, normalized size = 1.00

$$-\frac{F^a\left(-b\log(F)(c+dx)^n\right)^{3/n}\Gamma\left(-\frac{3}{n},-b(c+dx)^n\log(F)\right)}{dn(c+dx)^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^n)/(c + d*x)^4,x]
```

```
[Out] -((F^a*Gamma[-3/n, -(b*(c + d*x)^n*Log[F])]*(-(b*(c + d*x)^n*Log[F]))^(3/n)
)/(d*n*(c + d*x)^3))
```

fricas [F] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{F^{(dx+c)^n b+a}}{d^4x^4 + 4\,cd^3x^3 + 6\,c^2d^2x^2 + 4\,c^3dx + c^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)/(d*x+c)^4,x, algorithm="fricas")
```

```
[Out] integral(F^((d*x + c)^n*b + a)/(d^4*x^4 + 4*c*d^3*x^3 + 6*c^2*d^2*x^2 + 4*c
^3*d*x + c^4), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^n b+a}}{(dx+c)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)/(d*x+c)^4,x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^n*b + a)/(d*x + c)^4, x)
```

maple [F] time = 0.10, size = 0, normalized size = 0.00

$$\int \frac{F^{b(dx+c)^n+a}}{(dx+c)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(b*(d*x+c)^n+a)/(d*x+c)^4,x)
```

```
[Out] int(F^(b*(d*x+c)^n+a)/(d*x+c)^4,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^n b+a}}{(dx+c)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)/(d*x+c)^4,x, algorithm="maxima")
```

```
[Out] integrate(F^((d*x + c)^n*b + a)/(d*x + c)^4, x)
```

mupad [B] time = 3.62, size = 71, normalized size = 1.31

$$-\frac{F^a\,\mathrm{e}^{\frac{b\,\ln(F)\,(c+d\,x)^n}{2}}\,\left(b\,\ln(F)\,(c+d\,x)^n\right)^{\frac{3}{2\,n}-\frac{1}{2}}\,\mathrm{M}_{\frac{3}{2\,n}+\frac{1}{2},-\frac{3}{2\,n}}\left(b\,\ln(F)\,(c+d\,x)^n\right)}{3\,d\,(c+d\,x)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^n)/(c + d*x)^4,x)
```

```
[Out] -(F^a*exp((b*log(F)*(c + d*x)^n)/2)*(b*log(F)*(c + d*x)^n)^(3/(2*n) - 1/2)*
whittakerM(3/(2*n) + 1/2, -3/(2*n), b*log(F)*(c + d*x)^n))/(3*d*(c + d*x)^3
)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**n)/(d*x+c)**4,x)
```

```
[Out] Timed out
```

3.368 $\int F^{a+b(c+dx)^n}(c+dx)^{-1+6n}\,dx$

Optimal. Leaf size=114

$$-\frac{F^{a+b(c+dx)^n}\left(-b^5\log^5(F)(c+dx)^{5n}+5b^4\log^4(F)(c+dx)^{4n}-20b^3\log^3(F)(c+dx)^{3n}+60b^2\log^2(F)(c+dx)^{2n}-\right.}{b^6dn\log^6(F)}$$

```
[Out] -F^(a+b*(d*x+c)^n)*(120-120*b*(d*x+c)^n*ln(F)+60*b^2*(d*x+c)^(2*n)*ln(F)^2-
20*b^3*(d*x+c)^(3*n)*ln(F)^3+5*b^4*(d*x+c)^(4*n)*ln(F)^4-b^5*(d*x+c)^(5*n)*
ln(F)^5)/b^6/d/n/ln(F)^6
```

Rubi [C] time = 0.04, antiderivative size = 32, normalized size of antiderivative = 0.28, number of steps used = 1, number of rules used = 1, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.040, Rules used = {2218}

$$-\frac{F^a\text{Gamma}\left(6,-b\log(F)(c+dx)^n\right)}{b^6dn\log^6(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^n)*(c + d*x)^(-1 + 6*n),x]
```

```
[Out] -((F^a*Gamma[6, -(b*(c + d*x)^n*Log[F])])/(b^6*d*n*Log[F]^6))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+b(c+dx)^n}(c+dx)^{-1+6n}\,dx=-\frac{F^a\Gamma\left(6,-b(c+dx)^n\log(F)\right)}{b^6dn\log^6(F)}$$

Mathematica [C] time = 0.01, size = 32, normalized size = 0.28

$$-\frac{F^a\Gamma\left(6,-b(c+dx)^n\log(F)\right)}{b^6dn\log^6(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^n)*(c + d*x)^(-1 + 6*n),x]
```

```
[Out] -((F^a*Gamma[6, -(b*(c + d*x)^n*Log[F])])/(b^6*d*n*Log[F]^6))
```

fricas [A] time = 0.43, size = 116, normalized size = 1.02

$$\frac{\left((dx+c)^{5\,n}b^5\log(F)^5 - 5\,(dx+c)^{4\,n}b^4\log(F)^4 + 20\,(dx+c)^{3\,n}b^3\log(F)^3 - 60\,(dx+c)^{2\,n}b^2\log(F)^2 + 120\,(dx+c)}{b^6dn\log(F)^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1+6*n),x, algorithm="fricas")
```

```
[Out] ((d*x + c)^(5*n)*b^5*log(F)^5 - 5*(d*x + c)^(4*n)*b^4*log(F)^4 + 20*(d*x +
c)^(3*n)*b^3*log(F)^3 - 60*(d*x + c)^(2*n)*b^2*log(F)^2 + 120*(d*x + c)^n*b
*log(F) - 120)*e^((d*x + c)^n*b*log(F) + a*log(F))/(b^6*d*n*log(F)^6)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)^{6\,n-1}F^{(dx+c)^n b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1+6*n),x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^(6*n - 1)*F^((d*x + c)^n*b + a), x)
```

maple [A] time = 0.02, size = 113, normalized size = 0.99

$$\frac{\left(b^5\,(dx+c)^{5n}\ln(F)^5 - 5b^4\,(dx+c)^{4n}\ln(F)^4 + 20b^3\,(dx+c)^{3n}\ln(F)^3 - 60b^2\,(dx+c)^{2n}\ln(F)^2 + 120b\,(dx+c)^n\ln(}{b^6dn\ln(F)^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(b*(d*x+c)^n+a)*(d*x+c)^(-1+6*n),x)
```

```
[Out] (((d*x+c)^n)^5*b^5*ln(F)^5-5*((d*x+c)^n)^4*b^4*ln(F)^4+20*((d*x+c)^n)^3*b^3
*ln(F)^3-60*((d*x+c)^n)^2*b^2*ln(F)^2+120*b*(d*x+c)^n*ln(F)-120)/b^6/ln(F)^
6/n/d*F^(b*(d*x+c)^n+a)
```

maxima [A] time = 1.05, size = 129, normalized size = 1.13

$$\frac{\left((dx+c)^{5\,n}F^ab^5\log(F)^5 - 5\,(dx+c)^{4\,n}F^ab^4\log(F)^4 + 20\,(dx+c)^{3\,n}F^ab^3\log(F)^3 - 60\,(dx+c)^{2\,n}F^ab^2\log(F)^2 + 12}{b^6dn\log(F)^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1+6*n),x, algorithm="maxima")
```

```
[Out] ((d*x + c)^(5*n)*F^a*b^5*log(F)^5 - 5*(d*x + c)^(4*n)*F^a*b^4*log(F)^4 + 20
*(d*x + c)^(3*n)*F^a*b^3*log(F)^3 - 60*(d*x + c)^(2*n)*F^a*b^2*log(F)^2 + 1
20*(d*x + c)^n*F^a*b*log(F) - 120*F^a)*F^((d*x + c)^n*b)/(b^6*d*n*log(F)^6)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int F^{a+b\,(c+d\,x)^n}\,{(c+d\,x)}^{6\,n-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^n)*(c + d*x)^(6*n - 1),x)
```

```
[Out] int(F^(a + b*(c + d*x)^n)*(c + d*x)^(6*n - 1), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**n)*(d*x+c)**(-1+6*n),x)
```

```
[Out] Timed out
```

3.369 $\int F^{a+b(c+dx)^n}(c+dx)^{-1+5n}\,dx$

Optimal. Leaf size=94

$$\frac{F^{a+b(c+dx)^n}\left(b^4\log^4(F)(c+dx)^{4n}-4b^3\log^3(F)(c+dx)^{3n}+12b^2\log^2(F)(c+dx)^{2n}-24b\log(F)(c+dx)^n+24\right)}{b^5dn\log^5(F)}$$

```
[Out] F^(a+b*(d*x+c)^n)*(24-24*b*(d*x+c)^n*ln(F)+12*b^2*(d*x+c)^(2*n)*ln(F)^2-4*b
^3*(d*x+c)^(3*n)*ln(F)^3+b^4*(d*x+c)^(4*n)*ln(F)^4)/b^5/d/n/ln(F)^5
```

Rubi [C] time = 0.04, antiderivative size = 31, normalized size of antiderivative = 0.33, number of steps used = 1, number of rules used = 1, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.040, Rules used = {2218}

$$\frac{F^a\text{Gamma}\left(5,-b\log(F)(c+dx)^n\right)}{b^5dn\log^5(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^n)*(c + d*x)^(-1 + 5*n),x]
```

```
[Out] (F^a*Gamma[5, -(b*(c + d*x)^n*Log[F])])/(b^5*d*n*Log[F]^5)
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+b(c+dx)^n}(c+dx)^{-1+5n}\,dx=\frac{F^a\Gamma\left(5,-b(c+dx)^n\log(F)\right)}{b^5dn\log^5(F)}$$

Mathematica [C] time = 0.01, size = 31, normalized size = 0.33

$$\frac{F^a\Gamma\left(5,-b(c+dx)^n\log(F)\right)}{b^5dn\log^5(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^n)*(c + d*x)^(-1 + 5*n),x]
```

```
[Out] (F^a*Gamma[5, -(b*(c + d*x)^n*Log[F])])/(b^5*d*n*Log[F]^5)
```

fricas [A] time = 0.41, size = 98, normalized size = 1.04

$$\frac{\left((dx+c)^{4n}b^4\log(F)^4 - 4\,(dx+c)^{3n}b^3\log(F)^3 + 12\,(dx+c)^{2n}b^2\log(F)^2 - 24\,(dx+c)^n b\log(F) + 24\right)e^{\left((dx+c)^n b\log(F) + a\log(F)\right)}}{b^5 dn\log(F)^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1+5*n),x, algorithm="fricas")
```

```
[Out] ((d*x + c)^(4*n)*b^4*log(F)^4 - 4*(d*x + c)^(3*n)*b^3*log(F)^3 + 12*(d*x +
c)^(2*n)*b^2*log(F)^2 - 24*(d*x + c)^n*b*log(F) + 24)*e^((d*x + c)^n*b*log(
F) + a*log(F))/(b^5*d*n*log(F)^5)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)^{5n-1}F^{(dx+c)^n b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1+5*n),x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^(5*n - 1)*F^((d*x + c)^n*b + a), x)
```

maple [A] time = 0.03, size = 95, normalized size = 1.01

$$\frac{\left(b^4(dx+c)^{4n}\ln(F)^4 - 4b^3(dx+c)^{3n}\ln(F)^3 + 12b^2(dx+c)^{2n}\ln(F)^2 - 24b(dx+c)^n\ln(F) + 24\right)F^{b(dx+c)^n+a}}{b^5 dn\ln(F)^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(b*(d*x+c)^n+a)*(d*x+c)^(-1+5*n),x)
```

```
[Out] (((d*x+c)^n)^4*b^4*ln(F)^4-4*((d*x+c)^n)^3*b^3*ln(F)^3+12*((d*x+c)^n)^2*b^2
*ln(F)^2-24*b*(d*x+c)^n*ln(F)+24)/b^5/ln(F)^5/n/d*F^(b*(d*x+c)^n+a)
```

maxima [A] time = 1.02, size = 108, normalized size = 1.15

$$\frac{\left((dx+c)^{4n}F^a b^4\log(F)^4 - 4\,(dx+c)^{3n}F^a b^3\log(F)^3 + 12\,(dx+c)^{2n}F^a b^2\log(F)^2 - 24\,(dx+c)^n F^a b\log(F) + 24\,F\right.}{b^5 dn\log(F)^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1+5*n),x, algorithm="maxima")
```

```
[Out] ((d*x + c)^(4*n)*F^a*b^4*log(F)^4 - 4*(d*x + c)^(3*n)*F^a*b^3*log(F)^3 + 12
*(d*x + c)^(2*n)*F^a*b^2*log(F)^2 - 24*(d*x + c)^n*F^a*b*log(F) + 24*F^a)*F
^((d*x + c)^n*b)/(b^5*d*n*log(F)^5)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int F^{a+b\,(c+d\,x)^n}\,(c+d\,x)^{5\,n-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^n)*(c + d*x)^(5*n - 1),x)
```

```
[Out] int(F^(a + b*(c + d*x)^n)*(c + d*x)^(5*n - 1), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**n)*(d*x+c)**(-1+5*n),x)
```

```
[Out] Timed out
```

3.370 $\int F^{a+b(c+dx)^n}(c+dx)^{-1+4n}\,dx$

Optimal. Leaf size=137

$$-\frac{6F^{a+b(c+dx)^n}}{b^4dn\log^4(F)}+\frac{6(c+dx)^nF^{a+b(c+dx)^n}}{b^3dn\log^3(F)}-\frac{3(c+dx)^{2n}F^{a+b(c+dx)^n}}{b^2dn\log^2(F)}+\frac{(c+dx)^{3n}F^{a+b(c+dx)^n}}{bdn\log(F)}$$

```
[Out] -6*F^(a+b*(d*x+c)^n)/b^4/d/n/ln(F)^4+6*F^(a+b*(d*x+c)^n)*(d*x+c)^n/b^3/d/n/
ln(F)^3-3*F^(a+b*(d*x+c)^n)*(d*x+c)^(2*n)/b^2/d/n/ln(F)^2+F^(a+b*(d*x+c)^n)
*(d*x+c)^(3*n)/b/d/n/ln(F)
```

Rubi [A] time = 0.17, antiderivative size = 137, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.080, Rules used = {2213, 2209}

$$\frac{6(c+dx)^nF^{a+b(c+dx)^n}}{b^3dn\log^3(F)}-\frac{3(c+dx)^{2n}F^{a+b(c+dx)^n}}{b^2dn\log^2(F)}-\frac{6F^{a+b(c+dx)^n}}{b^4dn\log^4(F)}+\frac{(c+dx)^{3n}F^{a+b(c+dx)^n}}{bdn\log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^n)*(c + d*x)^(-1 + 4*n),x]
```

```
[Out] (-6*F^(a + b*(c + d*x)^n))/(b^4*d*n*Log[F]^4) + (6*F^(a + b*(c + d*x)^n)*(c
 + d*x)^n)/(b^3*d*n*Log[F]^3) - (3*F^(a + b*(c + d*x)^n)*(c + d*x)^(2*n))/(
b^2*d*n*Log[F]^2) + (F^(a + b*(c + d*x)^n)*(c + d*x)^(3*n))/(b*d*n*Log[F])
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2213

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^Simplify[m - n]*
F^(a + b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && Integer
Q[2*Simplify[(m + 1)/n]] && LtQ[0, Simplify[(m + 1)/n], 5] &&  !RationalQ[m
] && SumSimplerQ[m, -n]
```

Rubi steps

$$\int F^{a+b(c+dx)^n}(c+dx)^{-1+4n}\,dx = \frac{F^{a+b(c+dx)^n}(c+dx)^{3n}}{bdn\log(F)} - \frac{3\int F^{a+b(c+dx)^n}(c+dx)^{-1+3n}\,dx}{b\log(F)}$$
$$= -\frac{3F^{a+b(c+dx)^n}(c+dx)^{2n}}{b^2dn\log^2(F)} + \frac{F^{a+b(c+dx)^n}(c+dx)^{3n}}{bdn\log(F)} + \frac{6\int F^{a+b(c+dx)^n}(c+dx)^{-1+2n}\,dx}{b^2\log^2(F)}$$
$$= \frac{6F^{a+b(c+dx)^n}(c+dx)^n}{b^3dn\log^3(F)} - \frac{3F^{a+b(c+dx)^n}(c+dx)^{2n}}{b^2dn\log^2(F)} + \frac{F^{a+b(c+dx)^n}(c+dx)^{3n}}{bdn\log(F)} - \frac{6\int F^{a+b}}{}$$
$$= -\frac{6F^{a+b(c+dx)^n}}{b^4dn\log^4(F)} + \frac{6F^{a+b(c+dx)^n}(c+dx)^n}{b^3dn\log^3(F)} - \frac{3F^{a+b(c+dx)^n}(c+dx)^{2n}}{b^2dn\log^2(F)} + \frac{F^{a+b(c+dx)^n}(c+}{bdn\log(F}$$

Mathematica [C] time = 0.01, size = 32, normalized size = 0.23

$$-\frac{F^a\Gamma\left(4,-b(c+dx)^n\log(F)\right)}{b^4dn\log^4(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^n)*(c + d*x)^(-1 + 4*n),x]
```

```
[Out] -((F^a*Gamma[4, -(b*(c + d*x)^n*Log[F])])/(b^4*d*n*Log[F]^4))
```

fricas [A] time = 0.42, size = 80, normalized size = 0.58

$$\frac{\left((dx+c)^{3n}b^3\log(F)^3 - 3\,(dx+c)^{2n}b^2\log(F)^2 + 6\,(dx+c)^n b\log(F) - 6\right)e^{\left((dx+c)^n b\log(F) + a\log(F)\right)}}{b^4dn\log(F)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1+4*n),x, algorithm="fricas")
```

```
[Out] ((d*x + c)^(3*n)*b^3*log(F)^3 - 3*(d*x + c)^(2*n)*b^2*log(F)^2 + 6*(d*x + c
)^n*b*log(F) - 6)*e^((d*x + c)^n*b*log(F) + a*log(F))/(b^4*d*n*log(F)^4)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)^{4n-1}F^{(dx+c)^n b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1+4*n),x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^(4*n - 1)*F^((d*x + c)^n*b + a), x)
```

maple [A] time = 0.02, size = 77, normalized size = 0.56

$$\frac{\left(b^{3} \left(dx+c\right)^{3n} \ln \left(F\right)^{3}-3 b^{2} \left(dx+c\right)^{2n} \ln \left(F\right)^{2}+6 b \left(dx+c\right)^{n} \ln \left(F\right)-6\right) F^{b \left(dx+c\right)^{n}+a}}{b^{4} d n \ln \left(F\right)^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(b*(d*x+c)^n+a)*(d*x+c)^(-1+4*n),x)
```

```
[Out] (((d*x+c)^n)^3*b^3*ln(F)^3-3*((d*x+c)^n)^2*b^2*ln(F)^2+6*b*(d*x+c)^n*ln(F)-
6)/b^4/ln(F)^4/n/d*F^(b*(d*x+c)^n+a)
```

maxima [A] time = 1.02, size = 87, normalized size = 0.64

$$\frac{\left({\left(dx+c\right)}^{3 \, n} F^{a} b^{3} \log\left(F\right)^{3} - 3 \, {\left(dx+c\right)}^{2 \, n} F^{a} b^{2} \log\left(F\right)^{2} + 6 \, {\left(dx+c\right)}^{n} F^{a} b \log\left(F\right) - 6 \, F^{a}\right)} F^{{\left(dx+c\right)}^{n} b}}{b^{4} d n \log\left(F\right)^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1+4*n),x, algorithm="maxima")
```

```
[Out] ((d*x + c)^(3*n)*F^a*b^3*log(F)^3 - 3*(d*x + c)^(2*n)*F^a*b^2*log(F)^2 + 6*
(d*x + c)^n*F^a*b*log(F) - 6*F^a)*F^((d*x + c)^n*b)/(b^4*d*n*log(F)^4)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int F^{a+b\,{\left(c+d\,x\right)}^n}\,{\left(c+d\,x\right)}^{4\,n-1} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^n)*(c + d*x)^(4*n - 1),x)
```

```
[Out] int(F^(a + b*(c + d*x)^n)*(c + d*x)^(4*n - 1), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**n)*(d*x+c)**(-1+4*n),x)
```

```
[Out] Timed out
```

3.371 $\int F^{a+b(c+dx)^n}(c+dx)^{-1+3n}\,dx$

Optimal. Leaf size=100

$$\frac{2F^{a+b(c+dx)^n}}{b^3dn\log^3(F)}-\frac{2(c+dx)^nF^{a+b(c+dx)^n}}{b^2dn\log^2(F)}+\frac{(c+dx)^{2n}F^{a+b(c+dx)^n}}{bdn\log(F)}$$

```
[Out] 2*F^(a+b*(d*x+c)^n)/b^3/d/n/ln(F)^3-2*F^(a+b*(d*x+c)^n)*(d*x+c)^n/b^2/d/n/l
n(F)^2+F^(a+b*(d*x+c)^n)*(d*x+c)^(2*n)/b/d/n/ln(F)
```

Rubi [A] time = 0.12, antiderivative size = 100, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.080, Rules used = {2213, 2209}

$$-\frac{2(c+dx)^nF^{a+b(c+dx)^n}}{b^2dn\log^2(F)}+\frac{2F^{a+b(c+dx)^n}}{b^3dn\log^3(F)}+\frac{(c+dx)^{2n}F^{a+b(c+dx)^n}}{bdn\log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^n)*(c + d*x)^(-1 + 3*n),x]
```

```
[Out] (2*F^(a + b*(c + d*x)^n))/(b^3*d*n*Log[F]^3) - (2*F^(a + b*(c + d*x)^n)*(c
+ d*x)^n)/(b^2*d*n*Log[F]^2) + (F^(a + b*(c + d*x)^n)*(c + d*x)^(2*n))/(b*d
*n*Log[F])
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2213

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^Simplify[m - n]*
F^(a + b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && Integer
Q[2*Simplify[(m + 1)/n]] && LtQ[0, Simplify[(m + 1)/n], 5] && !RationalQ[m
] && SumSimplerQ[m, -n]
```

Rubi steps

$$\int F^{a+b(c+dx)^n}(c+dx)^{-1+3n}\,dx = \frac{F^{a+b(c+dx)^n}(c+dx)^{2n}}{bdn\log(F)} - \frac{2\int F^{a+b(c+dx)^n}(c+dx)^{-1+2n}\,dx}{b\log(F)}$$
$$= -\frac{2F^{a+b(c+dx)^n}(c+dx)^n}{b^2dn\log^2(F)} + \frac{F^{a+b(c+dx)^n}(c+dx)^{2n}}{bdn\log(F)} + \frac{2\int F^{a+b(c+dx)^n}(c+dx)^{-1+n}\,dx}{b^2\log^2(F)}$$
$$= \frac{2F^{a+b(c+dx)^n}}{b^3dn\log^3(F)} - \frac{2F^{a+b(c+dx)^n}(c+dx)^n}{b^2dn\log^2(F)} + \frac{F^{a+b(c+dx)^n}(c+dx)^{2n}}{bdn\log(F)}$$

Mathematica [C] time = 0.01, size = 31, normalized size = 0.31

$$\frac{F^a\Gamma\left(3,-b(c+dx)^n\log(F)\right)}{b^3dn\log^3(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^n)*(c + d*x)^(-1 + 3*n),x]
[Out] (F^a*Gamma[3, -(b*(c + d*x)^n*Log[F])])/(b^3*d*n*Log[F]^3)
```

fricas [A] time = 0.43, size = 62, normalized size = 0.62

$$\frac{\left((dx+c)^{2n}b^2\log(F)^2 - 2\,(dx+c)^n b\log(F) + 2\right)e^{\left((dx+c)^n b\log(F)+a\log(F)\right)}}{b^3dn\log(F)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1+3*n),x, algorithm="fricas")
[Out] ((d*x + c)^(2*n)*b^2*log(F)^2 - 2*(d*x + c)^n*b*log(F) + 2)*e^((d*x + c)^n*
b*log(F) + a*log(F))/(b^3*d*n*log(F)^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)^{3n-1}F^{(dx+c)^n b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1+3*n),x, algorithm="giac")
[Out] integrate((d*x + c)^(3*n - 1)*F^((d*x + c)^n*b + a), x)
```

maple [A] time = 0.02, size = 59, normalized size = 0.59

$$\frac{\left(b^{2}\left(dx+c\right)^{2n}\ln(F)^{2}-2b\left(dx+c\right)^{n}\ln(F)+2\right)F^{b(dx+c)^{n}+a}}{b^{3}dn\ln(F)^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(b*(d*x+c)^n+a)*(d*x+c)^(-1+3*n),x)
```

```
[Out] (((d*x+c)^n)^2*b^2*ln(F)^2-2*b*(d*x+c)^n*ln(F)+2)/b^3/ln(F)^3/n/d*F^(b*(d*x
+c)^n+a)
```

maxima [A] time = 1.02, size = 66, normalized size = 0.66

$$\frac{\left((dx+c)^{2\,n}F^{a}b^{2}\log(F)^{2}-2\,(dx+c)^{n}F^{a}b\log(F)+2\,F^{a}\right)F^{(dx+c)^{n}b}}{b^{3}dn\log(F)^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1+3*n),x, algorithm="maxima")
```

```
[Out] ((d*x + c)^(2*n)*F^a*b^2*log(F)^2 - 2*(d*x + c)^n*F^a*b*log(F) + 2*F^a)*F^(
(d*x + c)^n*b)/(b^3*d*n*log(F)^3)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int F^{a+b\,(c+d\,x)^{n}}\,(c+d\,x)^{3\,n-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^n)*(c + d*x)^(3*n - 1),x)
```

```
[Out] int(F^(a + b*(c + d*x)^n)*(c + d*x)^(3*n - 1), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**n)*(d*x+c)**(-1+3*n),x)
```

```
[Out] Timed out
```

3.372 $\int F^{a+b(c+dx)^n}(c+dx)^{-1+2n}\,dx$

Optimal. Leaf size=63

$$\frac{(c+dx)^n F^{a+b(c+dx)^n}}{bdn\log(F)}-\frac{F^{a+b(c+dx)^n}}{b^2dn\log^2(F)}$$

```
[Out] -F^(a+b*(d*x+c)^n)/b^2/d/n/ln(F)^2+F^(a+b*(d*x+c)^n)*(d*x+c)^n/b/d/n/ln(F)
```

Rubi [A] time = 0.07, antiderivative size = 63, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.080, Rules used = {2213, 2209}

$$\frac{(c+dx)^n F^{a+b(c+dx)^n}}{bdn\log(F)}-\frac{F^{a+b(c+dx)^n}}{b^2dn\log^2(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^n)*(c + d*x)^(-1 + 2*n),x]
```

```
[Out] -(F^(a + b*(c + d*x)^n)/(b^2*d*n*Log[F]^2)) + (F^(a + b*(c + d*x)^n)*(c + d
*x)^n)/(b*d*n*Log[F])
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2213

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^Simplify[m - n]*
F^(a + b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && Integer
Q[2*Simplify[(m + 1)/n]] && LtQ[0, Simplify[(m + 1)/n], 5] &&  !RationalQ[m
] && SumSimplerQ[m, -n]
```

Rubi steps

$$\int F^{a+b(c+dx)^n}(c+dx)^{-1+2n}\,dx = \frac{F^{a+b(c+dx)^n}(c+dx)^n}{bdn\log(F)} - \frac{\int F^{a+b(c+dx)^n}(c+dx)^{-1+n}\,dx}{b\log(F)}$$
$$= -\frac{F^{a+b(c+dx)^n}}{b^2dn\log^2(F)} + \frac{F^{a+b(c+dx)^n}(c+dx)^n}{bdn\log(F)}$$

Mathematica [C] time = 0.01, size = 32, normalized size = 0.51

$$-\frac{F^a\Gamma\left(2,-b(c+dx)^n\log(F)\right)}{b^2dn\log^2(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^n)*(c + d*x)^(-1 + 2*n),x]
```

```
[Out] -((F^a*Gamma[2, -(b*(c + d*x)^n*Log[F])])/(b^2*d*n*Log[F]^2))
```

fricas [A] time = 0.45, size = 44, normalized size = 0.70

$$\frac{\left((dx+c)^n b\log(F)-1\right)e^{\left((dx+c)^n b\log(F)+a\log(F)\right)}}{b^2dn\log(F)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1+2*n),x, algorithm="fricas")
```

```
[Out] ((d*x + c)^n*b*log(F) - 1)*e^((d*x + c)^n*b*log(F) + a*log(F))/(b^2*d*n*log
(F)^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)^{2n-1}F^{(dx+c)^n b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1+2*n),x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^(2*n - 1)*F^((d*x + c)^n*b + a), x)
```

maple [A] time = 0.07, size = 74, normalized size = 1.17

$$\frac{e^{n\ln(dx+c)}e^{\left(b\,e^{n\ln(dx+c)}+a\right)\ln(F)}}{bdn\ln(F)} - \frac{e^{\left(b\,e^{n\ln(dx+c)}+a\right)\ln(F)}}{b^2dn\ln(F)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(b*(d*x+c)^n+a)*(d*x+c)^(-1+2*n),x)
```

```
[Out] 1/d/b/n/ln(F)*exp(n*ln(d*x+c))*exp((a+b*exp(n*ln(d*x+c)))*ln(F))-1/b^2/n/d/
ln(F)^2*exp((a+b*exp(n*ln(d*x+c)))*ln(F))
```

maxima [A] time = 1.01, size = 45, normalized size = 0.71

$$\frac{\left((dx+c)^n F^a b \log(F) - F^a\right) F^{(dx+c)^n b}}{b^2 dn \log(F)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1+2*n),x, algorithm="maxima")
```

```
[Out] ((d*x + c)^n*F^a*b*log(F) - F^a)*F^((d*x + c)^n*b)/(b^2*d*n*log(F)^2)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int F^{a+b\,(c+d\,x)^n}\,(c+d\,x)^{2\,n-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^n)*(c + d*x)^(2*n - 1),x)
```

```
[Out] int(F^(a + b*(c + d*x)^n)*(c + d*x)^(2*n - 1), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**n)*(d*x+c)**(-1+2*n),x)
```

```
[Out] Timed out
```

3.373 $\int F^{a+b(c+dx)^n}(c+dx)^{-1+n}\,dx$

Optimal. Leaf size=27

$$\frac{F^{a+b(c+dx)^n}}{bdn\log(F)}$$

```
[Out] F^(a+b*(d*x+c)^n)/b/d/n/ln(F)
```

Rubi [A] time = 0.04, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.043, Rules used = {2209}

$$\frac{F^{a+b(c+dx)^n}}{bdn\log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^n)*(c + d*x)^(-1 + n),x]
```

```
[Out] F^(a + b*(c + d*x)^n)/(b*d*n*Log[F])
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+b(c+dx)^n}(c+dx)^{-1+n}\,dx=\frac{F^{a+b(c+dx)^n}}{bdn\log(F)}$$

Mathematica [A] time = 0.01, size = 27, normalized size = 1.00

$$\frac{F^{a+b(c+dx)^n}}{bdn\log(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^n)*(c + d*x)^(-1 + n),x]
```

```
[Out] F^(a + b*(c + d*x)^n)/(b*d*n*Log[F])
```

fricas [A] time = 0.43, size = 31, normalized size = 1.15

$$\frac{e^{\left((dx+c)^n b \log(F)+a \log(F)\right)}}{bdn \log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1+n),x, algorithm="fricas")
[Out] e^((d*x + c)^n*b*log(F) + a*log(F))/(b*d*n*log(F))
```

giac [A] time = 0.30, size = 27, normalized size = 1.00

$$\frac{F^{(dx+c)^n b+a}}{bdn \log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1+n),x, algorithm="giac")
[Out] F^((d*x + c)^n*b + a)/(b*d*n*log(F))
```

maple [A] time = 0.05, size = 32, normalized size = 1.19

$$\frac{\mathrm{e}^{\left(b\,\mathrm{e}^{n \ln(dx+c)}+a\right) \ln(F)}}{bdn \ln(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(b*(d*x+c)^n+a)*(d*x+c)^(n-1),x)
[Out] 1/d/b/n/ln(F)*exp((b*exp(n*ln(d*x+c))+a)*ln(F))
```

maxima [A] time = 0.90, size = 27, normalized size = 1.00

$$\frac{F^{(dx+c)^n b+a}}{bdn \log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1+n),x, algorithm="maxima")
[Out] F^((d*x + c)^n*b + a)/(b*d*n*log(F))
```

mupad [B] time = 3.68, size = 27, normalized size = 1.00

$$\frac{F^{a+b\,(c+d\,x)^n}}{b\,d\,n\,\ln(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^n)*(c + d*x)^(n - 1),x)
```

```
[Out] F^(a + b*(c + d*x)^n)/(b*d*n*log(F))
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**n)*(d*x+c)**(-1+n),x)
```

```
[Out] Timed out
```

3.374 $\int \frac{F^{a+b(c+dx)^n}}{c+dx}\,dx$

Optimal. Leaf size=22

$$\frac{F^a\text{Ei}\left(b(c+dx)^n\log(F)\right)}{dn}$$

```
[Out] F^a*Ei(b*(d*x+c)^n*ln(F))/d/n
```

Rubi [A] time = 0.04, antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2210}

$$\frac{F^a\text{Ei}\left(b(c+dx)^n\log(F)\right)}{dn}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^n)/(c + d*x),x]
```

```
[Out] (F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(d*n)
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^n}}{c+dx}\,dx = \frac{F^a\text{Ei}\left(b(c+dx)^n\log(F)\right)}{dn}$$

Mathematica [A] time = 0.00, size = 22, normalized size = 1.00

$$\frac{F^a\text{Ei}\left(b(c+dx)^n\log(F)\right)}{dn}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^n)/(c + d*x),x]
```

```
[Out] (F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(d*n)
```

fricas [A] time = 0.44, size = 22, normalized size = 1.00

$$\frac{F^{a}\mathrm{Ei}\left((dx+c)^{n}b\log(F)\right)}{dn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)/(d*x+c),x, algorithm="fricas")
```

```
[Out] F^a*Ei((d*x + c)^n*b*log(F))/(d*n)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^{n}b+a}}{dx+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)/(d*x+c),x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^n*b + a)/(d*x + c), x)
```

maple [A] time = 0.05, size = 26, normalized size = 1.18

$$-\frac{F^{a}\,\mathrm{Ei}\left(1,-b\,(dx+c)^{n}\,\ln(F)\right)}{dn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(b*(d*x+c)^n+a)/(d*x+c),x)
```

```
[Out] -1/d/n*F^a*Ei(1,-b*(d*x+c)^n*ln(F))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^{n}b+a}}{dx+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)/(d*x+c),x, algorithm="maxima")
```

```
[Out] integrate(F^((d*x + c)^n*b + a)/(d*x + c), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.05

$$\int \frac{F^{a}\,F^{b\,(c+d\,x)^{n}}}{c+d\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^n)/(c + d*x),x)
```

```
[Out] int((F^a*F^(b*(c + d*x)^n))/(c + d*x), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b(c+dx)^n}}{c+dx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**n)/(d*x+c),x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**n)/(c + d*x), x)
```

3.375 $\int F^{a+b(c+dx)^n}(c+dx)^{-1-n}\,dx$

Optimal. Leaf size=56

$$\frac{bF^a\log(F)\operatorname{Ei}\left(b(c+dx)^n\log(F)\right)}{dn}-\frac{(c+dx)^{-n}F^{a+b(c+dx)^n}}{dn}$$

```
[Out] -F^(a+b*(d*x+c)^n)/d/n/((d*x+c)^n)+b*F^a*Ei(b*(d*x+c)^n*ln(F))*ln(F)/d/n
```

Rubi [A] time = 0.07, antiderivative size = 56, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.080, Rules used = {2215, 2210}

$$\frac{bF^a\log(F)\operatorname{Ei}\left(b(c+dx)^n\log(F)\right)}{dn}-\frac{(c+dx)^{-n}F^{a+b(c+dx)^n}}{dn}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^n)*(c + d*x)^(-1 - n),x]
```

```
[Out] -(F^(a + b*(c + d*x)^n)/(d*n*(c + d*x)^n)) + (b*F^a*ExpIntegralEi[b*(c + d*
x)^n*Log[F]]*Log[F])/(d*n)
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2215

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^Simplify[m + n]*F^(a + b*(c
 + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && IntegerQ[2*Simplif
y[(m + 1)/n]] && LtQ[-4, Simplify[(m + 1)/n], 5] &&  !RationalQ[m] && SumSi
mplerQ[m, n]
```

Rubi steps

$$\begin{aligned}\int F^{a+b(c+dx)^n}(c+dx)^{-1-n}\,dx &= -\frac{F^{a+b(c+dx)^n}(c+dx)^{-n}}{dn}+(b\log(F))\int\frac{F^{a+b(c+dx)^n}}{c+dx}\,dx\\ &= -\frac{F^{a+b(c+dx)^n}(c+dx)^{-n}}{dn}+\frac{bF^a\operatorname{Ei}\left(b(c+dx)^n\log(F)\right)\log(F)}{dn}\end{aligned}$$

Mathematica [A] time = 0.01, size = 27, normalized size = 0.48

$$\frac{bF^a \log(F)\Gamma\left(-1, -b(c+dx)^n \log(F)\right)}{dn}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^n)*(c + d*x)^(-1 - n),x]
```

```
[Out] (b*F^a*Gamma[-1, -(b*(c + d*x)^n*Log[F])]*Log[F])/(d*n)
```

fricas [A] time = 0.42, size = 62, normalized size = 1.11

$$\frac{(dx+c)^n F^a b \mathrm{Ei}\left((dx+c)^n b \log(F)\right) \log(F) - e^{\left((dx+c)^n b \log(F) + a \log(F)\right)}}{(dx+c)^n dn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1-n),x, algorithm="fricas")
```

```
[Out] ((d*x + c)^n*F^a*b*Ei((d*x + c)^n*b*log(F))*log(F) - e^((d*x + c)^n*b*log(F
) + a*log(F)))/((d*x + c)^n*d*n)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)^{-n-1} F^{(dx+c)^n b+a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1-n),x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^(-n - 1)*F^((d*x + c)^n*b + a), x)
```

maple [A] time = 0.15, size = 61, normalized size = 1.09

$$-\frac{b\,F^a\,\mathrm{Ei}\left(1, -b\,(dx+c)^n \ln(F)\right)\ln(F)}{dn} - \frac{F^a F^{b(dx+c)^n}\,(dx+c)^{-n}}{dn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(b*(d*x+c)^n+a)*(d*x+c)^(-1-n),x)
```

```
[Out] -1/n/d*F^(b*(d*x+c)^n)*F^a/((d*x+c)^n)-1/n/d*ln(F)*b*F^a*Ei(1,-b*(d*x+c)^n*
ln(F))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)^{-n-1} F^{(dx+c)^n b+a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1-n),x, algorithm="maxima")
```

```
[Out] integrate((d*x + c)^(-n - 1)*F^((d*x + c)^n*b + a), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{F^{a+b\,(c+d\,x)^n}}{(c+d\,x)^{n+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^n)/(c + d*x)^(n + 1),x)
```

```
[Out] int(F^(a + b*(c + d*x)^n)/(c + d*x)^(n + 1), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**n)*(d*x+c)**(-1-n),x)
```

```
[Out] Timed out
```

3.376 $\int F^{a+b(c+dx)^n}(c+dx)^{-1-2n}\,dx$

Optimal. Leaf size=100

$$\frac{b^2F^a\log^2(F)\text{Ei}\left(b(c+dx)^n\log(F)\right)}{2dn}-\frac{(c+dx)^{-2n}F^{a+b(c+dx)^n}}{2dn}-\frac{b\log(F)(c+dx)^{-n}F^{a+b(c+dx)^n}}{2dn}$$

```
[Out] -1/2*F^(a+b*(d*x+c)^n)/d/n/((d*x+c)^(2*n))-1/2*b*F^(a+b*(d*x+c)^n)*ln(F)/d/
n/((d*x+c)^n)+1/2*b^2*F^a*Ei(b*(d*x+c)^n*ln(F))*ln(F)^2/d/n
```

Rubi [A] time = 0.11, antiderivative size = 100, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.080, Rules used = {2215, 2210}

$$\frac{b^2F^a\log^2(F)\text{Ei}\left(b(c+dx)^n\log(F)\right)}{2dn}-\frac{(c+dx)^{-2n}F^{a+b(c+dx)^n}}{2dn}-\frac{b\log(F)(c+dx)^{-n}F^{a+b(c+dx)^n}}{2dn}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^n)*(c + d*x)^(-1 - 2*n),x]
```

```
[Out] -F^(a + b*(c + d*x)^n)/(2*d*n*(c + d*x)^(2*n)) - (b*F^(a + b*(c + d*x)^n)*L
og[F])/(2*d*n*(c + d*x)^n) + (b^2*F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]]*L
og[F]^2)/(2*d*n)
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2215

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^Simplify[m + n]*F^(a + b*(c
 + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && IntegerQ[2*Simplif
y[(m + 1)/n]] && LtQ[-4, Simplify[(m + 1)/n], 5] &&  !RationalQ[m] && SumSi
mplerQ[m, n]
```

Rubi steps

$$\int F^{a+b(c+dx)^n}(c+dx)^{-1-2n}\,dx = -\frac{F^{a+b(c+dx)^n}(c+dx)^{-2n}}{2dn} + \frac{1}{2}(b\log(F))\int F^{a+b(c+dx)^n}(c+dx)^{-1-n}\,dx$$
$$= -\frac{F^{a+b(c+dx)^n}(c+dx)^{-2n}}{2dn} - \frac{bF^{a+b(c+dx)^n}(c+dx)^{-n}\log(F)}{2dn} + \frac{1}{2}\left(b^2\log^2(F)\right)\int \frac{F^{a+b(}}{c+}$$
$$= -\frac{F^{a+b(c+dx)^n}(c+dx)^{-2n}}{2dn} - \frac{bF^{a+b(c+dx)^n}(c+dx)^{-n}\log(F)}{2dn} + \frac{b^2F^a\text{Ei}\left(b(c+dx)^n\log\right.}{2dn}$$

Mathematica [A] time = 0.01, size = 32, normalized size = 0.32

$$-\frac{b^2F^a\log^2(F)\Gamma\left(-2,-b(c+dx)^n\log(F)\right)}{dn}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^n)*(c + d*x)^(-1 - 2*n),x]
[Out] -((b^2*F^a*Gamma[-2, -(b*(c + d*x)^n*Log[F])]*Log[F]^2)/(d*n))
```

fricas [A] time = 0.43, size = 84, normalized size = 0.84

$$\frac{(dx+c)^{2n}F^ab^2\text{Ei}\left((dx+c)^nb\log(F)\right)\log(F)^2 - \left((dx+c)^nb\log(F)+1\right)e^{\left((dx+c)^nb\log(F)+a\log(F)\right)}}{2(dx+c)^{2n}dn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1-2*n),x, algorithm="fricas")
[Out] 1/2*((d*x + c)^(2*n)*F^a*b^2*Ei((d*x + c)^n*b*log(F))*log(F)^2 - ((d*x + c)
^n*b*log(F) + 1)*e^((d*x + c)^n*b*log(F) + a*log(F)))/((d*x + c)^(2*n)*d*n)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)^{-2n-1}F^{(dx+c)^nb+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1-2*n),x, algorithm="giac")
[Out] integrate((d*x + c)^(-2*n - 1)*F^((d*x + c)^n*b + a), x)
```

maple [A] time = 0.17, size = 99, normalized size = 0.99

$$-\frac{b^2F^a\,\text{Ei}\left(1,-b\,(dx+c)^n\ln(F)\right)\ln(F)^2}{2dn} - \frac{b\,F^aF^{b(dx+c)^n}\,(dx+c)^{-n}\ln(F)}{2dn} - \frac{F^aF^{b(dx+c)^n}\,(dx+c)^{-2n}}{2dn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(b*(d*x+c)^n+a)*(d*x+c)^(-1-2*n),x)
```

```
[Out] -1/2/n/d*F^(b*(d*x+c)^n)*F^a/((d*x+c)^n)^2-1/2/n/d*ln(F)*b*F^(b*(d*x+c)^n)*
F^a/((d*x+c)^n)-1/2/n/d*ln(F)^2*b^2*F^a*Ei(1,-b*(d*x+c)^n*ln(F))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)^{-2n-1}F^{(dx+c)^n b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1-2*n),x, algorithm="maxima")
```

```
[Out] integrate((d*x + c)^(-2*n - 1)*F^((d*x + c)^n*b + a), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{F^{a+b\,(c+d\,x)^n}}{(c+d\,x)^{2\,n+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^n)/(c + d*x)^(2*n + 1),x)
```

```
[Out] int(F^(a + b*(c + d*x)^n)/(c + d*x)^(2*n + 1), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**n)*(d*x+c)**(-1-2*n),x)
```

```
[Out] Timed out
```

3.377 $\int F^{a+b(c+dx)^n}(c+dx)^{-1-3n}\,dx$

Optimal. Leaf size=139

$$\frac{b^3F^a\log^3(F)\text{Ei}\left(b(c+dx)^n\log(F)\right)}{6dn}-\frac{b^2\log^2(F)(c+dx)^{-n}F^{a+b(c+dx)^n}}{6dn}-\frac{(c+dx)^{-3n}F^{a+b(c+dx)^n}}{3dn}-\frac{b\log(F)(c+dx)^{-2n}F}{6dn}$$

```
[Out] -1/3*F^(a+b*(d*x+c)^n)/d/n/((d*x+c)^(3*n))-1/6*b*F^(a+b*(d*x+c)^n)*ln(F)/d/
n/((d*x+c)^(2*n))-1/6*b^2*F^(a+b*(d*x+c)^n)*ln(F)^2/d/n/((d*x+c)^n)+1/6*b^3
*F^a*Ei(b*(d*x+c)^n*ln(F))*ln(F)^3/d/n
```

Rubi [A] time = 0.16, antiderivative size = 139, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.080, Rules used = {2215, 2210}

$$\frac{b^3F^a\log^3(F)\text{Ei}\left(b(c+dx)^n\log(F)\right)}{6dn}-\frac{b^2\log^2(F)(c+dx)^{-n}F^{a+b(c+dx)^n}}{6dn}-\frac{(c+dx)^{-3n}F^{a+b(c+dx)^n}}{3dn}-\frac{b\log(F)(c+dx)^{-2n}F}{6dn}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^n)*(c + d*x)^(-1 - 3*n),x]
```

```
[Out] -F^(a + b*(c + d*x)^n)/(3*d*n*(c + d*x)^(3*n)) - (b*F^(a + b*(c + d*x)^n)*L
og[F])/(6*d*n*(c + d*x)^(2*n)) - (b^2*F^(a + b*(c + d*x)^n)*Log[F]^2)/(6*d*
n*(c + d*x)^n) + (b^3*F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]]*Log[F]^3)/(6*
d*n)
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2215

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^Simplify[m + n]*F^(a + b*(c
 + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && IntegerQ[2*Simplif
y[(m + 1)/n]] && LtQ[-4, Simplify[(m + 1)/n], 5] &&  !RationalQ[m] && SumSi
mplerQ[m, n]
```

Rubi steps

$$\int F^{a+b(c+dx)^n}(c+dx)^{-1-3n}\,dx = -\frac{F^{a+b(c+dx)^n}(c+dx)^{-3n}}{3dn} + \frac{1}{3}(b\log(F))\int F^{a+b(c+dx)^n}(c+dx)^{-1-2n}\,dx$$
$$= -\frac{F^{a+b(c+dx)^n}(c+dx)^{-3n}}{3dn} - \frac{bF^{a+b(c+dx)^n}(c+dx)^{-2n}\log(F)}{6dn} + \frac{1}{6}\left(b^2\log^2(F)\right)\int F^{a}$$
$$= -\frac{F^{a+b(c+dx)^n}(c+dx)^{-3n}}{3dn} - \frac{bF^{a+b(c+dx)^n}(c+dx)^{-2n}\log(F)}{6dn} - \frac{b^2F^{a+b(c+dx)^n}(c+dx)}{6dn}$$
$$= -\frac{F^{a+b(c+dx)^n}(c+dx)^{-3n}}{3dn} - \frac{bF^{a+b(c+dx)^n}(c+dx)^{-2n}\log(F)}{6dn} - \frac{b^2F^{a+b(c+dx)^n}(c+dx)}{6dn}$$

Mathematica [A] time = 0.01, size = 31, normalized size = 0.22

$$\frac{b^3F^a\log^3(F)\Gamma\left(-3,-b(c+dx)^n\log(F)\right)}{dn}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^n)*(c + d*x)^(-1 - 3*n),x]
```

```
[Out] (b^3*F^a*Gamma[-3, -(b*(c + d*x)^n*Log[F])]*Log[F]^3)/(d*n)
```

fricas [A] time = 0.41, size = 101, normalized size = 0.73

$$\frac{(dx+c)^{3\,n}F^ab^3\mathrm{Ei}\left((dx+c)^nb\log(F)\right)\log(F)^3-\left((dx+c)^{2\,n}b^2\log(F)^2+(dx+c)^nb\log(F)+2\right)e^{\left((dx+c)^nb\log(F)+a\log\right.}}{6\,(dx+c)^{3\,n}dn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1-3*n),x, algorithm="fricas")
```

```
[Out] 1/6*((d*x + c)^(3*n)*F^a*b^3*Ei((d*x + c)^n*b*log(F))*log(F)^3 - ((d*x + c)
^(2*n)*b^2*log(F)^2 + (d*x + c)^n*b*log(F) + 2)*e^((d*x + c)^n*b*log(F) + a
*log(F)))/((d*x + c)^(3*n)*d*n)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)^{-3\,n-1}F^{(dx+c)^nb+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1-3*n),x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^(-3*n - 1)*F^((d*x + c)^n*b + a), x)
```

maple [A] time = 0.12, size = 137, normalized size = 0.99

$$-\frac{b^3 F^a \,\mathrm{Ei}\left(1,-b\,(dx+c)^n \ln(F)\right)\ln(F)^3}{6dn}-\frac{b^2 F^a F^{b(dx+c)^n}\,(dx+c)^{-n}\ln(F)^2}{6dn}-\frac{b\,F^a F^{b(dx+c)^n}\,(dx+c)^{-2n}\ln(F)}{6dn}-\frac{F^a F^{b(dx+c)}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(b*(d*x+c)^n+a)*(d*x+c)^(-1-3*n),x)
```

```
[Out] -1/3/n/d*F^(b*(d*x+c)^n)*F^a/((d*x+c)^n)^3-1/6/n/d*ln(F)*b*F^(b*(d*x+c)^n)*
F^a/((d*x+c)^n)^2-1/6/n/d*ln(F)^2*b^2*F^(b*(d*x+c)^n)*F^a/((d*x+c)^n)-1/6/n
/d*ln(F)^3*b^3*F^a*Ei(1,-b*(d*x+c)^n*ln(F))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)^{-3\,n-1} F^{(dx+c)^n b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1-3*n),x, algorithm="maxima")
```

```
[Out] integrate((d*x + c)^(-3*n - 1)*F^((d*x + c)^n*b + a), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{F^{a+b\,(c+d\,x)^n}}{(c+d\,x)^{3\,n+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^n)/(c + d*x)^(3*n + 1),x)
```

```
[Out] int(F^(a + b*(c + d*x)^n)/(c + d*x)^(3*n + 1), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**n)*(d*x+c)**(-1-3*n),x)
```

```
[Out] Timed out
```

3.378 $\int F^{a+b(c+dx)^n}(c+dx)^{-1-4n}\,dx$

Optimal. Leaf size=32

$$-\frac{b^4F^a\log^4(F)\Gamma\left(-4,-b(c+dx)^n\log(F)\right)}{dn}$$

```
[Out] -F^a/((d*x+c)^n)^4*Ei(5,-b*(d*x+c)^n*ln(F))/d/n
```

Rubi [A] time = 0.04, antiderivative size = 32, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.040, Rules used = {2218}

$$-\frac{b^4F^a\log^4(F)\text{Gamma}\left(-4,-b\log(F)(c+dx)^n\right)}{dn}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^n)*(c + d*x)^(-1 - 4*n),x]
```

```
[Out] -((b^4*F^a*Gamma[-4, -(b*(c + d*x)^n*Log[F])]*Log[F]^4)/(d*n))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+b(c+dx)^n}(c+dx)^{-1-4n}\,dx=-\frac{b^4F^a\Gamma\left(-4,-b(c+dx)^n\log(F)\right)\log^4(F)}{dn}$$

Mathematica [A] time = 0.01, size = 32, normalized size = 1.00

$$-\frac{b^4F^a\log^4(F)\Gamma\left(-4,-b(c+dx)^n\log(F)\right)}{dn}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^n)*(c + d*x)^(-1 - 4*n),x]
```

[Out] -((b^4*F^a*Gamma[-4, -(b*(c + d*x)^n*Log[F])]*Log[F]^4)/(d*n))

fricas [B] time = 0.42, size = 119, normalized size = 3.72

$$\frac{(dx+c)^{4n}F^a b^4 \mathrm{Ei}\left((dx+c)^n b\log(F)\right)\log(F)^4 - \left((dx+c)^{3n}b^3\log(F)^3 + (dx+c)^{2n}b^2\log(F)^2 + 2\,(dx+c)^n b\log(F$$
$$24\,(dx+c)^{4n}dn$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1-4*n),x, algorithm="fricas")
```

```
[Out] 1/24*((d*x + c)^(4*n)*F^a*b^4*Ei((d*x + c)^n*b*log(F))*log(F)^4 - ((d*x + c
)^(3*n)*b^3*log(F)^3 + (d*x + c)^(2*n)*b^2*log(F)^2 + 2*(d*x + c)^n*b*log(F
) + 6)*e^((d*x + c)^n*b*log(F) + a*log(F)))/((d*x + c)^(4*n)*d*n)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)^{-4n-1}F^{(dx+c)^n b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1-4*n),x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^(-4*n - 1)*F^((d*x + c)^n*b + a), x)
```

maple [B] time = 0.12, size = 175, normalized size = 5.47

$$-\frac{b^4F^a\,\mathrm{Ei}\left(1,-b\,(dx+c)^n\ln(F)\right)\ln(F)^4}{24dn}-\frac{b^3F^aF^{b(dx+c)^n}\,(dx+c)^{-n}\ln(F)^3}{24dn}-\frac{b^2F^aF^{b(dx+c)^n}\,(dx+c)^{-2n}\ln(F)^2}{24dn}-\frac{b\,F^aF^{b(d}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(b*(d*x+c)^n+a)*(d*x+c)^(-1-4*n),x)
```

```
[Out] -1/4/n/d*F^(b*(d*x+c)^n)*F^a/((d*x+c)^n)^4-1/12/n/d*ln(F)*b*F^(b*(d*x+c)^n)
*F^a/((d*x+c)^n)^3-1/24/n/d*ln(F)^2*b^2*F^(b*(d*x+c)^n)*F^a/((d*x+c)^n)^2-1
/24/n/d*ln(F)^3*b^3*F^(b*(d*x+c)^n)*F^a/((d*x+c)^n)-1/24/n/d*ln(F)^4*b^4*F^
a*Ei(1,-b*(d*x+c)^n*ln(F))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)^{-4n-1}F^{(dx+c)^n b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1-4*n),x, algorithm="maxima")
```

```
[Out] integrate((d*x + c)^(-4*n - 1)*F^((d*x + c)^n*b + a), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{F^{a+b\,(c+d\,x)^n}}{(c+d\,x)^{4\,n+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^n)/(c + d*x)^(4*n + 1),x)
[Out] int(F^(a + b*(c + d*x)^n)/(c + d*x)^(4*n + 1), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**n)*(d*x+c)**(-1-4*n),x)
[Out] Timed out
```

3.379 $\int F^{a+b(c+dx)^n}(c+dx)^{-1-5n}\,dx$

Optimal. Leaf size=31

$$\frac{b^5F^a\log^5(F)\Gamma\left(-5,-b(c+dx)^n\log(F)\right)}{dn}$$

```
[Out] -F^a/((d*x+c)^n)^5*Ei(6,-b*(d*x+c)^n*ln(F))/d/n
```

Rubi [A] time = 0.04, antiderivative size = 31, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.040, Rules used = {2218}

$$\frac{b^5F^a\log^5(F)\text{Gamma}\left(-5,-b\log(F)(c+dx)^n\right)}{dn}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^n)*(c + d*x)^(-1 - 5*n),x]
```

```
[Out] (b^5*F^a*Gamma[-5, -(b*(c + d*x)^n*Log[F])]*Log[F]^5)/(d*n)
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int F^{a+b(c+dx)^n}(c+dx)^{-1-5n}\,dx=\frac{b^5F^a\Gamma\left(-5,-b(c+dx)^n\log(F)\right)\log^5(F)}{dn}$$

Mathematica [A] time = 0.01, size = 31, normalized size = 1.00

$$\frac{b^5F^a\log^5(F)\Gamma\left(-5,-b(c+dx)^n\log(F)\right)}{dn}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^n)*(c + d*x)^(-1 - 5*n),x]
```

```
[Out] (b^5*F^a*Gamma[-5, -(b*(c + d*x)^n*Log[F])]*Log[F]^5)/(d*n)
```

fricas [B] time = 0.42, size = 137, normalized size = 4.42

$$\frac{(dx+c)^{5n}F^a b^5 \mathrm{Ei}\left((dx+c)^n b\log(F)\right)\log(F)^5 - \left((dx+c)^{4n}b^4\log(F)^4 + (dx+c)^{3n}b^3\log(F)^3 + 2\,(dx+c)^{2n}b^2\log(F)^2 \ldots}{120\,(dx+c)^{5n}dn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1-5*n),x, algorithm="fricas")
```

```
[Out] 1/120*((d*x + c)^(5*n)*F^a*b^5*Ei((d*x + c)^n*b*log(F))*log(F)^5 - ((d*x +
c)^(4*n)*b^4*log(F)^4 + (d*x + c)^(3*n)*b^3*log(F)^3 + 2*(d*x + c)^(2*n)*b^
2*log(F)^2 + 6*(d*x + c)^n*b*log(F) + 24)*e^((d*x + c)^n*b*log(F) + a*log(F
)))/((d*x + c)^(5*n)*d*n)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)^{-5n-1}F^{(dx+c)^n b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1-5*n),x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^(-5*n - 1)*F^((d*x + c)^n*b + a), x)
```

maple [B] time = 0.12, size = 213, normalized size = 6.87

$$-\frac{b^5F^a\,\mathrm{Ei}\left(1,-b\,(dx+c)^n\ln(F)\right)\ln(F)^5}{120dn}-\frac{b^4F^aF^{b(dx+c)^n}\,(dx+c)^{-n}\ln(F)^4}{120dn}-\frac{b^3F^aF^{b(dx+c)^n}\,(dx+c)^{-2n}\ln(F)^3}{120dn}-\frac{b^2F^aF^{b \ldots}}{\ldots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(b*(d*x+c)^n+a)*(d*x+c)^(-1-5*n),x)
```

```
[Out] -1/5/n/d*F^(b*(d*x+c)^n)*F^a/((d*x+c)^n)^5-1/20/n/d*ln(F)*b*F^(b*(d*x+c)^n)
*F^a/((d*x+c)^n)^4-1/60/n/d*ln(F)^2*b^2*F^(b*(d*x+c)^n)*F^a/((d*x+c)^n)^3-1
/120/n/d*ln(F)^3*b^3*F^(b*(d*x+c)^n)*F^a/((d*x+c)^n)^2-1/120/n/d*ln(F)^4*b^
4*F^(b*(d*x+c)^n)*F^a/((d*x+c)^n)-1/120/n/d*ln(F)^5*b^5*F^a*Ei(1,-b*(d*x+c)
^n*ln(F))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx+c)^{-5n-1}F^{(dx+c)^n b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^n)*(d*x+c)^(-1-5*n),x, algorithm="maxima")
```

```
[Out] integrate((d*x + c)^(-5*n - 1)*F^((d*x + c)^n*b + a), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{F^{a+b\,(c+d\,x)^n}}{(c+d\,x)^{5\,n+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^n)/(c + d*x)^(5*n + 1),x)
```

```
[Out] int(F^(a + b*(c + d*x)^n)/(c + d*x)^(5*n + 1), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**n)*(d*x+c)**(-1-5*n),x)
```

```
[Out] Timed out
```

3.380 $\int F^{c(a+bx)^n}(a+bx)^{-1+\frac{n}{2}}\,dx$

Optimal. Leaf size=47

$$\frac{\sqrt{\pi}\,\text{erfi}\left(\sqrt{c}\,\sqrt{\log(F)}\,(a+bx)^{n/2}\right)}{b\sqrt{c}\,n\sqrt{\log(F)}}$$

```
[Out] erfi((b*x+a)^(1/2*n)*c^(1/2)*ln(F)^(1/2))*Pi^(1/2)/b/n/c^(1/2)/ln(F)^(1/2)
```

Rubi [A] time = 0.07, antiderivative size = 47, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.080, Rules used = {2211, 2204}

$$\frac{\sqrt{\pi}\,\text{Erfi}\left(\sqrt{c}\,\sqrt{\log(F)}\,(a+bx)^{n/2}\right)}{b\sqrt{c}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(c*(a + b*x)^n)*(a + b*x)^(-1 + n/2),x]
```

```
[Out] (Sqrt[Pi]*Erfi[Sqrt[c]*(a + b*x)^(n/2)*Sqrt[Log[F]]])/(b*Sqrt[c]*n*Sqrt[Log
[F]])
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2211

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rubi steps

$$\begin{aligned}\int F^{c(a+bx)^n}(a+bx)^{-1+\frac{n}{2}}\,dx &= \frac{2\,\text{Subst}\left(\int F^{cx^2}\,dx, x, (a+bx)^{n/2}\right)}{bn}\\ &= \frac{\sqrt{\pi}\,\text{erfi}\left(\sqrt{c}\,(a+bx)^{n/2}\sqrt{\log(F)}\right)}{b\sqrt{c}\,n\sqrt{\log(F)}}\end{aligned}$$

Mathematica [A] time = 0.01, size = 47, normalized size = 1.00

$$\frac{\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{c}\,\sqrt{\log(F)}\,(a+bx)^{n/2}\right)}{b\sqrt{c}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(c*(a + b*x)^n)*(a + b*x)^(-1 + n/2),x]
```

```
[Out] (Sqrt[Pi]*Erfi[Sqrt[c]*(a + b*x)^(n/2)*Sqrt[Log[F]]])/(b*Sqrt[c]*n*Sqrt[Log
[F]])
```

fricas [A] time = 0.43, size = 50, normalized size = 1.06

$$-\frac{\sqrt{\pi}\,\sqrt{-c\log(F)}\,\operatorname{erf}\left((bx+a)\sqrt{-c\log(F)}\,(bx+a)^{\frac{1}{2}n-1}\right)}{bcn\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(c*(b*x+a)^n)*(b*x+a)^(-1+1/2*n),x, algorithm="fricas")
```

```
[Out] -sqrt(pi)*sqrt(-c*log(F))*erf((b*x + a)*sqrt(-c*log(F))*(b*x + a)^(1/2*n -
1))/(b*c*n*log(F))
```

giac [A] time = 0.47, size = 37, normalized size = 0.79

$$-\frac{\sqrt{\pi}\,\operatorname{erf}\left(-\sqrt{-c\log(F)}\,\sqrt{(bx+a)^n}\right)}{\sqrt{-c\log(F)}\,bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(c*(b*x+a)^n)*(b*x+a)^(-1+1/2*n),x, algorithm="giac")
```

```
[Out] -sqrt(pi)*erf(-sqrt(-c*log(F))*sqrt((b*x + a)^n))/(sqrt(-c*log(F))*b*n)
```

maple [A] time = 0.17, size = 36, normalized size = 0.77

$$\frac{\sqrt{\pi}\;\operatorname{erf}\left(\sqrt{-c\ln(F)}\;(bx+a)^{\frac{n}{2}}\right)}{\sqrt{-c\ln(F)}\;bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(c*(b*x+a)^n)*(b*x+a)^(-1+1/2*n),x)
```

```
[Out] 1/n/b*Pi^(1/2)/(-c*ln(F))^(1/2)*erf((-c*ln(F))^(1/2)*(b*x+a)^(1/2*n))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (bx+a)^{\frac{1}{2}\,n-1} F^{(bx+a)^n c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(c*(b*x+a)^n)*(b*x+a)^(-1+1/2*n),x, algorithm="maxima")
[Out] integrate((b*x + a)^(1/2*n - 1)*F^((b*x + a)^n*c), x)
```

mupad [B] time = 3.95, size = 39, normalized size = 0.83

$$-\frac{\sqrt{\pi}\,\mathrm{erf}\left(\sqrt{c}\,\sqrt{\ln(F)}\,(a+b\,x)^{n/2}\,1\mathrm{i}\right)\,1\mathrm{i}}{b\,\sqrt{c}\,n\,\sqrt{\ln(F)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(c*(a + b*x)^n)*(a + b*x)^(n/2 - 1),x)
[Out] -(pi^(1/2)*erf(c^(1/2)*log(F)^(1/2)*(a + b*x)^(n/2)*1i)*1i)/(b*c^(1/2)*n*lo
g(F)^(1/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{c(a+bx)^n}\,(a+bx)^{\frac{n}{2}-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(c*(b*x+a)**n)*(b*x+a)**(-1+1/2*n),x)
[Out] Integral(F**(c*(a + b*x)**n)*(a + b*x)**(n/2 - 1), x)
```

3.381 $\int F^{-c(a+bx)^n}(a+bx)^{-1+\frac{n}{2}}\,dx$

Optimal. Leaf size=47

$$\frac{\sqrt{\pi}\,\mathrm{erf}\left(\sqrt{c}\,\sqrt{\log(F)}\,(a+bx)^{n/2}\right)}{b\sqrt{c}\,n\sqrt{\log(F)}}$$

```
[Out] erf((b*x+a)^(1/2*n)*c^(1/2)*ln(F)^(1/2))*Pi^(1/2)/b/n/c^(1/2)/ln(F)^(1/2)
```

Rubi [A] time = 0.05, antiderivative size = 47, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2211, 2205}

$$\frac{\sqrt{\pi}\,\mathrm{Erf}\left(\sqrt{c}\,\sqrt{\log(F)}\,(a+bx)^{n/2}\right)}{b\sqrt{c}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x)^(-1 + n/2)/F^(c*(a + b*x)^n),x]
```

```
[Out] (Sqrt[Pi]*Erf[Sqrt[c]*(a + b*x)^(n/2)*Sqrt[Log[F]]])/(b*Sqrt[c]*n*Sqrt[Log[
F]])
```

Rule 2205

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erf[(c + d*x)*Rt[-(b*Log[F]), 2]])/(2*d*Rt[-(b*Log[F]), 2]), x] /; Fr
eeQ[{F, a, b, c, d}, x] && NegQ[b]
```

Rule 2211

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rubi steps

$$\begin{aligned}\int F^{-c(a+bx)^n}(a+bx)^{-1+\frac{n}{2}}\,dx &= \frac{2\,\mathrm{Subst}\left(\int F^{-cx^2}\,dx, x, (a+bx)^{n/2}\right)}{bn}\\ &= \frac{\sqrt{\pi}\,\mathrm{erf}\left(\sqrt{c}\,(a+bx)^{n/2}\sqrt{\log(F)}\right)}{b\sqrt{c}\,n\sqrt{\log(F)}}\end{aligned}$$

Mathematica [A] time = 0.01, size = 47, normalized size = 1.00

$$\frac{\sqrt{\pi}\,\mathrm{erf}\left(\sqrt{c}\,\sqrt{\log(F)}\,(a+bx)^{n/2}\right)}{b\sqrt{c}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x)^(-1 + n/2)/F^(c*(a + b*x)^n),x]
```

```
[Out] (Sqrt[Pi]*Erf[Sqrt[c]*(a + b*x)^(n/2)*Sqrt[Log[F]]])/(b*Sqrt[c]*n*Sqrt[Log[
F]])
```

fricas [A] time = 0.47, size = 47, normalized size = 1.00

$$\frac{\sqrt{\pi}\,\sqrt{c\log(F)}\,\mathrm{erf}\left((bx+a)\sqrt{c\log(F)}\,(bx+a)^{\frac{1}{2}\,n-1}\right)}{bcn\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^(-1+1/2*n)/(F^(c*(b*x+a)^n)),x, algorithm="fricas")
```

```
[Out] sqrt(pi)*sqrt(c*log(F))*erf((b*x + a)*sqrt(c*log(F))*(b*x + a)^(1/2*n - 1))
/(b*c*n*log(F))
```

giac [A] time = 0.46, size = 35, normalized size = 0.74

$$-\frac{\sqrt{\pi}\,\mathrm{erf}\left(-\sqrt{c\log(F)}\,\sqrt{(bx+a)^{n}}\right)}{\sqrt{c\log(F)}\,bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^(-1+1/2*n)/(F^(c*(b*x+a)^n)),x, algorithm="giac")
```

```
[Out] -sqrt(pi)*erf(-sqrt(c*log(F))*sqrt((b*x + a)^n))/(sqrt(c*log(F))*b*n)
```

maple [A] time = 0.16, size = 34, normalized size = 0.72

$$\frac{\sqrt{\pi}\,\mathrm{erf}\left(\sqrt{c\ln(F)}\,(bx+a)^{\frac{n}{2}}\right)}{\sqrt{c\ln(F)}\,bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^(-1+1/2*n)/(F^(c*(b*x+a)^n)),x)
```

[Out] 1/n/b*Pi^(1/2)/(c*ln(F))^(1/2)*erf((c*ln(F))^(1/2)*(b*x+a)^(1/2*n))

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(bx+a)^{\frac{1}{2}n-1}}{F^{(bx+a)^n c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)^(-1+1/2*n)/(F^(c*(b*x+a)^n)),x, algorithm="maxima")

[Out] integrate((b*x + a)^(1/2*n - 1)/F^((b*x + a)^n*c), x)

mupad [B] time = 4.04, size = 35, normalized size = 0.74

$$\frac{\sqrt{\pi}\ \mathrm{erf}\left(\sqrt{c}\ \sqrt{\ln(F)}\ (a+b\,x)^{n/2}\right)}{b\,\sqrt{c}\ n\,\sqrt{\ln(F)}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((a + b*x)^(n/2 - 1)/F^(c*(a + b*x)^n),x)

[Out] (pi^(1/2)*erf(c^(1/2)*log(F)^(1/2)*(a + b*x)^(n/2)))/(b*c^(1/2)*n*log(F)^(1/2))

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*x+a)**(-1+1/2*n)/(F**(c*(b*x+a)**n)),x)

[Out] Timed out

3.382 $\int F^{a+b(c+dx)^2}(e+fx)^5\,dx$

Optimal. Leaf size=518

$$\frac{15\sqrt{\pi}\,f^4F^a(de-cf)\text{erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{8b^{5/2}d^6\log^{\frac{5}{2}}(F)}-\frac{5\sqrt{\pi}\,f^2F^a(de-cf)^3\text{erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{2b^{3/2}d^6\log^{\frac{3}{2}}(F)}+\frac{f^5F^{a+b(c+dx)^2}}{b^3d^6\log^3(F)}-$$

```
[Out] f^5*F^(a+b*(d*x+c)^2)/b^3/d^6/ln(F)^3-5*f^3*(-c*f+d*e)^2*F^(a+b*(d*x+c)^2)/
b^2/d^6/ln(F)^2-15/4*f^4*(-c*f+d*e)*F^(a+b*(d*x+c)^2)*(d*x+c)/b^2/d^6/ln(F)
^2-f^5*F^(a+b*(d*x+c)^2)*(d*x+c)^2/b^2/d^6/ln(F)^2+5/2*f*(-c*f+d*e)^4*F^(a+
b*(d*x+c)^2)/b/d^6/ln(F)+5*f^2*(-c*f+d*e)^3*F^(a+b*(d*x+c)^2)*(d*x+c)/b/d^6
/ln(F)+5*f^3*(-c*f+d*e)^2*F^(a+b*(d*x+c)^2)*(d*x+c)^2/b/d^6/ln(F)+5/2*f^4*(
-c*f+d*e)*F^(a+b*(d*x+c)^2)*(d*x+c)^3/b/d^6/ln(F)+1/2*f^5*F^(a+b*(d*x+c)^2)
*(d*x+c)^4/b/d^6/ln(F)+15/8*f^4*(-c*f+d*e)*F^a*erfi((d*x+c)*b^(1/2)*ln(F)^(
1/2))*Pi^(1/2)/b^(5/2)/d^6/ln(F)^(5/2)-5/2*f^2*(-c*f+d*e)^3*F^a*erfi((d*x+c
)*b^(1/2)*ln(F)^(1/2))*Pi^(1/2)/b^(3/2)/d^6/ln(F)^(3/2)+1/2*(-c*f+d*e)^5*F^
a*erfi((d*x+c)*b^(1/2)*ln(F)^(1/2))*Pi^(1/2)/d^6/b^(1/2)/ln(F)^(1/2)
```

Rubi [A] time = 0.94, antiderivative size = 518, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {2226, 2204, 2209, 2212}

$$-\frac{5\sqrt{\pi}\,f^2F^a(de-cf)^3\text{Erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{2b^{3/2}d^6\log^{\frac{3}{2}}(F)}+\frac{15\sqrt{\pi}\,f^4F^a(de-cf)\text{Erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{8b^{5/2}d^6\log^{\frac{5}{2}}(F)}-\frac{5f^3(de-cf}{b^2d^6\text{l}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)*(e + f*x)^5,x]
```

```
[Out] (f^5*F^(a + b*(c + d*x)^2))/(b^3*d^6*Log[F]^3) + (15*f^4*(d*e - c*f)*F^a*Sq
rt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]])/(8*b^(5/2)*d^6*Log[F]^(5/2)) -
 (5*f^3*(d*e - c*f)^2*F^(a + b*(c + d*x)^2))/(b^2*d^6*Log[F]^2) - (15*f^4*(
d*e - c*f)*F^(a + b*(c + d*x)^2)*(c + d*x))/(4*b^2*d^6*Log[F]^2) - (f^5*F^(
a + b*(c + d*x)^2)*(c + d*x)^2)/(b^2*d^6*Log[F]^2) - (5*f^2*(d*e - c*f)^3*F
^a*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]])/(2*b^(3/2)*d^6*Log[F]^(3/
2)) + (5*f*(d*e - c*f)^4*F^(a + b*(c + d*x)^2))/(2*b*d^6*Log[F]) + (5*f^2*(
d*e - c*f)^3*F^(a + b*(c + d*x)^2)*(c + d*x))/(b*d^6*Log[F]) + (5*f^3*(d*e
- c*f)^2*F^(a + b*(c + d*x)^2)*(c + d*x)^2)/(b*d^6*Log[F]) + (5*f^4*(d*e -
c*f)*F^(a + b*(c + d*x)^2)*(c + d*x)^3)/(2*b*d^6*Log[F]) + (f^5*F^(a + b*(c
 + d*x)^2)*(c + d*x)^4)/(2*b*d^6*Log[F]) + ((d*e - c*f)^5*F^a*Sqrt[Pi]*Erfi
[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]])/(2*Sqrt[b]*d^6*Sqrt[Log[F]])
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rule 2226

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int F^{a+b(c+dx)^2}(e+fx)^5\,dx = \int\left(\frac{(de-cf)^5F^{a+b(c+dx)^2}}{d^5}+\frac{5f(de-cf)^4F^{a+b(c+dx)^2}(c+dx)}{d^5}+\frac{10f^2(de-cf)^3F^{a+b(c+dx)^2}}{d^5}\right.$$

$$=\frac{f^5\int F^{a+b(c+dx)^2}(c+dx)^5\,dx}{d^5}+\frac{\left(5f^4(de-cf)\right)\int F^{a+b(c+dx)^2}(c+dx)^4\,dx}{d^5}+\frac{\left(10f^3(de-\right.}{}$$

$$=\frac{5f(de-cf)^4F^{a+b(c+dx)^2}}{2bd^6\log(F)}+\frac{5f^2(de-cf)^3F^{a+b(c+dx)^2}(c+dx)}{bd^6\log(F)}+\frac{5f^3(de-cf)^2F^{a+b(c+dx)^2}}{bd^6\log(F)}$$

$$=-\frac{5f^3(de-cf)^2F^{a+b(c+dx)^2}}{b^2d^6\log^2(F)}-\frac{15f^4(de-cf)F^{a+b(c+dx)^2}(c+dx)}{4b^2d^6\log^2(F)}-\frac{f^5F^{a+b(c+dx)^2}(c+dx)}{b^2d^6\log^2(F)}$$

$$=\frac{f^5F^{a+b(c+dx)^2}}{b^3d^6\log^3(F)}+\frac{15f^4(de-cf)F^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)}{8b^{5/2}d^6\log^{\frac{5}{2}}(F)}-\frac{5f^3(de-cf)^2F^{a+b(}}{b^2d^6\log^2(F)}$$

Mathematica [A] time = 0.62, size = 412, normalized size = 0.80

$$\frac{F^a\left(4\sqrt{\pi}b^{3/2}\log^{\frac{3}{2}}(F)(de-cf)^5\text{erfi}\left(\sqrt{b}\sqrt{\log(F)}(c+dx)\right)+\frac{15f^4(cf-de)\left(2\sqrt{b}\sqrt{\log(F)}(c+dx)F^{b(c+dx)^2}-\sqrt{\pi}\text{erfi}\left(\sqrt{b}\sqrt{\log(F)}(c\right.\right.}{\sqrt{b}\sqrt{\log(F)}}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)*(e + f*x)^5,x]
```

```
[Out] (F^a*(-40*f^3*(d*e - c*f)^2*F^(b*(c + d*x)^2) + (15*f^4*(-(d*e) + c*f)*(-(S
qrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]]) + 2*Sqrt[b]*F^(b*(c + d*x)^2)
*(c + d*x)*Sqrt[Log[F]]))/(Sqrt[b]*Sqrt[Log[F]]) + 20*Sqrt[b]*f^2*(-(d*e) +
 c*f)^3*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]]*Sqrt[Log[F]] + 20*b*f
*(d*e - c*f)^4*F^(b*(c + d*x)^2)*Log[F] + 40*b*f^2*(d*e - c*f)^3*F^(b*(c +
d*x)^2)*(c + d*x)*Log[F] + 40*b*f^3*(d*e - c*f)^2*F^(b*(c + d*x)^2)*(c + d*
x)^2*Log[F] + 20*b*f^4*(d*e - c*f)*F^(b*(c + d*x)^2)*(c + d*x)^3*Log[F] + 4
*b*f^5*F^(b*(c + d*x)^2)*(c + d*x)^4*Log[F] + 4*b^(3/2)*(d*e - c*f)^5*Sqrt[
Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]]*Log[F]^(3/2) + (8*f^5*F^(b*(c + d*
x)^2)*(1 - b*(c + d*x)^2*Log[F]))/(b*Log[F])))/(8*b^2*d^6*Log[F]^2)
```

fricas [A] time = 0.47, size = 531, normalized size = 1.03

$$-\frac{\sqrt{\pi}\left(15\,def^4-15\,cf^5+4\left(b^2d^5e^5-5\,b^2cd^4e^4f+10\,b^2c^2d^3e^3f^2-10\,b^2c^3d^2e^2f^3+5\,b^2c^4def^4-b^2c^5f^5\right)\log(F)\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(f*x+e)^5,x, algorithm="fricas")
```

```
[Out] -1/8*(sqrt(pi)*(15*d*e*f^4 - 15*c*f^5 + 4*(b^2*d^5*e^5 - 5*b^2*c*d^4*e^4*f
+ 10*b^2*c^2*d^3*e^3*f^2 - 10*b^2*c^3*d^2*e^2*f^3 + 5*b^2*c^4*d*e*f^4 - b^2
*c^5*f^5)*log(F)^2 - 20*(b*d^3*e^3*f^2 - 3*b*c*d^2*e^2*f^3 + 3*b*c^2*d*e*f^
4 - b*c^3*f^5)*log(F))*sqrt(-b*d^2*log(F))*F^a*erf(sqrt(-b*d^2*log(F))*(d*x
 + c)/d) - 2*(4*d*f^5 + 2*(b^2*d^5*f^5*x^4 + 5*b^2*d^5*e^4*f - 10*b^2*c*d^4
*e^3*f^2 + 10*b^2*c^2*d^3*e^2*f^3 - 5*b^2*c^3*d^2*e*f^4 + b^2*c^4*d*f^5 + (
5*b^2*d^5*e*f^4 - b^2*c*d^4*f^5)*x^3 + (10*b^2*d^5*e^2*f^3 - 5*b^2*c*d^4*e*
f^4 + b^2*c^2*d^3*f^5)*x^2 + (10*b^2*d^5*e^3*f^2 - 10*b^2*c*d^4*e^2*f^3 + 5
*b^2*c^2*d^3*e*f^4 - b^2*c^3*d^2*f^5)*x)*log(F)^2 - (4*b*d^3*f^5*x^2 + 20*b
*d^3*e^2*f^3 - 25*b*c*d^2*e*f^4 + 9*b*c^2*d*f^5 + (15*b*d^3*e*f^4 - 7*b*c*d
^2*f^5)*x)*log(F))*F^(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a))/(b^3*d^7*log(F)^3
)
```

giac [A] time = 0.50, size = 942, normalized size = 1.82

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(f*x+e)^5,x, algorithm="giac")
```

```
[Out] -1/2*sqrt(pi)*erf(-sqrt(-b*log(F))*d*(x + c/d))*e^(a*log(F) + 5)/(sqrt(-b*l
og(F))*d) + 5/2*(sqrt(pi)*c*f*erf(-sqrt(-b*log(F))*d*(x + c/d))*e^(a*log(F)
 + 4)/(sqrt(-b*log(F))*d) + f*e^(b*d^2*x^2*log(F) + 2*b*c*d*x*log(F) + b*c^
2*log(F) + a*log(F) + 4)/(b*d*log(F)))/d - 5/2*(sqrt(pi)*(2*b*c^2*f^2*log(F
) - f^2)*erf(-sqrt(-b*log(F))*d*(x + c/d))*e^(a*log(F) + 3)/(sqrt(-b*log(F)
)*b*d*log(F)) - 2*(d*f^2*(x + c/d) - 2*c*f^2)*e^(b*d^2*x^2*log(F) + 2*b*c*d
*x*log(F) + b*c^2*log(F) + a*log(F) + 3)/(b*d*log(F)))/d^2 + 5/2*(sqrt(pi)*
(2*b*c^3*f^3*log(F) - 3*c*f^3)*erf(-sqrt(-b*log(F))*d*(x + c/d))*e^(a*log(F
) + 2)/(sqrt(-b*log(F))*b*d*log(F)) + 2*(b*d^2*f^3*(x + c/d)^2*log(F) - 3*b
*c*d*f^3*(x + c/d)*log(F) + 3*b*c^2*f^3*log(F) - f^3)*e^(b*d^2*x^2*log(F) +
 2*b*c*d*x*log(F) + b*c^2*log(F) + a*log(F) + 2)/(b^2*d*log(F)^2))/d^3 - 5/
8*(sqrt(pi)*(4*b^2*c^4*f^4*log(F)^2 - 12*b*c^2*f^4*log(F) + 3*f^4)*erf(-sqr
t(-b*log(F))*d*(x + c/d))*e^(a*log(F) + 1)/(sqrt(-b*log(F))*b^2*d*log(F)^2)
 - 2*(2*b*d^3*f^4*(x + c/d)^3*log(F) - 8*b*c*d^2*f^4*(x + c/d)^2*log(F) + 1
2*b*c^2*d*f^4*(x + c/d)*log(F) - 8*b*c^3*f^4*log(F) - 3*d*f^4*(x + c/d) + 8
*c*f^4)*e^(b*d^2*x^2*log(F) + 2*b*c*d*x*log(F) + b*c^2*log(F) + a*log(F) +
1)/(b^2*d*log(F)^2))/d^4 + 1/8*(sqrt(pi)*(4*b^2*c^5*f^5*log(F)^2 - 20*b*c^3
*f^5*log(F) + 15*c*f^5)*F^a*erf(-sqrt(-b*log(F))*d*(x + c/d))/(sqrt(-b*log(
F))*b^2*d*log(F)^2) + 2*(2*b^2*d^4*f^5*(x + c/d)^4*log(F)^2 - 10*b^2*c*d^3*
f^5*(x + c/d)^3*log(F)^2 + 20*b^2*c^2*d^2*f^5*(x + c/d)^2*log(F)^2 - 20*b^2
*c^3*d*f^5*(x + c/d)*log(F)^2 + 10*b^2*c^4*f^5*log(F)^2 - 4*b*d^2*f^5*(x +
c/d)^2*log(F) + 15*b*c*d*f^5*(x + c/d)*log(F) - 20*b*c^2*f^5*log(F) + 4*f^5
)*e^(b*d^2*x^2*log(F) + 2*b*c*d*x*log(F) + b*c^2*log(F) + a*log(F))/(b^3*d*
log(F)^3))/d^5
```

maple [B] time = 0.12, size = 1657, normalized size = 3.20

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+(d*x+c)^2*b)*(f*x+e)^5,x)
```

```
[Out] -5/2*e*f^4*c/d^3/ln(F)/b*x^2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+5/2*
e*f^4*c^2/d^4/ln(F)/b*x*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-5*e^2*f^3
*c/d^3/ln(F)/b*x*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-5*e^2*f^3/ln(F)^
2/b^2/d^4*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+5/2*e^3*f^2/ln(F)/b/d^3
*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*erf(1/(-b*ln(F))^(1/2)*b*c*ln(F)-(-b*ln(F))^
(1/2)*d*x)+5/2*e^4*f/ln(F)/b/d^2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+
1/2*f^5/ln(F)/b/d^2*x^4*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+1/2*f^5*c
^4/d^6/ln(F)/b*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-5/2*f^5*c^3/d^6/ln
(F)/b*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*erf(1/(-b*ln(F))^(1/2)*b*c*ln(F)-(-b*ln
```

```
(F))^(1/2)*d*x)-9/4*f^5*c^2/d^6/ln(F)^2/b^2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(
b*c^2)*F^a+15/8*f^5*c/d^6/ln(F)^2/b^2*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*erf(1/(
-b*ln(F))^(1/2)*b*c*ln(F)-(-b*ln(F))^(1/2)*d*x)-f^5/ln(F)^2/b^2/d^4*x^2*F^(
b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-15/8*e*f^4/ln(F)^2/b^2/d^5*Pi^(1/2)*
F^a/(-b*ln(F))^(1/2)*erf(1/(-b*ln(F))^(1/2)*b*c*ln(F)-(-b*ln(F))^(1/2)*d*x)
-1/2*f^5*c/d^3/ln(F)/b*x^3*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+1/2*f^
5*c^2/d^4/ln(F)/b*x^2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-1/2*f^5*c^3
/d^5/ln(F)/b*x*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+7/4*f^5*c/d^5/ln(F
)^2/b^2*x*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+5/2*e*f^4/ln(F)/b/d^2*x
^3*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-5/2*e*f^4*c^3/d^5/ln(F)/b*F^(b
*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+15/2*e*f^4*c^2/d^5/ln(F)/b*Pi^(1/2)*F
^a/(-b*ln(F))^(1/2)*erf(1/(-b*ln(F))^(1/2)*b*c*ln(F)-(-b*ln(F))^(1/2)*d*x)+
25/4*e*f^4*c/d^5/ln(F)^2/b^2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-15/4
*e*f^4/ln(F)^2/b^2/d^4*x*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+5*e^2*f^
3/ln(F)/b/d^2*x^2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+5*e^2*f^3*c^2/d
^4/ln(F)/b*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-15/2*e^2*f^3*c/d^4/ln(
F)/b*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*erf(1/(-b*ln(F))^(1/2)*b*c*ln(F)-(-b*ln(
F))^(1/2)*d*x)-5*e^3*f^2*c/d^3/ln(F)/b*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2
)*F^a+5*e^3*f^2/ln(F)/b/d^2*x*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-1/2
*e^5*Pi^(1/2)*F^a/d/(-b*ln(F))^(1/2)*erf(1/(-b*ln(F))^(1/2)*b*c*ln(F)-(-b*l
n(F))^(1/2)*d*x)+f^5/ln(F)^3/b^3/d^6*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*
F^a+1/2*f^5*c^5/d^6*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*erf(1/(-b*ln(F))^(1/2)*b*
c*ln(F)-(-b*ln(F))^(1/2)*d*x)-5*e^3*f^2*c^2/d^3*Pi^(1/2)*F^a/(-b*ln(F))^(1/
2)*erf(1/(-b*ln(F))^(1/2)*b*c*ln(F)-(-b*ln(F))^(1/2)*d*x)+5/2*e^4*f*c/d^2*P
i^(1/2)*F^a/(-b*ln(F))^(1/2)*erf(1/(-b*ln(F))^(1/2)*b*c*ln(F)-(-b*ln(F))^(1
/2)*d*x)-5/2*e*f^4*c^4/d^5*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*erf(1/(-b*ln(F))^(
1/2)*b*c*ln(F)-(-b*ln(F))^(1/2)*d*x)+5*e^2*f^3*c^3/d^4*Pi^(1/2)*F^a/(-b*ln(
F))^(1/2)*erf(1/(-b*ln(F))^(1/2)*b*c*ln(F)-(-b*ln(F))^(1/2)*d*x)
```

maxima [B] time = 5.38, size = 1456, normalized size = 2.81

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(f*x+e)^5,x, algorithm="maxima")
```

```
[Out] -5/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b*c*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/
(b*d^2))) - 1)*log(F)^2/((b*log(F))^(3/2)*d^2*sqrt(-(b*d^2*x + b*c*d)^2*log
(F)/(b*d^2))) - F^((b*d^2*x + b*c*d)^2/(b*d^2))*b*log(F)/((b*log(F))^(3/2)*
d))*F^a*e^4*f/(sqrt(b*log(F))*d) + 5*(sqrt(pi)*(b*d^2*x + b*c*d)*b^2*c^2*(e
rf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^3/((b*log(F))^(5/
2)*d^3*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 2*F^((b*d^2*x + b*c*d)^
2/(b*d^2))*b^2*c*log(F)^2/((b*log(F))^(5/2)*d^2) - (b*d^2*x + b*c*d)^3*gamm
a(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F))^(5/2)*d^5*
(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)))*F^a*e^3*f^2/(sqrt(b*log(F))*d
```

```
) - 5*(sqrt(pi)*(b*d^2*x + b*c*d)*b^3*c^3*(erf(sqrt(-(b*d^2*x + b*c*d)^2*lo
g(F)/(b*d^2))) - 1)*log(F)^4/((b*log(F))^(7/2)*d^4*sqrt(-(b*d^2*x + b*c*d)^
2*log(F)/(b*d^2))) - 3*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^3*c^2*log(F)^3/((b
*log(F))^(7/2)*d^3) - 3*(b*d^2*x + b*c*d)^3*b*c*gamma(3/2, -(b*d^2*x + b*c*
d)^2*log(F)/(b*d^2))*log(F)^4/((b*log(F))^(7/2)*d^6*(-(b*d^2*x + b*c*d)^2*l
og(F)/(b*d^2))^(3/2)) + b^2*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*l
og(F)^2/((b*log(F))^(7/2)*d^3))*F^a*e^2*f^3/(sqrt(b*log(F))*d) + 5/2*(sqrt(
pi)*(b*d^2*x + b*c*d)*b^4*c^4*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2)
)) - 1)*log(F)^5/((b*log(F))^(9/2)*d^5*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*
d^2))) - 4*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^4*c^3*log(F)^4/((b*log(F))^(9/
2)*d^4) - 6*(b*d^2*x + b*c*d)^3*b^2*c^2*gamma(3/2, -(b*d^2*x + b*c*d)^2*log
(F)/(b*d^2))*log(F)^5/((b*log(F))^(9/2)*d^7*(-(b*d^2*x + b*c*d)^2*log(F)/(b
*d^2))^(3/2)) + 4*b^3*c*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F
)^3/((b*log(F))^(9/2)*d^4) - (b*d^2*x + b*c*d)^5*gamma(5/2, -(b*d^2*x + b*c
*d)^2*log(F)/(b*d^2))*log(F)^5/((b*log(F))^(9/2)*d^9*(-(b*d^2*x + b*c*d)^2*
log(F)/(b*d^2))^(5/2)))*F^a*e*f^4/(sqrt(b*log(F))*d) - 1/2*(sqrt(pi)*(b*d^2
*x + b*c*d)*b^5*c^5*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*lo
g(F)^6/((b*log(F))^(11/2)*d^6*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) -
5*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^5*c^4*log(F)^5/((b*log(F))^(11/2)*d^5)
- 10*(b*d^2*x + b*c*d)^3*b^3*c^3*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*
d^2))*log(F)^6/((b*log(F))^(11/2)*d^8*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))
^(3/2)) + 10*b^4*c^2*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^4
/((b*log(F))^(11/2)*d^5) - b^3*gamma(3, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2)
)*log(F)^3/((b*log(F))^(11/2)*d^5) - 5*(b*d^2*x + b*c*d)^5*b*c*gamma(5/2, -
(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^6/((b*log(F))^(11/2)*d^10*(-(b*d
^2*x + b*c*d)^2*log(F)/(b*d^2))^(5/2)))*F^a*f^5/(sqrt(b*log(F))*d) + 1/2*sq
rt(pi)*F^(b*c^2 + a)*e^5*erf(sqrt(-b*log(F))*d*x - b*c*log(F)/sqrt(-b*log(F
)))/(sqrt(-b*log(F))*F^(b*c^2)*d)
```

mupad [B] time = 4.11, size = 716, normalized size = 1.38

$$\frac{F^{b d^2 x^2} F^a F^{b c^2} F^{2 b c d x} \left(f^5 + \frac{\ln(F)^2 \left(2 F^a b^2 c^4 f^5 + 10 F^a b^2 d^4 e^4 f + 20 F^a b^2 c^2 d^2 e^2 f^3 - 10 F^a b^2 c^3 d e f^4 - 20 F^a b^2 c d^3 e^3 f^2\right)}{4 F^a} - \frac{\ln(F) \left(9 F^a b c^2 \cdots\right.}{\cdots}\right.}{b^3 d^6 \ln(F)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)*(e + f*x)^5,x)
```

```
[Out] (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*(f^5 + (log(F)^2*(2*F^a*b^2*c^4*
f^5 + 10*F^a*b^2*d^4*e^4*f + 20*F^a*b^2*c^2*d^2*e^2*f^3 - 10*F^a*b^2*c^3*d*
e*f^4 - 20*F^a*b^2*c*d^3*e^3*f^2))/(4*F^a) - (log(F)*(9*F^a*b*c^2*f^5 + 20*
F^a*b*d^2*e^2*f^3 - 25*F^a*b*c*d*e*f^4))/(4*F^a)))/(b^3*d^6*log(F)^3) - erf
i((b*c*d*log(F) + b*d^2*x*log(F))/(b*d^2*log(F))^(1/2))*(((F^a*pi^(1/2)*(15
```

```
*c*f^5 - 15*d*e*f^4))/(8*(b*d^2*log(F))^(1/2)) - (F^a*pi^(1/2)*log(F)*(20*b
*c^3*f^5 - 20*b*d^3*e^3*f^2 - 60*b*c^2*d*e*f^4 + 60*b*c*d^2*e^2*f^3))/(8*(b
*d^2*log(F))^(1/2)))/(b^2*d^5*log(F)^2) + (F^a*pi^(1/2)*(4*b^2*c^5*f^5 - 4*
b^2*d^5*e^5 - 40*b^2*c^2*d^3*e^3*f^2 + 40*b^2*c^3*d^2*e^2*f^3 + 20*b^2*c*d^
4*e^4*f - 20*b^2*c^4*d*e*f^4))/(8*b^2*d^5*(b*d^2*log(F))^(1/2))) - (F^(b*d^
2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*x*(log(F)*((b*c^3*f^5)/2 - 5*b*d^3*e^3*f
^2 - (5*b*c^2*d*e*f^4)/2 + 5*b*c*d^2*e^2*f^3) - (7*c*f^5)/4 + (15*d*e*f^4)/
4))/(b^2*d^5*log(F)^2) + (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*f^5*x^4
)/(2*b*d^2*log(F)) - (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*x^2*(f^5 -
(b*f^3*(c^2*f^2*log(F) + 10*d^2*e^2*log(F) - 5*c*d*e*f*log(F)))/2))/(b^2*d^
4*log(F)^2) - (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*f^4*x^3*(c*f - 5*d
*e))/(2*b*d^3*log(F))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+b(c+dx)^2} \left(e+fx\right)^5 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)*(f*x+e)**5,x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**2)*(e + f*x)**5, x)
```

3.383 $\int F^{a+b(c+dx)^2}(e+fx)^4\,dx$

Optimal. Leaf size=389

$$-\frac{3\sqrt{\pi}f^2F^a(de-cf)^2\text{erfi}\left(\sqrt{b}\sqrt{\log(F)}(c+dx)\right)}{2b^{3/2}d^5\log^{\frac{3}{2}}(F)}+\frac{3\sqrt{\pi}f^4F^a\text{erfi}\left(\sqrt{b}\sqrt{\log(F)}(c+dx)\right)}{8b^{5/2}d^5\log^{\frac{5}{2}}(F)}-\frac{2f^3(de-cf)F^{a+b(c+dx)^2}}{b^2d^5\log^2(F)}-$$

```
[Out] -2*f^3*(-c*f+d*e)*F^(a+b*(d*x+c)^2)/b^2/d^5/ln(F)^2-3/4*f^4*F^(a+b*(d*x+c)^
2)*(d*x+c)/b^2/d^5/ln(F)^2+2*f*(-c*f+d*e)^3*F^(a+b*(d*x+c)^2)/b/d^5/ln(F)+3
*f^2*(-c*f+d*e)^2*F^(a+b*(d*x+c)^2)*(d*x+c)/b/d^5/ln(F)+2*f^3*(-c*f+d*e)*F^
(a+b*(d*x+c)^2)*(d*x+c)^2/b/d^5/ln(F)+1/2*f^4*F^(a+b*(d*x+c)^2)*(d*x+c)^3/b
/d^5/ln(F)+3/8*f^4*F^a*erfi((d*x+c)*b^(1/2)*ln(F)^(1/2))*Pi^(1/2)/b^(5/2)/d
^5/ln(F)^(5/2)-3/2*f^2*(-c*f+d*e)^2*F^a*erfi((d*x+c)*b^(1/2)*ln(F)^(1/2))*P
i^(1/2)/b^(3/2)/d^5/ln(F)^(3/2)+1/2*(-c*f+d*e)^4*F^a*erfi((d*x+c)*b^(1/2)*l
n(F)^(1/2))*Pi^(1/2)/d^5/b^(1/2)/ln(F)^(1/2)
```

Rubi [A] time = 0.65, antiderivative size = 389, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {2226, 2204, 2209, 2212}

$$-\frac{3\sqrt{\pi}f^2F^a(de-cf)^2\text{Erfi}\left(\sqrt{b}\sqrt{\log(F)}(c+dx)\right)}{2b^{3/2}d^5\log^{\frac{3}{2}}(F)}-\frac{2f^3(de-cf)F^{a+b(c+dx)^2}}{b^2d^5\log^2(F)}+\frac{3\sqrt{\pi}f^4F^a\text{Erfi}\left(\sqrt{b}\sqrt{\log(F)}(c+dx)\right)}{8b^{5/2}d^5\log^{\frac{5}{2}}(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)*(e + f*x)^4,x]
```

```
[Out] (3*f^4*F^a*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]])/(8*b^(5/2)*d^5*Lo
g[F]^(5/2)) - (2*f^3*(d*e - c*f)*F^(a + b*(c + d*x)^2))/(b^2*d^5*Log[F]^2)
- (3*f^4*F^(a + b*(c + d*x)^2)*(c + d*x))/(4*b^2*d^5*Log[F]^2) - (3*f^2*(d*
e - c*f)^2*F^a*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]])/(2*b^(3/2)*d^
5*Log[F]^(3/2)) + (2*f*(d*e - c*f)^3*F^(a + b*(c + d*x)^2))/(b*d^5*Log[F])
+ (3*f^2*(d*e - c*f)^2*F^(a + b*(c + d*x)^2)*(c + d*x))/(b*d^5*Log[F]) + (2
*f^3*(d*e - c*f)*F^(a + b*(c + d*x)^2)*(c + d*x)^2)/(b*d^5*Log[F]) + (f^4*F
^(a + b*(c + d*x)^2)*(c + d*x)^3)/(2*b*d^5*Log[F]) + ((d*e - c*f)^4*F^a*Sqr
t[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]])/(2*Sqrt[b]*d^5*Sqrt[Log[F]])
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rule 2226

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int F^{a+b(c+dx)^2}(e+fx)^4\,dx = \int\left(\frac{(de-cf)^4F^{a+b(c+dx)^2}}{d^4}+\frac{4f(de-cf)^3F^{a+b(c+dx)^2}(c+dx)}{d^4}+\frac{6f^2(de-cf)^2F^{a+b(c+d}}{d^4}\right.$$

$$=\frac{f^4\int F^{a+b(c+dx)^2}(c+dx)^4\,dx}{d^4}+\frac{\left(4f^3(de-cf)\right)\int F^{a+b(c+dx)^2}(c+dx)^3\,dx}{d^4}+\frac{\left(6f^2(de-\right.}{}$$

$$=\frac{2f(de-cf)^3F^{a+b(c+dx)^2}}{bd^5\log(F)}+\frac{3f^2(de-cf)^2F^{a+b(c+dx)^2}(c+dx)}{bd^5\log(F)}+\frac{2f^3(de-cf)F^{a+b(c+dx)}}{bd^5\log(F)}$$

$$=-\frac{2f^3(de-cf)F^{a+b(c+dx)^2}}{b^2d^5\log^2(F)}-\frac{3f^4F^{a+b(c+dx)^2}(c+dx)}{4b^2d^5\log^2(F)}-\frac{3f^2(de-cf)^2F^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,(c\right.}{2b^{3/2}d^5\log^{\frac{3}{2}}(F)}$$

$$=\frac{3f^4F^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)}{8b^{5/2}d^5\log^{\frac{5}{2}}(F)}-\frac{2f^3(de-cf)F^{a+b(c+dx)^2}}{b^2d^5\log^2(F)}-\frac{3f^4F^{a+b(c+dx)^2}(c+}{4b^2d^5\log^2(F)}$$

Mathematica [A] time = 0.45, size = 220, normalized size = 0.57

$$\frac{F^a\left(\sqrt{\pi}\left(4b^2\log^2(F)(de-cf)^4-12bf^2\log(F)(de-cf)^2+3f^4\right)\mathrm{erfi}\left(\sqrt{b}\sqrt{\log(F)}\,(c+dx)\right)+2\sqrt{b}\,f\sqrt{\log(F)}\,F^{b(}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)*(e + f*x)^4,x]
```

```
[Out] (F^a*(2*Sqrt[b]*f*F^(b*(c + d*x)^2)*Sqrt[Log[F]]*(f^2*(-8*d*e + 5*c*f - 3*d
*f*x) + 2*b*(-(c^3*f^3) + c^2*d*f^2*(4*e + f*x) - c*d^2*f*(6*e^2 + 4*e*f*x
+ f^2*x^2) + d^3*(4*e^3 + 6*e^2*f*x + 4*e*f^2*x^2 + f^3*x^3))*Log[F]) + Sqr
t[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]]*(3*f^4 - 12*b*f^2*(d*e - c*f)^2*
Log[F] + 4*b^2*(d*e - c*f)^4*Log[F]^2)))/(8*b^(5/2)*d^5*Log[F]^(5/2))
```

fricas [A] time = 0.44, size = 364, normalized size = 0.94

$$-\frac{\sqrt{\pi}\left(3 f^4+4\left(b^2d^4e^4-4 b^2cd^3e^3f+6 b^2c^2d^2e^2f^2-4 b^2c^3def^3+b^2c^4f^4\right)\log(F)^2-12\left(bd^2e^2f^2-2 bcdef^3+bc\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(f*x+e)^4,x, algorithm="fricas")
```

```
[Out] -1/8*(sqrt(pi)*(3*f^4 + 4*(b^2*d^4*e^4 - 4*b^2*c*d^3*e^3*f + 6*b^2*c^2*d^2*
e^2*f^2 - 4*b^2*c^3*d*e*f^3 + b^2*c^4*f^4)*log(F)^2 - 12*(b*d^2*e^2*f^2 - 2
*b*c*d*e*f^3 + b*c^2*f^4)*log(F))*sqrt(-b*d^2*log(F))*F^a*erf(sqrt(-b*d^2*l
og(F))*(d*x + c)/d) - 2*(2*(b^2*d^4*f^4*x^3 + 4*b^2*d^4*e^3*f - 6*b^2*c*d^3
*e^2*f^2 + 4*b^2*c^2*d^2*e*f^3 - b^2*c^3*d*f^4 + (4*b^2*d^4*e*f^3 - b^2*c*d
^3*f^4)*x^2 + (6*b^2*d^4*e^2*f^2 - 4*b^2*c*d^3*e*f^3 + b^2*c^2*d^2*f^4)*x)*
log(F)^2 - (3*b*d^2*f^4*x + 8*b*d^2*e*f^3 - 5*b*c*d*f^4)*log(F))*F^(b*d^2*x
^2 + 2*b*c*d*x + b*c^2 + a))/(b^3*d^6*log(F)^3)
```

giac [A] time = 0.63, size = 644, normalized size = 1.66

$$-\frac{\sqrt{\pi}\ \mathrm{erf}\left(-\sqrt{-b\log(F)}\,d\left(x+\frac{c}{d}\right)\right)e^{\left(a\log(F)+4\right)}}{2\sqrt{-b\log(F)}\,d}+\frac{2\left(\frac{\sqrt{\pi}\,cf\,\mathrm{erf}\left(-\sqrt{-b\log(F)}\,d\left(x+\frac{c}{d}\right)\right)e^{\left(a\log(F)+3\right)}}{\sqrt{-b\log(F)}\,d}+\frac{fe^{\left(bd^2x^2\log(F)+2\,bcdx\log(F)+bc^2\log(F)\right.}}{bd\log(F)}\right.}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(f*x+e)^4,x, algorithm="giac")
```

```
[Out] -1/2*sqrt(pi)*erf(-sqrt(-b*log(F))*d*(x + c/d))*e^(a*log(F) + 4)/(sqrt(-b*l
og(F))*d) + 2*(sqrt(pi)*c*f*erf(-sqrt(-b*log(F))*d*(x + c/d))*e^(a*log(F) +
 3)/(sqrt(-b*log(F))*d) + f*e^(b*d^2*x^2*log(F) + 2*b*c*d*x*log(F) + b*c^2*
log(F) + a*log(F) + 3)/(b*d*log(F)))/d - 3/2*(sqrt(pi)*(2*b*c^2*f^2*log(F)
- f^2)*erf(-sqrt(-b*log(F))*d*(x + c/d))*e^(a*log(F) + 2)/(sqrt(-b*log(F))*
b*d*log(F)) - 2*(d*f^2*(x + c/d) - 2*c*f^2)*e^(b*d^2*x^2*log(F) + 2*b*c*d*x
*log(F) + b*c^2*log(F) + a*log(F) + 2)/(b*d*log(F)))/d^2 + (sqrt(pi)*(2*b*c
```

```
^3*f^3*log(F) - 3*c*f^3)*erf(-sqrt(-b*log(F))*d*(x + c/d))*e^(a*log(F) + 1)
/(sqrt(-b*log(F))*b*d*log(F)) + 2*(b*d^2*f^3*(x + c/d)^2*log(F) - 3*b*c*d*f
^3*(x + c/d)*log(F) + 3*b*c^2*f^3*log(F) - f^3)*e^(b*d^2*x^2*log(F) + 2*b*c
*d*x*log(F) + b*c^2*log(F) + a*log(F) + 1)/(b^2*d*log(F)^2))/d^3 - 1/8*(sqr
t(pi)*(4*b^2*c^4*f^4*log(F)^2 - 12*b*c^2*f^4*log(F) + 3*f^4)*F^a*erf(-sqrt(
-b*log(F))*d*(x + c/d))/(sqrt(-b*log(F))*b^2*d*log(F)^2) - 2*(2*b*d^3*f^4*(
x + c/d)^3*log(F) - 8*b*c*d^2*f^4*(x + c/d)^2*log(F) + 12*b*c^2*d*f^4*(x +
c/d)*log(F) - 8*b*c^3*f^4*log(F) - 3*d*f^4*(x + c/d) + 8*c*f^4)*e^(b*d^2*x^
2*log(F) + 2*b*c*d*x*log(F) + b*c^2*log(F) + a*log(F))/(b^2*d*log(F)^2))/d^
4
```

maple [B] time = 0.10, size = 1063, normalized size = 2.73

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+(d*x+c)^2*b)*(f*x+e)^4,x)
```

```
[Out] -1/2*e^4*Pi^(1/2)*F^a/d/(-b*ln(F))^(1/2)*erf(1/(-b*ln(F))^(1/2)*b*c*ln(F)-(
-b*ln(F))^(1/2)*d*x)+1/2*f^4/ln(F)/b/d^2*x^3*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^
(b*c^2)*F^a-1/2*f^4*c/d^3/ln(F)/b*x^2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)
*F^a+1/2*f^4*c^2/d^4/ln(F)/b*x*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-1/
2*f^4*c^3/d^5/ln(F)/b*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-1/2*f^4*c^4
/d^5*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*erf(1/(-b*ln(F))^(1/2)*b*c*ln(F)-(-b*ln(
F))^(1/2)*d*x)+3/2*f^4*c^2/d^5/ln(F)/b*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*erf(1/
(-b*ln(F))^(1/2)*b*c*ln(F)-(-b*ln(F))^(1/2)*d*x)+5/4*f^4*c/d^5/ln(F)^2/b^2*
F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-3/4*f^4/ln(F)^2/b^2/d^4*x*F^(b*d^
2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-3/8*f^4/ln(F)^2/b^2/d^5*Pi^(1/2)*F^a/(-b
*ln(F))^(1/2)*erf(1/(-b*ln(F))^(1/2)*b*c*ln(F)-(-b*ln(F))^(1/2)*d*x)+2*e*f^
3/ln(F)/b/d^2*x^2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-2*e*f^3*c/d^3/l
n(F)/b*x*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+2*e*f^3*c^2/d^4/ln(F)/b*
F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+2*e*f^3*c^3/d^4*Pi^(1/2)*F^a/(-b*
ln(F))^(1/2)*erf(1/(-b*ln(F))^(1/2)*b*c*ln(F)-(-b*ln(F))^(1/2)*d*x)-3*e*f^3
*c/d^4/ln(F)/b*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*erf(1/(-b*ln(F))^(1/2)*b*c*ln(
F)-(-b*ln(F))^(1/2)*d*x)-2*e*f^3/ln(F)^2/b^2/d^4*F^(b*d^2*x^2)*F^(2*b*c*d*x
)*F^(b*c^2)*F^a+3*e^2*f^2/ln(F)/b/d^2*x*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^
2)*F^a-3*e^2*f^2*c/d^3/ln(F)/b*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-3*
e^2*f^2*c^2/d^3*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*erf(1/(-b*ln(F))^(1/2)*b*c*ln
(F)-(-b*ln(F))^(1/2)*d*x)+3/2*e^2*f^2/ln(F)/b/d^3*Pi^(1/2)*F^a/(-b*ln(F))^(
1/2)*erf(1/(-b*ln(F))^(1/2)*b*c*ln(F)-(-b*ln(F))^(1/2)*d*x)+2*e^3*f/ln(F)/b
/d^2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+2*e^3*f*c/d^2*Pi^(1/2)*F^a/(
-b*ln(F))^(1/2)*erf(1/(-b*ln(F))^(1/2)*b*c*ln(F)-(-b*ln(F))^(1/2)*d*x)
```

maxima [B] time = 4.31, size = 1052, normalized size = 2.70

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(a+b*(d*x+c)^2)*(f*x+e)^4,x, algorithm="maxima")

[Out] -2*(sqrt(pi)*(b*d^2*x + b*c*d)*b*c*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^2/((b*log(F))^(3/2)*d^2*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - F^((b*d^2*x + b*c*d)^2/(b*d^2))*b*log(F)/((b*log(F))^(3/2)*d))*F^a*e^3*f/(sqrt(b*log(F))*d) + 3*(sqrt(pi)*(b*d^2*x + b*c*d)*b^2*c^2*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^3/((b*log(F))^(5/2)*d^3*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 2*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^2*c*log(F)^2/((b*log(F))^(5/2)*d^2) - (b*d^2*x + b*c*d)^3*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F))^(5/2)*d^5*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)))*F^a*e^2*f^2/(sqrt(b*log(F))*d) - 2*(sqrt(pi)*(b*d^2*x + b*c*d)*b^3*c^3*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^4/((b*log(F))^(7/2)*d^4*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 3*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^3*c^2*log(F)^3/((b*log(F))^(7/2)*d^3) - 3*(b*d^2*x + b*c*d)^3*b*c*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^4/((b*log(F))^(7/2)*d^6*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) + b^2*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^2/((b*log(F))^(7/2)*d^3))*F^a*e*f^3/(sqrt(b*log(F))*d) + 1/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b^4*c^4*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^5/((b*log(F))^(9/2)*d^5*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 4*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^4*c^3*log(F)^4/((b*log(F))^(9/2)*d^4) - 6*(b*d^2*x + b*c*d)^3*b^2*c^2*gamma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^5/((b*log(F))^(9/2)*d^7*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)) + 4*b^3*c*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F))^(9/2)*d^4) - (b*d^2*x + b*c*d)^5*gamma(5/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^5/((b*log(F))^(9/2)*d^9*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(5/2)))*F^a*f^4/(sqrt(b*log(F))*d) + 1/2*sqrt(pi)*F^(b*c^2 + a)*e^4*erf(sqrt(-b*log(F))*d*x - b*c*log(F)/sqrt(-b*log(F)))/(sqrt(-b*log(F))*F^(b*c^2)*d)

mupad [B] time = 3.68, size = 517, normalized size = 1.33

$$\operatorname{erfi}\left(\frac{b\,x\,\ln(F)\,d^2+b\,c\,\ln(F)\,d}{\sqrt{b\,d^2\,\ln(F)}}\right)\left(\frac{\frac{3\,F^a\,f^4\,\sqrt{\pi}}{8\,\sqrt{b\,d^2\,\ln(F)}}-\frac{F^a\,\sqrt{\pi}\,\ln(F)\left(12\,b\,c^2\,f^4-24\,b\,c\,d\,e\,f^3+12\,b\,d^2\,e^2\,f^2\right)}{8\,\sqrt{b\,d^2\,\ln(F)}}}{b^2\,d^4\,\ln(F)^2}+\frac{F^a\,\sqrt{\pi}\,\left(4\,b^2\,c^4\,f^4-16\,b\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(F^(a + b*(c + d*x)^2)*(e + f*x)^4,x)

[Out] erfi((b*c*d*log(F) + b*d^2*x*log(F))/(b*d^2*log(F))^(1/2))*(((3*F^a*f^4*pi^(1/2))/(8*(b*d^2*log(F))^(1/2)) - (F^a*pi^(1/2)*log(F)*(12*b*c^2*f^4 + 12*b*d^2*e^2*f^2 - 24*b*c*d*e*f^3))/(8*(b*d^2*log(F))^(1/2)))/(b^2*d^4*log(F)^2

```
) + (F^a*pi^(1/2)*(4*b^2*c^4*f^4 + 4*b^2*d^4*e^4 + 24*b^2*c^2*d^2*e^2*f^2 -
 16*b^2*c*d^3*e^3*f - 16*b^2*c^3*d*e*f^3))/(8*b^2*d^4*(b*d^2*log(F))^(1/2))
) + (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*((5*F^a*c*f^4 - 8*F^a*d*e*f^
3)/(4*F^a) - (b*(2*F^a*c^3*f^4*log(F) - 8*F^a*d^3*e^3*f*log(F) - 8*F^a*c^2*
d*e*f^3*log(F) + 12*F^a*c*d^2*e^2*f^2*log(F)))/(4*F^a)))/(b^2*d^5*log(F)^2)
 + (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*f^4*x^3)/(2*b*d^2*log(F)) + (
F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*x*(b*((c^2*f^4*log(F))/2 + 3*d^2*
e^2*f^2*log(F) - 2*c*d*e*f^3*log(F)) - (3*f^4)/4))/(b^2*d^4*log(F)^2) - (F^
(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*f^3*x^2*(c*f - 4*d*e))/(2*b*d^3*log
(F))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+b(c+dx)^2} \left(e+fx\right)^4 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)*(f*x+e)**4,x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**2)*(e + f*x)**4, x)
```

3.384 $\int F^{a+b(c+dx)^2}(e+fx)^3\,dx$

Optimal. Leaf size=258

$$-\frac{3\sqrt{\pi}\, f^2F^a(de-cf)\text{erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{4b^{3/2}d^4\log^{\frac{3}{2}}(F)}-\frac{f^3F^{a+b(c+dx)^2}}{2b^2d^4\log^2(F)}+\frac{\sqrt{\pi}\,F^a(de-cf)^3\text{erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{2\sqrt{b}\,d^4\sqrt{\log(F)}}+\frac{3f^2}{}$$

```
[Out] -1/2*f^3*F^(a+b*(d*x+c)^2)/b^2/d^4/ln(F)^2+3/2*f*(-c*f+d*e)^2*F^(a+b*(d*x+c
)^2)/b/d^4/ln(F)+3/2*f^2*(-c*f+d*e)*F^(a+b*(d*x+c)^2)*(d*x+c)/b/d^4/ln(F)+1
/2*f^3*F^(a+b*(d*x+c)^2)*(d*x+c)^2/b/d^4/ln(F)-3/4*f^2*(-c*f+d*e)*F^a*erfi(
(d*x+c)*b^(1/2)*ln(F)^(1/2))*Pi^(1/2)/b^(3/2)/d^4/ln(F)^(3/2)+1/2*(-c*f+d*e
)^3*F^a*erfi((d*x+c)*b^(1/2)*ln(F)^(1/2))*Pi^(1/2)/d^4/b^(1/2)/ln(F)^(1/2)
```

Rubi [A] time = 0.44, antiderivative size = 258, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {2226, 2204, 2209, 2212}

$$-\frac{3\sqrt{\pi}\, f^2F^a(de-cf)\text{Erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{4b^{3/2}d^4\log^{\frac{3}{2}}(F)}-\frac{f^3F^{a+b(c+dx)^2}}{2b^2d^4\log^2(F)}+\frac{\sqrt{\pi}\,F^a(de-cf)^3\text{Erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{2\sqrt{b}\,d^4\sqrt{\log(F)}}+\frac{3f}{}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)*(e + f*x)^3,x]
```

```
[Out] -(f^3*F^(a + b*(c + d*x)^2))/(2*b^2*d^4*Log[F]^2) - (3*f^2*(d*e - c*f)*F^a*
Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]])/(4*b^(3/2)*d^4*Log[F]^(3/2))
 + (3*f*(d*e - c*f)^2*F^(a + b*(c + d*x)^2))/(2*b*d^4*Log[F]) + (3*f^2*(d*e
 - c*f)*F^(a + b*(c + d*x)^2)*(c + d*x))/(2*b*d^4*Log[F]) + (f^3*F^(a + b*(
c + d*x)^2)*(c + d*x)^2)/(2*b*d^4*Log[F]) + ((d*e - c*f)^3*F^a*Sqrt[Pi]*Erf
i[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]])/(2*Sqrt[b]*d^4*Sqrt[Log[F]])
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rule 2226

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int F^{a+b(c+dx)^2}(e+fx)^3\,dx = \int\left(\frac{(de-cf)^3F^{a+b(c+dx)^2}}{d^3}+\frac{3f(de-cf)^2F^{a+b(c+dx)^2}(c+dx)}{d^3}+\frac{3f^2(de-cf)F^{a+b(c+dx}}{d^3}\right.$$

$$=\frac{f^3\int F^{a+b(c+dx)^2}(c+dx)^3\,dx}{d^3}+\frac{\left(3f^2(de-cf)\right)\int F^{a+b(c+dx)^2}(c+dx)^2\,dx}{d^3}+\frac{\left(3f(de-c\right.}{}$$

$$=\frac{3f(de-cf)^2F^{a+b(c+dx)^2}}{2bd^4\log(F)}+\frac{3f^2(de-cf)F^{a+b(c+dx)^2}(c+dx)}{2bd^4\log(F)}+\frac{f^3F^{a+b(c+dx)^2}(c+dx)^2}{2bd^4\log(F)}$$

$$=-\frac{f^3F^{a+b(c+dx)^2}}{2b^2d^4\log^2(F)}-\frac{3f^2(de-cf)F^a\sqrt{\pi}\,\text{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)}{4b^{3/2}d^4\log^{\frac{3}{2}}(F)}+\frac{3f(de-cf)^2F^{a+}}{2bd^4\log(F}$$

Mathematica [A] time = 0.26, size = 148, normalized size = 0.57

$$\frac{F^a\left(2fF^{b(c+dx)^2}\left(b\log(F)\left(c^2f^2-cdf(3e+fx)+d^2\left(3e^2+3efx+f^2x^2\right)\right)-f^2\right)+\sqrt{\pi}\sqrt{b}\sqrt{\log(F)}\,(de-cf)\left(2b\right.}{4b^2d^4\log^2(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)*(e + f*x)^3,x]
```

```
[Out] (F^a*(Sqrt[b]*(d*e - c*f)*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]]*Sqr
t[Log[F]]*(-3*f^2 + 2*b*(d*e - c*f)^2*Log[F]) + 2*f*F^(b*(c + d*x)^2)*(-f^2
 + b*(c^2*f^2 - c*d*f*(3*e + f*x) + d^2*(3*e^2 + 3*e*f*x + f^2*x^2))*Log[F]
)))/(4*b^2*d^4*Log[F]^2)
```

fricas [A] time = 0.48, size = 208, normalized size = 0.81

$$\frac{\sqrt{\pi}\left(3\,def^2-3\,cf^3-2\left(bd^3e^3-3\,bcd^2e^2f+3\,bc^2def^2-bc^3f^3\right)\log(F)\right)\sqrt{-bd^2\log(F)}\,F^a\operatorname{erf}\left(\frac{\sqrt{-bd^2\log(F)}\,(dx+c)}{d}\right)-}{4\,b^2d^5\log(F}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(f*x+e)^3,x, algorithm="fricas")
```

```
[Out] 1/4*(sqrt(pi)*(3*d*e*f^2 - 3*c*f^3 - 2*(b*d^3*e^3 - 3*b*c*d^2*e^2*f + 3*b*c
^2*d*e*f^2 - b*c^3*f^3)*log(F))*sqrt(-b*d^2*log(F))*F^a*erf(sqrt(-b*d^2*log
(F))*(d*x + c)/d) - 2*(d*f^3 - (b*d^3*f^3*x^2 + 3*b*d^3*e^2*f - 3*b*c*d^2*e
*f^2 + b*c^2*d*f^3 + (3*b*d^3*e*f^2 - b*c*d^2*f^3)*x)*log(F))*F^(b*d^2*x^2
+ 2*b*c*d*x + b*c^2 + a))/(b^2*d^5*log(F)^2)
```

giac [A] time = 0.48, size = 426, normalized size = 1.65

$$-\frac{\sqrt{\pi}\operatorname{erf}\left(-\sqrt{-b\log(F)}\,d\left(x+\frac{c}{d}\right)\right)e^{\left(a\log(F)+3\right)}}{2\sqrt{-b\log(F)}\,d}+\frac{3\left(\frac{\sqrt{\pi}\,cf\operatorname{erf}\left(-\sqrt{-b\log(F)}\,d\left(x+\frac{c}{d}\right)\right)e^{\left(a\log(F)+2\right)}}{\sqrt{-b\log(F)}\,d}+\frac{fe^{\left(bd^2x^2\log(F)+2\,bcdx\log(F)+bc^2\log(F)\right.}}{bd\log(F)}\right.}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(f*x+e)^3,x, algorithm="giac")
```

```
[Out] -1/2*sqrt(pi)*erf(-sqrt(-b*log(F))*d*(x + c/d))*e^(a*log(F) + 3)/(sqrt(-b*l
og(F))*d) + 3/2*(sqrt(pi)*c*f*erf(-sqrt(-b*log(F))*d*(x + c/d))*e^(a*log(F)
 + 2)/(sqrt(-b*log(F))*d) + f*e^(b*d^2*x^2*log(F) + 2*b*c*d*x*log(F) + b*c^
2*log(F) + a*log(F) + 2)/(b*d*log(F)))/d - 3/4*(sqrt(pi)*(2*b*c^2*f^2*log(F
) - f^2)*erf(-sqrt(-b*log(F))*d*(x + c/d))*e^(a*log(F) + 1)/(sqrt(-b*log(F)
)*b*d*log(F)) - 2*(d*f^2*(x + c/d) - 2*c*f^2)*e^(b*d^2*x^2*log(F) + 2*b*c*d
*x*log(F) + b*c^2*log(F) + a*log(F) + 1)/(b*d*log(F)))/d^2 + 1/4*(sqrt(pi)*
(2*b*c^3*f^3*log(F) - 3*c*f^3)*F^a*erf(-sqrt(-b*log(F))*d*(x + c/d))/(sqrt(
-b*log(F))*b*d*log(F)) + 2*(b*d^2*f^3*(x + c/d)^2*log(F) - 3*b*c*d*f^3*(x +
 c/d)*log(F) + 3*b*c^2*f^3*log(F) - f^3)*e^(b*d^2*x^2*log(F) + 2*b*c*d*x*lo
g(F) + b*c^2*log(F) + a*log(F))/(b^2*d*log(F)^2))/d^3
```

maple [B] time = 0.09, size = 617, normalized size = 2.39

$$\frac{f^3x^2F^aF^{b\,c^2}F^{b\,d^2x^2}F^{2bcdx}}{2b\,d^2\ln(F)}-\frac{c\,f^3x\,F^aF^{b\,c^2}F^{b\,d^2x^2}F^{2bcdx}}{2b\,d^3\ln(F)}+\frac{3e\,f^2x\,F^aF^{b\,c^2}F^{b\,d^2x^2}F^{2bcdx}}{2b\,d^2\ln(F)}+\frac{\sqrt{\pi}\;c^3f^3F^a\operatorname{erf}\left(\frac{bc\ln(F)}{\sqrt{-b\ln(F)}}-\sqrt{-b\ln}\right.}{2\sqrt{-b\ln(F)}\;d^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+(d*x+c)^2*b)*(f*x+e)^3,x)
```

```
[Out] -1/2*e^3*Pi^(1/2)*F^a/d/(-b*ln(F))^(1/2)*erf(1/(-b*ln(F))^(1/2)*b*c*ln(F)-(
-b*ln(F))^(1/2)*d*x)+1/2*f^3/ln(F)/b/d^2*x^2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^
(b*c^2)*F^a-1/2*f^3*c/d^3/ln(F)/b*x*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F
^a+1/2*f^3*c^2/d^4/ln(F)/b*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+1/2*f^
3*c^3/d^4*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*erf(1/(-b*ln(F))^(1/2)*b*c*ln(F)-(-
b*ln(F))^(1/2)*d*x)-3/4*f^3*c/d^4/ln(F)/b*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*erf
(1/(-b*ln(F))^(1/2)*b*c*ln(F)-(-b*ln(F))^(1/2)*d*x)-1/2*f^3/ln(F)^2/b^2/d^4
*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+3/2*e*f^2/ln(F)/b/d^2*x*F^(b*d^2
*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-3/2*e*f^2*c/d^3/ln(F)/b*F^(b*d^2*x^2)*F^(
2*b*c*d*x)*F^(b*c^2)*F^a-3/2*e*f^2*c^2/d^3*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*er
f(1/(-b*ln(F))^(1/2)*b*c*ln(F)-(-b*ln(F))^(1/2)*d*x)+3/4*e*f^2/ln(F)/b/d^3*
Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*erf(1/(-b*ln(F))^(1/2)*b*c*ln(F)-(-b*ln(F))^(
1/2)*d*x)+3/2*e^2*f/ln(F)/b/d^2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+3
/2*e^2*f*c/d^2*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*erf(1/(-b*ln(F))^(1/2)*b*c*ln(
F)-(-b*ln(F))^(1/2)*d*x)
```

maxima [B] time = 3.28, size = 695, normalized size = 2.69

$$-\frac{3\left(\frac{\sqrt{\pi}\left(bd^2x+bcd\right)bc\left(\operatorname{erf}\left(\sqrt{-\frac{\left(bd^2x+bcd\right)^2\log(F)}{bd^2}}\right)-1\right)\log(F)^2}{\left(b\log(F)\right)^{\frac{3}{2}}d^2\sqrt{-\frac{\left(bd^2x+bcd\right)^2\log(F)}{bd^2}}}-\frac{F^{\frac{\left(bd^2x+bcd\right)^2}{bd^2}}b\log(F)}{\left(b\log(F)\right)^{\frac{3}{2}}d}\right)F^ae^2f}{2\sqrt{b\log(F)}\,d}+\frac{3\left(\frac{\sqrt{\pi}\left(bd^2x+bcd\right)b^2c^2\left(\operatorname{erf}\left(\sqrt{-\frac{\left(bd^2x+bcd\right)^2\log(F}{bd^2}}\right.\right.}{\left(b\log(F)\right)^{\frac{5}{2}}d^3\sqrt{-\frac{\left(bd^2x+bcd\right)^2\log(}{bd^2}}}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(f*x+e)^3,x, algorithm="maxima")
```

```
[Out] -3/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b*c*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/
(b*d^2))) - 1)*log(F)^2/((b*log(F))^(3/2)*d^2*sqrt(-(b*d^2*x + b*c*d)^2*log
(F)/(b*d^2))) - F^((b*d^2*x + b*c*d)^2/(b*d^2))*b*log(F)/((b*log(F))^(3/2)*
d))*F^a*e^2*f/(sqrt(b*log(F))*d) + 3/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b^2*c^2*
(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^3/((b*log(F))^(
5/2)*d^3*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 2*F^((b*d^2*x + b*c*d
)^2/(b*d^2))*b^2*c*log(F)^2/((b*log(F))^(5/2)*d^2) - (b*d^2*x + b*c*d)^3*ga
mma(3/2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F))^(5/2)*d^
5*(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)))*F^a*e*f^2/(sqrt(b*log(F))*d
) - 1/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b^3*c^3*(erf(sqrt(-(b*d^2*x + b*c*d)^2*
log(F)/(b*d^2))) - 1)*log(F)^4/((b*log(F))^(7/2)*d^4*sqrt(-(b*d^2*x + b*c*d
)^2*log(F)/(b*d^2))) - 3*F^((b*d^2*x + b*c*d)^2/(b*d^2))*b^3*c^2*log(F)^3/(
(b*log(F))^(7/2)*d^3) - 3*(b*d^2*x + b*c*d)^3*b*c*gamma(3/2, -(b*d^2*x + b*
c*d)^2*log(F)/(b*d^2))*log(F)^4/((b*log(F))^(7/2)*d^6*(-(b*d^2*x + b*c*d)^2
*log(F)/(b*d^2))^(3/2)) + b^2*gamma(2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))
```

```
*log(F)^2/((b*log(F))^(7/2)*d^3))*F^a*f^3/(sqrt(b*log(F))*d) + 1/2*sqrt(pi)
*F^(b*c^2 + a)*e^3*erf(sqrt(-b*log(F))*d*x - b*c*log(F)/sqrt(-b*log(F)))/(s
qrt(-b*log(F))*F^(b*c^2)*d)
```

mupad [B] time = 3.76, size = 313, normalized size = 1.21

$$\frac{F^a\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\,x\,\ln(F)\,d^2+b\,c\,\ln(F)\,d}{\sqrt{b\,d^2\,\ln(F)}}\right)\left(-2\,b\,\ln(F)\,c^3\,f^3+6\,b\,\ln(F)\,c^2\,d\,e\,f^2-6\,b\,\ln(F)\,c\,d^2\,e^2\,f+3\,c\,f^3+2\,b\,\ln(F)\,d^3\,e}{4\,b\,d^3\,\ln(F)\sqrt{b\,d^2\,\ln(F)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)*(e + f*x)^3,x)
```

```
[Out] (F^a*pi^(1/2)*erfi((b*c*d*log(F) + b*d^2*x*log(F))/(b*d^2*log(F))^(1/2))*(3
*c*f^3 - 3*d*e*f^2 - 2*b*c^3*f^3*log(F) + 2*b*d^3*e^3*log(F) - 6*b*c*d^2*e^
2*f*log(F) + 6*b*c^2*d*e*f^2*log(F)))/(4*b*d^3*log(F)*(b*d^2*log(F))^(1/2))
 - F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*(f^3/(2*b^2*d^4*log(F)^2) - (3
*e^2*f)/(2*b*d^2*log(F)) - (c^2*f^3)/(2*b*d^4*log(F)) + (3*c*e*f^2)/(2*b*d^
3*log(F))) - (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*x*(c*f^3 - 3*d*e*f^
2))/(2*b*d^3*log(F)) + (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*f^3*x^2)/
(2*b*d^2*log(F))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+b(c+dx)^2}\left(e+fx\right)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)*(f*x+e)**3,x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**2)*(e + f*x)**3, x)
```

3.385 $\int F^{a+b(c+dx)^2}(e+fx)^2\,dx$

Optimal. Leaf size=170

$$-\frac{\sqrt{\pi}\,f^2F^a\text{erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{4b^{3/2}d^3\log^{\frac{3}{2}}(F)}+\frac{\sqrt{\pi}\,F^a(de-cf)^2\text{erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{2\sqrt{b}\,d^3\sqrt{\log(F)}}+\frac{f(de-cf)F^{a+b(c+dx)^2}}{bd^3\log(F)}+\frac{f^2(c$$

```
[Out] f*(-c*f+d*e)*F^(a+b*(d*x+c)^2)/b/d^3/ln(F)+1/2*f^2*F^(a+b*(d*x+c)^2)*(d*x+c
)/b/d^3/ln(F)-1/4*f^2*F^a*erfi((d*x+c)*b^(1/2)*ln(F)^(1/2))*Pi^(1/2)/b^(3/2
)/d^3/ln(F)^(3/2)+1/2*(-c*f+d*e)^2*F^a*erfi((d*x+c)*b^(1/2)*ln(F)^(1/2))*Pi
^(1/2)/d^3/b^(1/2)/ln(F)^(1/2)
```

Rubi [A] time = 0.31, antiderivative size = 170, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {2226, 2204, 2209, 2212}

$$-\frac{\sqrt{\pi}\,f^2F^a\text{Erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{4b^{3/2}d^3\log^{\frac{3}{2}}(F)}+\frac{\sqrt{\pi}\,F^a(de-cf)^2\text{Erfi}\left(\sqrt{b}\,\sqrt{\log(F)}\,(c+dx)\right)}{2\sqrt{b}\,d^3\sqrt{\log(F)}}+\frac{f(de-cf)F^{a+b(c+dx)^2}}{bd^3\log(F)}+\frac{f^2(c$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)*(e + f*x)^2,x]
```

```
[Out] -(f^2*F^a*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]])/(4*b^(3/2)*d^3*Log
[F]^(3/2)) + (f*(d*e - c*f)*F^(a + b*(c + d*x)^2))/(b*d^3*Log[F]) + (f^2*F^
(a + b*(c + d*x)^2)*(c + d*x))/(2*b*d^3*Log[F]) + ((d*e - c*f)^2*F^a*Sqrt[P
i]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]])/(2*Sqrt[b]*d^3*Sqrt[Log[F]])
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
```

```
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rule 2226

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\begin{aligned}\int F^{a+b(c+dx)^2}(e+fx)^2\,dx &= \int \left(\frac{(de-cf)^2F^{a+b(c+dx)^2}}{d^2}+\frac{2f(de-cf)F^{a+b(c+dx)^2}(c+dx)}{d^2}+\frac{f^2F^{a+b(c+dx)^2}(c+dx)^2}{d^2}\right)\\
&= \frac{f^2\int F^{a+b(c+dx)^2}(c+dx)^2\,dx}{d^2}+\frac{(2f(de-cf))\int F^{a+b(c+dx)^2}(c+dx)\,dx}{d^2}+\frac{(de-cf)^2\int F}{d^2}\\
&= \frac{f(de-cf)F^{a+b(c+dx)^2}}{bd^3\log(F)}+\frac{f^2F^{a+b(c+dx)^2}(c+dx)}{2bd^3\log(F)}+\frac{(de-cf)^2F^a\sqrt{\pi}\operatorname{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log}\right.}{2\sqrt{b}\,d^3\sqrt{\log(F)}}\\
&= -\frac{f^2F^a\sqrt{\pi}\operatorname{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)}{4b^{3/2}d^3\log^{\frac{3}{2}}(F)}+\frac{f(de-cf)F^{a+b(c+dx)^2}}{bd^3\log(F)}+\frac{f^2F^{a+b(c+dx)^2}(c+dx)}{2bd^3\log(F)}\end{aligned}$$

Mathematica [A] time = 0.23, size = 105, normalized size = 0.62

$$\frac{F^a\left(\sqrt{\pi}\left(2b\log(F)(de-cf)^2-f^2\right)\operatorname{erfi}\left(\sqrt{b}\sqrt{\log(F)}\,(c+dx)\right)+2\sqrt{b}\,f\sqrt{\log(F)}\,F^{b(c+dx)^2}(-cf+2de+dfx)\right)}{4b^{3/2}d^3\log^{\frac{3}{2}}(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)*(e + f*x)^2,x]
```

```
[Out] (F^a*(2*Sqrt[b]*f*F^(b*(c + d*x)^2)*(2*d*e - c*f + d*f*x)*Sqrt[Log[F]] + Sq
rt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]]*(-f^2 + 2*b*(d*e - c*f)^2*Log[F
])))/(4*b^(3/2)*d^3*Log[F]^(3/2))
```

fricas [A] time = 0.44, size = 135, normalized size = 0.79

$$\frac{\sqrt{\pi}\sqrt{-bd^2\log(F)}\left(f^2-2\left(bd^2e^2-2\,bcdef+bc^2f^2\right)\log(F)\right)F^a\operatorname{erf}\left(\frac{\sqrt{-bd^2\log(F)}\,(dx+c)}{d}\right)+2\left(bd^2f^2x+2\,bd^2ef-bca\right.}{4\,b^2d^4\log(F)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(f*x+e)^2,x, algorithm="fricas")
```

```
[Out] 1/4*(sqrt(pi)*sqrt(-b*d^2*log(F))*(f^2 - 2*(b*d^2*e^2 - 2*b*c*d*e*f + b*c^2
*f^2)*log(F))*F^a*erf(sqrt(-b*d^2*log(F))*(d*x + c)/d) + 2*(b*d^2*f^2*x + 2
*b*d^2*e*f - b*c*d*f^2)*F^(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a)*log(F))/(b^2*
d^4*log(F)^2)
```

giac [A] time = 0.54, size = 258, normalized size = 1.52

$$-\frac{\sqrt{\pi}\,\operatorname{erf}\left(-\sqrt{-b\log(F)}\,d\left(x+\frac{c}{d}\right)\right)e^{\left(a\log(F)+2\right)}}{2\sqrt{-b\log(F)}\,d}+\frac{\frac{\sqrt{\pi}\,cf\operatorname{erf}\left(-\sqrt{-b\log(F)}\,d\left(x+\frac{c}{d}\right)\right)e^{\left(a\log(F)+1\right)}}{\sqrt{-b\log(F)}\,d}+\frac{fe^{\left(bd^2x^2\log(F)+2\,bcdx\log(F)+bc^2\log(F)+\cdots\right.}}{bd\log(F)}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(f*x+e)^2,x, algorithm="giac")
```

```
[Out] -1/2*sqrt(pi)*erf(-sqrt(-b*log(F))*d*(x + c/d))*e^(a*log(F) + 2)/(sqrt(-b*l
og(F))*d) + (sqrt(pi)*c*f*erf(-sqrt(-b*log(F))*d*(x + c/d))*e^(a*log(F) + 1
)/(sqrt(-b*log(F))*d) + f*e^(b*d^2*x^2*log(F) + 2*b*c*d*x*log(F) + b*c^2*lo
g(F) + a*log(F) + 1)/(b*d*log(F)))/d - 1/4*(sqrt(pi)*(2*b*c^2*f^2*log(F) -
f^2)*F^a*erf(-sqrt(-b*log(F))*d*(x + c/d))/(sqrt(-b*log(F))*b*d*log(F)) - 2
*(d*f^2*(x + c/d) - 2*c*f^2)*e^(b*d^2*x^2*log(F) + 2*b*c*d*x*log(F) + b*c^2
*log(F) + a*log(F))/(b*d*log(F)))/d^2
```

maple [B] time = 0.08, size = 324, normalized size = 1.91

$$\frac{f^2x\,F^aF^{b\,c^2}F^{b\,d^2x^2}F^{2bcdx}}{2b\,d^2\ln(F)}-\frac{\sqrt{\pi}\;c^2f^2F^a\operatorname{erf}\left(\frac{bc\ln(F)}{\sqrt{-b\ln(F)}}-\sqrt{-b\ln(F)}\;dx\right)}{2\sqrt{-b\ln(F)}\;d^3}+\frac{\sqrt{\pi}\;cef\,F^a\operatorname{erf}\left(\frac{bc\ln(F)}{\sqrt{-b\ln(F)}}-\sqrt{-b\ln(F)}\;dx\right)}{\sqrt{-b\ln(F)}\;d^2}-\cdots$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+(d*x+c)^2*b)*(f*x+e)^2,x)
```

```
[Out] -1/2*e^2*Pi^(1/2)*F^a/d/(-b*ln(F))^(1/2)*erf(1/(-b*ln(F))^(1/2)*b*c*ln(F)-(
-b*ln(F))^(1/2)*d*x)+1/2*f^2/ln(F)/b/d^2*x*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b
*c^2)*F^a-1/2*f^2*c/d^3/ln(F)/b*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a-1
/2*f^2*c^2/d^3*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*erf(1/(-b*ln(F))^(1/2)*b*c*ln(
F)-(-b*ln(F))^(1/2)*d*x)+1/4*f^2/ln(F)/b/d^3*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*
erf(1/(-b*ln(F))^(1/2)*b*c*ln(F)-(-b*ln(F))^(1/2)*d*x)+e*f/ln(F)/b/d^2*F^(b
*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*F^a+e*f*c/d^2*Pi^(1/2)*F^a/(-b*ln(F))^(1/
2)*erf(1/(-b*ln(F))^(1/2)*b*c*ln(F)-(-b*ln(F))^(1/2)*d*x)
```

maxima [B] time = 2.44, size = 422, normalized size = 2.48

$$-\frac{\left(\frac{\sqrt{\pi}\left(bd^2x+bcd\right)bc\left(\operatorname{erf}\left(\sqrt{-\frac{\left(bd^2x+bcd\right)^2\log(F)}{bd^2}}\right)-1\right)\log(F)^2}{\left(b\log(F)\right)^{\frac{3}{2}}d^2\sqrt{-\frac{\left(bd^2x+bcd\right)^2\log(F)}{bd^2}}}-\frac{F^{\frac{\left(bd^2x+bcd\right)^2}{bd^2}}b\log(F)}{\left(b\log(F)\right)^{\frac{3}{2}}d}\right)F^aef}{\sqrt{b\log(F)}\,d}+\frac{\left(\frac{\sqrt{\pi}\left(bd^2x+bcd\right)b^2c^2\left(\operatorname{erf}\left(\sqrt{-\frac{\left(bd^2x+bcd\right)^2\log(F)}{bd^2}}\right)-1\right)\mathrm{l}}{\left(b\log(F)\right)^{\frac{5}{2}}d^3\sqrt{-\frac{\left(bd^2x+bcd\right)^2\log(F)}{bd^2}}}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(f*x+e)^2,x, algorithm="maxima")
```

```
[Out] -(sqrt(pi)*(b*d^2*x + b*c*d)*b*c*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d
^2))) - 1)*log(F)^2/((b*log(F))^(3/2)*d^2*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/
(b*d^2))) - F^((b*d^2*x + b*c*d)^2/(b*d^2))*b*log(F)/((b*log(F))^(3/2)*d))*
F^a*e*f/(sqrt(b*log(F))*d) + 1/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b^2*c^2*(erf(s
qrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 1)*log(F)^3/((b*log(F))^(5/2)*d
^3*sqrt(-(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))) - 2*F^((b*d^2*x + b*c*d)^2/(b
*d^2))*b^2*c*log(F)^2/((b*log(F))^(5/2)*d^2) - (b*d^2*x + b*c*d)^3*gamma(3/
2, -(b*d^2*x + b*c*d)^2*log(F)/(b*d^2))*log(F)^3/((b*log(F))^(5/2)*d^5*(-(b
*d^2*x + b*c*d)^2*log(F)/(b*d^2))^(3/2)))*F^a*f^2/(sqrt(b*log(F))*d) + 1/2*
sqrt(pi)*F^(b*c^2 + a)*e^2*erf(sqrt(-b*log(F))*d*x - b*c*log(F)/sqrt(-b*log
(F)))/(sqrt(-b*log(F))*F^(b*c^2)*d)
```

mupad [B] time = 3.82, size = 194, normalized size = 1.14

$$\frac{F^{b\,d^2\,x^2}\,F^a\,F^{b\,c^2}\,F^{2\,b\,c\,d\,x}\,f^2\,x}{2\,b\,d^2\,\ln(F)}-\frac{F^a\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\,x\,\ln(F)\,d^2+b\,c\,\ln(F)\,d}{\sqrt{b\,d^2\,\ln(F)}}\right)\left(-2\,b\,\ln(F)\,c^2\,f^2+4\,b\,\ln(F)\,c\,d\,e\,f-2\,b\,\ln(F)\,d^2\,e^2+\right.}{4\,b\,d^2\,\ln(F)\,\sqrt{b\,d^2\,\ln(F)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)*(e + f*x)^2,x)
```

```
[Out] (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*f^2*x)/(2*b*d^2*log(F)) - (F^a*p
i^(1/2)*erfi((b*c*d*log(F) + b*d^2*x*log(F))/(b*d^2*log(F))^(1/2))*(f^2 - 2
*b*c^2*f^2*log(F) - 2*b*d^2*e^2*log(F) + 4*b*c*d*e*f*log(F)))/(4*b*d^2*log(
F)*(b*d^2*log(F))^(1/2)) - F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*((c*f^
2)/(2*b*d^3*log(F)) - (e*f)/(b*d^2*log(F)))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+b(c+dx)^2}\left(e+fx\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)*(f*x+e)**2,x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**2)*(e + f*x)**2, x)
```

3.386 $\int F^{a+b(c+dx)^2}(e+fx)\,dx$

Optimal. Leaf size=81

$$\frac{\sqrt{\pi}F^a(de-cf)\text{erfi}\left(\sqrt{b}\sqrt{\log(F)}(c+dx)\right)}{2\sqrt{b}d^2\sqrt{\log(F)}}+\frac{fF^{a+b(c+dx)^2}}{2bd^2\log(F)}$$

```
[Out] 1/2*f*F^(a+b*(d*x+c)^2)/b/d^2/ln(F)+1/2*(-c*f+d*e)*F^a*erfi((d*x+c)*b^(1/2)
*ln(F)^(1/2))*Pi^(1/2)/d^2/b^(1/2)/ln(F)^(1/2)
```

Rubi [A] time = 0.15, antiderivative size = 81, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {2226, 2204, 2209}

$$\frac{\sqrt{\pi}F^a(de-cf)\text{Erfi}\left(\sqrt{b}\sqrt{\log(F)}(c+dx)\right)}{2\sqrt{b}d^2\sqrt{\log(F)}}+\frac{fF^{a+b(c+dx)^2}}{2bd^2\log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2)*(e + f*x),x]
```

```
[Out] (f*F^(a + b*(c + d*x)^2))/(2*b*d^2*Log[F]) + ((d*e - c*f)*F^a*Sqrt[Pi]*Erfi
[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]])/(2*Sqrt[b]*d^2*Sqrt[Log[F]])
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2226

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int F^{a+b(c+dx)^2}(e+fx)\,dx = \int \left(\frac{(de-cf)F^{a+b(c+dx)^2}}{d} + \frac{fF^{a+b(c+dx)^2}(c+dx)}{d}\right) dx$$
$$= \frac{f\int F^{a+b(c+dx)^2}(c+dx)\,dx}{d} + \frac{(de-cf)\int F^{a+b(c+dx)^2}\,dx}{d}$$
$$= \frac{fF^{a+b(c+dx)^2}}{2bd^2\log(F)} + \frac{(de-cf)F^a\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)}{2\sqrt{b}\,d^2\sqrt{\log(F)}}$$

Mathematica [A] time = 0.07, size = 74, normalized size = 0.91

$$\frac{F^a\left(\sqrt{\pi}\sqrt{b}\sqrt{\log(F)}\,(de-cf)\mathrm{erfi}\left(\sqrt{b}\sqrt{\log(F)}\,(c+dx)\right)+fF^{b(c+dx)^2}\right)}{2bd^2\log(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2)*(e + f*x),x]
```

```
[Out] (F^a*(f*F^(b*(c + d*x)^2) + Sqrt[b]*(d*e - c*f)*Sqrt[Pi]*Erfi[Sqrt[b]*(c +
d*x)*Sqrt[Log[F]]]*Sqrt[Log[F]]))/(2*b*d^2*Log[F])
```

fricas [A] time = 0.46, size = 85, normalized size = 1.05

$$-\frac{\sqrt{\pi}\sqrt{-bd^2\log(F)}\left(de-cf\right)F^a\,\mathrm{erf}\left(\frac{\sqrt{-bd^2\log(F)}\,(dx+c)}{d}\right)-F^{bd^2x^2+2\,bcdx+bc^2+a}df}{2\,bd^3\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(f*x+e),x, algorithm="fricas")
```

```
[Out] -1/2*(sqrt(pi)*sqrt(-b*d^2*log(F))*(d*e - c*f)*F^a*erf(sqrt(-b*d^2*log(F))*
(d*x + c)/d) - F^(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a)*d*f)/(b*d^3*log(F))
```

giac [A] time = 0.46, size = 127, normalized size = 1.57

$$-\frac{\sqrt{\pi}\,\mathrm{erf}\left(-\sqrt{-b\log(F)}\,d\left(x+\frac{c}{d}\right)\right)e^{\left(a\log(F)+1\right)}}{2\sqrt{-b\log(F)}\,d}+\frac{\frac{\sqrt{\pi}\,F^a cf\,\mathrm{erf}\left(-\sqrt{-b\log(F)}\,d\left(x+\frac{c}{d}\right)\right)}{\sqrt{-b\log(F)}\,d}+\frac{fe^{\left(bd^2x^2\log(F)+2\,bcdx\log(F)+bc^2\log(F)+a\log(F)\right)}}{bd\log(F)}}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(f*x+e),x, algorithm="giac")
```

```
[Out] -1/2*sqrt(pi)*erf(-sqrt(-b*log(F))*d*(x + c/d))*e^(a*log(F) + 1)/(sqrt(-b*l
og(F))*d) + 1/2*(sqrt(pi)*F^a*c*f*erf(-sqrt(-b*log(F))*d*(x + c/d))/(sqrt(-
b*log(F))*d) + f*e^(b*d^2*x^2*log(F) + 2*b*c*d*x*log(F) + b*c^2*log(F) + a*
log(F))/(b*d*log(F)))/d
```

maple [A] time = 0.07, size = 132, normalized size = 1.63

$$\frac{\sqrt{\pi}\, c f F^{a} \operatorname{erf}\left(\frac{bc\ln(F)}{\sqrt{-b\ln(F)}} - \sqrt{-b\ln(F)}\, dx\right)}{2\sqrt{-b\ln(F)}\, d^{2}} - \frac{\sqrt{\pi}\, e F^{a} \operatorname{erf}\left(\frac{bc\ln(F)}{\sqrt{-b\ln(F)}} - \sqrt{-b\ln(F)}\, dx\right)}{2\sqrt{-b\ln(F)}\, d} + \frac{f F^{a} F^{bc^{2}} F^{bd^{2}x^{2}} F^{2bcdx}}{2b d^{2}\ln(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+(d*x+c)^2*b)*(f*x+e),x)
```

```
[Out] -1/2*e*Pi^(1/2)*F^a/d/(-b*ln(F))^(1/2)*erf(1/(-b*ln(F))^(1/2)*b*c*ln(F)-(-b
*ln(F))^(1/2)*d*x)+1/2*f/ln(F)/b/d^2*F^(b*d^2*x^2)*F^(2*b*c*d*x)*F^(b*c^2)*
F^a+1/2*f*c/d^2*Pi^(1/2)*F^a/(-b*ln(F))^(1/2)*erf(1/(-b*ln(F))^(1/2)*b*c*ln
(F)-(-b*ln(F))^(1/2)*d*x)
```

maxima [B] time = 1.76, size = 195, normalized size = 2.41

$$-\frac{\left(\frac{\sqrt{\pi}\left(bd^{2}x+bcd\right)bc\left(\operatorname{erf}\left(\sqrt{-\frac{\left(bd^{2}x+bcd\right)^{2}\log(F)}{bd^{2}}}\right)-1\right)\log(F)^{2}}{\left(b\log(F)\right)^{\frac{3}{2}}d^{2}\sqrt{-\frac{\left(bd^{2}x+bcd\right)^{2}\log(F)}{bd^{2}}}} - \frac{F^{\frac{\left(bd^{2}x+bcd\right)^{2}}{bd^{2}}}b\log(F)}{\left(b\log(F)\right)^{\frac{3}{2}}d}\right)F^{a}f}{2\sqrt{b\log(F)}\,d} + \frac{\sqrt{\pi}\,F^{bc^{2}+a}e\operatorname{erf}\left(\sqrt{-b\log(F)}\,dx - \frac{bc\log(F)}{\sqrt{-b\log(F)}}\right)}{2\sqrt{-b\log(F)}\,F^{bc^{2}}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)*(f*x+e),x, algorithm="maxima")
```

```
[Out] -1/2*(sqrt(pi)*(b*d^2*x + b*c*d)*b*c*(erf(sqrt(-(b*d^2*x + b*c*d)^2*log(F)/
(b*d^2))) - 1)*log(F)^2/((b*log(F))^(3/2)*d^2*sqrt(-(b*d^2*x + b*c*d)^2*log
(F)/(b*d^2))) - F^((b*d^2*x + b*c*d)^2/(b*d^2))*b*log(F)/((b*log(F))^(3/2)*
d))*F^a*f/(sqrt(b*log(F))*d) + 1/2*sqrt(pi)*F^(b*c^2 + a)*e*erf(sqrt(-b*log
(F))*d*x - b*c*log(F)/sqrt(-b*log(F)))/(sqrt(-b*log(F))*F^(b*c^2)*d)
```

mupad [B] time = 3.63, size = 96, normalized size = 1.19

$$\frac{F^{b\,d^{2}\,x^{2}}\,F^{a}\,F^{b\,c^{2}}\,F^{2\,b\,c\,d\,x}\,f}{2\,b\,d^{2}\,\ln(F)} - \frac{F^{a}\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b\,x\,\ln(F)\,d^{2}+b\,c\,\ln(F)\,d}{\sqrt{b\,d^{2}\,\ln(F)}}\right)\left(c\,f-d\,e\right)}{2\,d\,\sqrt{b\,d^{2}\,\ln(F)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)*(e + f*x),x)
```

```
[Out] (F^(b*d^2*x^2)*F^a*F^(b*c^2)*F^(2*b*c*d*x)*f)/(2*b*d^2*log(F)) - (F^a*pi^(1
/2)*erfi((b*c*d*log(F) + b*d^2*x*log(F))/(b*d^2*log(F))^(1/2))*(c*f - d*e))
/(2*d*(b*d^2*log(F))^(1/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+b(c+dx)^2}\left(e+fx\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)*(f*x+e),x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**2)*(e + f*x), x)
```

3.387 $\int F^{a+b(c+dx)^2}\,dx$

Optimal. Leaf size=44

$$\frac{\sqrt{\pi}F^a\text{erfi}\left(\sqrt{b}\sqrt{\log(F)}(c+dx)\right)}{2\sqrt{b}\,d\sqrt{\log(F)}}$$

```
[Out] 1/2*F^a*erfi((d*x+c)*b^(1/2)*ln(F)^(1/2))*Pi^(1/2)/d/b^(1/2)/ln(F)^(1/2)
```

Rubi [A] time = 0.01, antiderivative size = 44, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2204}

$$\frac{\sqrt{\pi}F^a\text{Erfi}\left(\sqrt{b}\sqrt{\log(F)}(c+dx)\right)}{2\sqrt{b}\,d\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*(c + d*x)^2),x]
```

```
[Out] (F^a*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]])/(2*Sqrt[b]*d*Sqrt[Log[F
]])
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rubi steps

$$\int F^{a+b(c+dx)^2}\,dx=\frac{F^a\sqrt{\pi}\,\text{erfi}\left(\sqrt{b}(c+dx)\sqrt{\log(F)}\right)}{2\sqrt{b}\,d\sqrt{\log(F)}}$$

Mathematica [A] time = 0.01, size = 44, normalized size = 1.00

$$\frac{\sqrt{\pi}F^a\text{erfi}\left(\sqrt{b}\sqrt{\log(F)}(c+dx)\right)}{2\sqrt{b}\,d\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*(c + d*x)^2),x]
```

```
[Out] (F^a*Sqrt[Pi]*Erfi[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]])/(2*Sqrt[b]*d*Sqrt[Log[F
]])
```

fricas [A] time = 0.47, size = 48, normalized size = 1.09

$$-\frac{\sqrt{\pi}\sqrt{-bd^2\log(F)}\,F^a\operatorname{erf}\left(\frac{\sqrt{-bd^2\log(F)}\,(dx+c)}{d}\right)}{2\,bd^2\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2),x, algorithm="fricas")
```

```
[Out] -1/2*sqrt(pi)*sqrt(-b*d^2*log(F))*F^a*erf(sqrt(-b*d^2*log(F))*(d*x + c)/d)/
(b*d^2*log(F))
```

giac [A] time = 0.42, size = 36, normalized size = 0.82

$$-\frac{\sqrt{\pi}\,F^a\operatorname{erf}\left(-\sqrt{-b\log(F)}\,d\left(x+\frac{c}{d}\right)\right)}{2\sqrt{-b\log(F)}\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2),x, algorithm="giac")
```

```
[Out] -1/2*sqrt(pi)*F^a*erf(-sqrt(-b*log(F))*d*(x + c/d))/(sqrt(-b*log(F))*d)
```

maple [A] time = 0.02, size = 58, normalized size = 1.32

$$-\frac{\sqrt{\pi}\,F^{-b\,c^2}F^{b\,c^2+a}\operatorname{erf}\left(\frac{bc\ln(F)}{\sqrt{-b\ln(F)}}-\sqrt{-b\ln(F)}\,dx\right)}{2\sqrt{-b\ln(F)}\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+(d*x+c)^2*b),x)
```

```
[Out] -1/2*Pi^(1/2)*F^(b*c^2+a)*F^(-b*c^2)/d/(-b*ln(F))^(1/2)*erf(1/(-b*ln(F))^(1
/2)*b*c*ln(F)-(-b*ln(F))^(1/2)*d*x)
```

maxima [A] time = 0.97, size = 58, normalized size = 1.32

$$\frac{\sqrt{\pi}\,F^{bc^2+a}\operatorname{erf}\left(\sqrt{-b\log(F)}\,dx-\frac{bc\log(F)}{\sqrt{-b\log(F)}}\right)}{2\sqrt{-b\log(F)}\,F^{bc^2}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2),x, algorithm="maxima")
```

```
[Out] 1/2*sqrt(pi)*F^(b*c^2 + a)*erf(sqrt(-b*log(F))*d*x - b*c*log(F)/sqrt(-b*log
(F)))/(sqrt(-b*log(F))*F^(b*c^2)*d)
```

mupad [B] time = 3.40, size = 48, normalized size = 1.09

$$-\frac{F^a\sqrt{\pi}\,\mathrm{erf}\left(\frac{1\mathrm{i}\,b\,x\,\ln(F)\,d^2+1\mathrm{i}\,b\,c\,\ln(F)\,d}{\sqrt{b\,d^2\,\ln(F)}}\right)\,1\mathrm{i}}{2\,\sqrt{b\,d^2\,\ln(F)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2),x)
```

```
[Out] -(F^a*pi^(1/2)*erf((b*c*d*log(F)*1i + b*d^2*x*log(F)*1i)/(b*d^2*log(F))^(1/
2))*1i)/(2*(b*d^2*log(F))^(1/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{a+b(c+dx)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2),x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**2), x)
```

3.388 $\int \frac{F^{a+b(c+dx)^2}}{e+fx}\,dx$

Optimal. Leaf size=24

$$\text{Int}\left(\frac{F^{a+b(c+dx)^2}}{e+fx},x\right)$$

```
[Out] Unintegrable(F^(a+b*(d*x+c)^2)/(f*x+e),x)
```

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{F^{a+b(c+dx)^2}}{e+fx}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[F^(a + b*(c + d*x)^2)/(e + f*x),x]
```

```
[Out] Defer[Int][F^(a + b*(c + d*x)^2)/(e + f*x), x]
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^2}}{e+fx}\,dx = \int \frac{F^{a+b(c+dx)^2}}{e+fx}\,dx$$

Mathematica [A] time = 0.29, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b(c+dx)^2}}{e+fx}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[F^(a + b*(c + d*x)^2)/(e + f*x),x]
```

```
[Out] Integrate[F^(a + b*(c + d*x)^2)/(e + f*x), x]
```

fricas [A] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{F^{bd^2x^2+2\,bcdx+bc^2+a}}{fx+e},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(f*x+e),x, algorithm="fricas")
[Out] integral(F^(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a)/(f*x + e), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^2b+a}}{fx+e}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(f*x+e),x, algorithm="giac")
[Out] integrate(F^((d*x + c)^2*b + a)/(f*x + e), x)
```

maple [A] time = 0.10, size = 0, normalized size = 0.00

$$\int \frac{F^{a+(dx+c)^2b}}{fx+e}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+(d*x+c)^2*b)/(f*x+e),x)
[Out] int(F^(a+(d*x+c)^2*b)/(f*x+e),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^2b+a}}{fx+e}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(f*x+e),x, algorithm="maxima")
[Out] integrate(F^((d*x + c)^2*b + a)/(f*x + e), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{F^{a+b\,(c+d\,x)^2}}{e+f\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)/(e + f*x),x)
[Out] int(F^(a + b*(c + d*x)^2)/(e + f*x), x)
```

<u>**sympy**</u> **[A]** time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b(c+dx)^2}}{e+fx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)/(f*x+e),x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**2)/(e + f*x), x)
```

3.389 $\int \frac{F^{a+b(c+dx)^2}}{(e+fx)^2}\,dx$

Optimal. Leaf size=109

$$-\frac{2bd\log(F)(de-cf)\text{Int}\left(\frac{F^{a+b(c+dx)^2}}{e+fx},x\right)}{f^2}-\frac{F^{a+b(c+dx)^2}}{f(e+fx)}+\frac{\sqrt{\pi}\sqrt{b}\,dF^a\sqrt{\log(F)}\,\text{erfi}\left(\sqrt{b}\sqrt{\log(F)}\,(c+dx)\right)}{f^2}$$

```
[Out] -F^(a+b*(d*x+c)^2)/f/(f*x+e)+d*F^a*erfi((d*x+c)*b^(1/2)*ln(F)^(1/2))*b^(1/2
)*Pi^(1/2)*ln(F)^(1/2)/f^2-2*b*d*(-c*f+d*e)*ln(F)*Unintegrable(F^(a+b*(d*x+
c)^2)/(f*x+e),x)/f^2
```

Rubi [A] time = 0.16, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{F^{a+b(c+dx)^2}}{(e+fx)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[F^(a + b*(c + d*x)^2)/(e + f*x)^2,x]
```

```
[Out] -(F^(a + b*(c + d*x)^2)/(f*(e + f*x))) + (Sqrt[b]*d*F^a*Sqrt[Pi]*Erfi[Sqrt[
b]*(c + d*x)*Sqrt[Log[F]]]*Sqrt[Log[F]])/f^2 - (2*b*d*(d*e - c*f)*Log[F]*De
fer[Int][F^(a + b*(c + d*x)^2)/(e + f*x), x])/f^2
```

Rubi steps

$$\begin{aligned}\int \frac{F^{a+b(c+dx)^2}}{(e+fx)^2}\,dx &= -\frac{F^{a+b(c+dx)^2}}{f(e+fx)}+\frac{\left(2bd^2\log(F)\right)\int F^{a+b(c+dx)^2}\,dx}{f^2}-\frac{(2bd(de-cf)\log(F))\int \frac{F^{a+b(c+dx)^2}}{e+fx}\,dx}{f^2}\\ &= -\frac{F^{a+b(c+dx)^2}}{f(e+fx)}+\frac{\sqrt{b}\,dF^a\sqrt{\pi}\,\text{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log(F)}\right)\sqrt{\log(F)}}{f^2}-\frac{(2bd(de-cf)\log(F))\int \frac{F^{a+b(}}{e+}}{f^2}\end{aligned}$$

Mathematica [A] time = 0.78, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b(c+dx)^2}}{(e+fx)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[F^(a + b*(c + d*x)^2)/(e + f*x)^2,x]
```

```
[Out] Integrate[F^(a + b*(c + d*x)^2)/(e + f*x)^2, x]
```

fricas [A] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{F^{bd^2x^2+2\,bcdx+bc^2+a}}{f^2x^2+2\,efx+e^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(f*x+e)^2,x, algorithm="fricas")
```

```
[Out] integral(F^(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a)/(f^2*x^2 + 2*e*f*x + e^2), x
)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^2b+a}}{(fx+e)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(f*x+e)^2,x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^2*b + a)/(f*x + e)^2, x)
```

maple [A] time = 0.10, size = 0, normalized size = 0.00

$$\int \frac{F^{a+(dx+c)^2b}}{(fx+e)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+(d*x+c)^2*b)/(f*x+e)^2,x)
```

```
[Out] int(F^(a+(d*x+c)^2*b)/(f*x+e)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^2b+a}}{(fx+e)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(f*x+e)^2,x, algorithm="maxima")
```

```
[Out] integrate(F^((d*x + c)^2*b + a)/(f*x + e)^2, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{F^{a+b\,(c+d\,x)^2}}{\left(e+f\,x\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)/(e + f*x)^2,x)
```

```
[Out] int(F^(a + b*(c + d*x)^2)/(e + f*x)^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b(c+dx)^2}}{\left(e+fx\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)/(f*x+e)**2,x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**2)/(e + f*x)**2, x)
```

3.390 $\int \frac{F^{a+b(c+dx)^2}}{(e+fx)^3}\,dx$

Optimal. Leaf size=200

$$\frac{2b^2d^2\log^2(F)(de-cf)^2\text{Int}\left(\frac{F^{a+b(c+dx)^2}}{e+fx},x\right)}{f^4}+\frac{bd^2\log(F)\text{Int}\left(\frac{F^{a+b(c+dx)^2}}{e+fx},x\right)}{f^2}-\frac{\sqrt{\pi}\,b^{3/2}d^2F^a\log^{\frac{3}{2}}(F)(de-cf)\text{erfi}\left(\sqrt{b}\right.}{f^4}$$

```
[Out] -1/2*F^(a+b*(d*x+c)^2)/f/(f*x+e)^2+b*d*(-c*f+d*e)*F^(a+b*(d*x+c)^2)*ln(F)/f
^3/(f*x+e)-b^(3/2)*d^2*(-c*f+d*e)*F^a*erfi((d*x+c)*b^(1/2)*ln(F)^(1/2))*ln(
F)^(3/2)*Pi^(1/2)/f^4+b*d^2*ln(F)*Unintegrable(F^(a+b*(d*x+c)^2)/(f*x+e),x)
/f^2+2*b^2*d^2*(-c*f+d*e)^2*ln(F)^2*Unintegrable(F^(a+b*(d*x+c)^2)/(f*x+e),
x)/f^4
```

Rubi [A] time = 0.31, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{F^{a+b(c+dx)^2}}{(e+fx)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[F^(a + b*(c + d*x)^2)/(e + f*x)^3,x]
```

```
[Out] -F^(a + b*(c + d*x)^2)/(2*f*(e + f*x)^2) + (b*d*(d*e - c*f)*F^(a + b*(c + d
*x)^2)*Log[F])/(f^3*(e + f*x)) - (b^(3/2)*d^2*(d*e - c*f)*F^a*Sqrt[Pi]*Erfi
[Sqrt[b]*(c + d*x)*Sqrt[Log[F]]]*Log[F]^(3/2))/f^4 + (b*d^2*Log[F]*Defer[In
t][F^(a + b*(c + d*x)^2)/(e + f*x), x])/f^2 + (2*b^2*d^2*(d*e - c*f)^2*Log[
F]^2*Defer[Int][F^(a + b*(c + d*x)^2)/(e + f*x), x])/f^4
```

Rubi steps

$$\int \frac{F^{a+b(c+dx)^2}}{(e+fx)^3}\,dx=-\frac{F^{a+b(c+dx)^2}}{2f(e+fx)^2}+\frac{\left(bd^2\log(F)\right)\int \frac{F^{a+b(c+dx)^2}}{e+fx}\,dx}{f^2}-\frac{(bd(de-cf)\log(F))\int \frac{F^{a+b(c+dx)^2}}{(e+fx)^2}\,dx}{f^2}$$

$$=-\frac{F^{a+b(c+dx)^2}}{2f(e+fx)^2}+\frac{bd(de-cf)F^{a+b(c+dx)^2}\log(F)}{f^3(e+fx)}+\frac{\left(bd^2\log(F)\right)\int \frac{F^{a+b(c+dx)^2}}{e+fx}\,dx}{f^2}-\frac{\left(2b^2d^3(de-c\right.}{}$$

$$=-\frac{F^{a+b(c+dx)^2}}{2f(e+fx)^2}+\frac{bd(de-cf)F^{a+b(c+dx)^2}\log(F)}{f^3(e+fx)}-\frac{b^{3/2}d^2(de-cf)F^a\sqrt{\pi}\,\text{erfi}\left(\sqrt{b}\,(c+dx)\sqrt{\log\right.}{f^4}$$

Mathematica [A] time = 1.16, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b(c+dx)^2}}{(e+fx)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[F^(a + b*(c + d*x)^2)/(e + f*x)^3,x]
```

```
[Out] Integrate[F^(a + b*(c + d*x)^2)/(e + f*x)^3, x]
```

fricas [A] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{F^{bd^2x^2+2\,bcdx+bc^2+a}}{f^3x^3+3\,ef^2x^2+3\,e^2fx+e^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(f*x+e)^3,x, algorithm="fricas")
```

```
[Out] integral(F^(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a)/(f^3*x^3 + 3*e*f^2*x^2 + 3*e
^2*f*x + e^3), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^2b+a}}{\left(fx+e\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(f*x+e)^3,x, algorithm="giac")
```

```
[Out] integrate(F^((d*x + c)^2*b + a)/(f*x + e)^3, x)
```

maple [A] time = 0.10, size = 0, normalized size = 0.00

$$\int \frac{F^{a+(dx+c)^2b}}{\left(fx+e\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+(d*x+c)^2*b)/(f*x+e)^3,x)
```

```
[Out] int(F^(a+(d*x+c)^2*b)/(f*x+e)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{(dx+c)^2b+a}}{\left(fx+e\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*(d*x+c)^2)/(f*x+e)^3,x, algorithm="maxima")
```

```
[Out] integrate(F^((d*x + c)^2*b + a)/(f*x + e)^3, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{F^{a+b\,(c+d\,x)^2}}{\left(e+f\,x\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*(c + d*x)^2)/(e + f*x)^3,x)
```

```
[Out] int(F^(a + b*(c + d*x)^2)/(e + f*x)^3, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b(c+dx)^2}}{\left(e+fx\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*(d*x+c)**2)/(f*x+e)**3,x)
```

```
[Out] Integral(F**(a + b*(c + d*x)**2)/(e + f*x)**3, x)
```

3.391 $\int e^{e(c+dx)^3}(a+bx)^3\,dx$

Optimal. Leaf size=177

$$-\frac{b^2(bc-ad)e^{e(c+dx)^3}}{d^4e}-\frac{b(c+dx)^2(bc-ad)^2\Gamma\left(\frac{2}{3},-e(c+dx)^3\right)}{d^4\left(-e(c+dx)^3\right)^{2/3}}+\frac{(c+dx)(bc-ad)^3\Gamma\left(\frac{1}{3},-e(c+dx)^3\right)}{3d^4\sqrt[3]{-e(c+dx)^3}}-\frac{b^3(c+dx)^4\Gamma}{3d^4\left(-e(\right.}$$

```
[Out] -b^2*(-a*d+b*c)*exp(e*(d*x+c)^3)/d^4/e+1/3*(-a*d+b*c)^3*(d*x+c)*GAMMA(1/3,-
e*(d*x+c)^3)/d^4/(-e*(d*x+c)^3)^(1/3)-b*(-a*d+b*c)^2*(d*x+c)^2*GAMMA(2/3,-e
*(d*x+c)^3)/d^4/(-e*(d*x+c)^3)^(2/3)-1/3*b^3*(d*x+c)^4*GAMMA(4/3,-e*(d*x+c)
^3)/d^4/(-e*(d*x+c)^3)^(4/3)
```

Rubi [A] time = 0.16, antiderivative size = 177, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.210, Rules used = {2226, 2208, 2218, 2209}

$$-\frac{b(c+dx)^2(bc-ad)^2\text{Gamma}\left(\frac{2}{3},-e(c+dx)^3\right)}{d^4\left(-e(c+dx)^3\right)^{2/3}}+\frac{(c+dx)(bc-ad)^3\text{Gamma}\left(\frac{1}{3},-e(c+dx)^3\right)}{3d^4\sqrt[3]{-e(c+dx)^3}}-\frac{b^3(c+dx)^4\text{Gamm}}{3d^4\left(-e(c\right.}$$

Antiderivative was successfully verified.

```
[In] Int[E^(e*(c + d*x)^3)*(a + b*x)^3,x]
```

```
[Out] -((b^2*(b*c - a*d)*E^(e*(c + d*x)^3))/(d^4*e)) + ((b*c - a*d)^3*(c + d*x)*G
amma[1/3, -(e*(c + d*x)^3)])/(3*d^4*(-(e*(c + d*x)^3))^(1/3)) - (b*(b*c - a
*d)^2*(c + d*x)^2*Gamma[2/3, -(e*(c + d*x)^3)])/(d^4*(-(e*(c + d*x)^3))^(2/
3)) - (b^3*(c + d*x)^4*Gamma[4/3, -(e*(c + d*x)^3)])/(3*d^4*(-(e*(c + d*x)^
3))^(4/3))
```

Rule 2208

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> -Simp[(F^a
*(c + d*x)*Gamma[1/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x)^n*Log[F
]))^(1/n)), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2226

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int e^{e(c+dx)^3}(a+bx)^3\,dx = \int \left(\frac{(-bc+ad)^3e^{e(c+dx)^3}}{d^3} + \frac{3b(bc-ad)^2e^{e(c+dx)^3}(c+dx)}{d^3} - \frac{3b^2(bc-ad)e^{e(c+dx)^3}(c+dx)^2}{d^3}\right.$$

$$= \frac{b^3\int e^{e(c+dx)^3}(c+dx)^3\,dx}{d^3} - \frac{\left(3b^2(bc-ad)\right)\int e^{e(c+dx)^3}(c+dx)^2\,dx}{d^3} + \frac{\left(3b(bc-ad)^2\right)\int e^{e}}{d^3}$$

$$= -\frac{b^2(bc-ad)e^{e(c+dx)^3}}{d^4e} + \frac{(bc-ad)^3(c+dx)\Gamma\left(\frac{1}{3},-e(c+dx)^3\right)}{3d^4\sqrt[3]{-e(c+dx)^3}} - \frac{b(bc-ad)^2(c+dx)^2\Gamma\left(\right.}{d^4\left(-e(c+dx\right.}$$

Mathematica [A] time = 0.20, size = 167, normalized size = 0.94

$$\frac{-\frac{3b^2(bc-ad)e^{e(c+dx)^3}}{e} - \frac{3b(c+dx)^2(bc-ad)^2\Gamma\left(\frac{2}{3},-e(c+dx)^3\right)}{\left(-e(c+dx)^3\right)^{2/3}} + \frac{(c+dx)(bc-ad)^3\Gamma\left(\frac{1}{3},-e(c+dx)^3\right)}{\sqrt[3]{-e(c+dx)^3}} + \frac{b^3(c+dx)\Gamma\left(\frac{4}{3},-e(c+dx)^3\right)}{e\sqrt[3]{-e(c+dx)^3}}}{3d^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(e*(c + d*x)^3)*(a + b*x)^3,x]
```

```
[Out] ((-3*b^2*(b*c - a*d)*E^(e*(c + d*x)^3))/e + ((b*c - a*d)^3*(c + d*x)*Gamma[
1/3, -(e*(c + d*x)^3)])/(-(e*(c + d*x)^3))^(1/3) - (3*b*(b*c - a*d)^2*(c +
d*x)^2*Gamma[2/3, -(e*(c + d*x)^3)])/(-(e*(c + d*x)^3))^(2/3) + (b^3*(c + d
*x)*Gamma[4/3, -(e*(c + d*x)^3)])/(e*(-(e*(c + d*x)^3))^(1/3)))/(3*d^4)
```

fricas [A] time = 0.45, size = 239, normalized size = 1.35

$$9\left(b^3c^2d - 2\,ab^2cd^2 + a^2bd^3\right)\left(-d^3e\right)^{\frac{1}{3}}e\Gamma\left(\frac{2}{3}, -d^3ex^3 - 3\,cd^2ex^2 - 3\,c^2dex - c^3e\right) - \left(-d^3e\right)^{\frac{2}{3}}\left(b^3 + 3\left(b^3c^3 - 3\,ab^2c^2\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*(d*x+c)^3)*(b*x+a)^3,x, algorithm="fricas")
```

```
[Out] 1/9*(9*(b^3*c^2*d - 2*a*b^2*c*d^2 + a^2*b*d^3)*(-d^3*e)^(1/3)*e*gamma(2/3,
-d^3*e*x^3 - 3*c*d^2*e*x^2 - 3*c^2*d*e*x - c^3*e) - (-d^3*e)^(2/3)*(b^3 + 3
*(b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*e)*gamma(1/3, -d^3*e*x
^3 - 3*c*d^2*e*x^2 - 3*c^2*d*e*x - c^3*e) + 3*(b^3*d^3*e*x - (2*b^3*c*d^2 -
 3*a*b^2*d^3)*e)*e^(d^3*e*x^3 + 3*c*d^2*e*x^2 + 3*c^2*d*e*x + c^3*e))/(d^6*
e^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (bx+a)^3 e^{\left((dx+c)^3 e\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*(d*x+c)^3)*(b*x+a)^3,x, algorithm="giac")
```

```
[Out] integrate((b*x + a)^3*e^((d*x + c)^3*e), x)
```

maple [F] time = 0.10, size = 0, normalized size = 0.00

$$\int (bx+a)^3 \, \mathrm{e}^{(dx+c)^3 e}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e*(d*x+c)^3)*(b*x+a)^3,x)
```

```
[Out] int(exp(e*(d*x+c)^3)*(b*x+a)^3,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (bx+a)^3 e^{\left((dx+c)^3 e\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*(d*x+c)^3)*(b*x+a)^3,x, algorithm="maxima")
```

```
[Out] integrate((b*x + a)^3*e^((d*x + c)^3*e), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \mathrm{e}^{e\,(c+d\,x)^3}\,(a+b\,x)^3 \,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e*(c + d*x)^3)*(a + b*x)^3,x)
```

```
[Out] int(exp(e*(c + d*x)^3)*(a + b*x)^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*(d*x+c)**3)*(b*x+a)**3,x)
```

```
[Out] Timed out
```

3.392 $\int e^{e(c+dx)^3}(a+bx)^2\,dx$

Optimal. Leaf size=126

$$\frac{2b(c+dx)^2(bc-ad)\Gamma\left(\frac{2}{3},-e(c+dx)^3\right)}{3d^3\left(-e(c+dx)^3\right)^{2/3}}-\frac{(c+dx)(bc-ad)^2\Gamma\left(\frac{1}{3},-e(c+dx)^3\right)}{3d^3\sqrt[3]{-e(c+dx)^3}}+\frac{b^2e^{e(c+dx)^3}}{3d^3e}$$

```
[Out] 1/3*b^2*exp(e*(d*x+c)^3)/d^3/e-1/3*(-a*d+b*c)^2*(d*x+c)*GAMMA(1/3,-e*(d*x+c
)^3)/d^3/(-e*(d*x+c)^3)^(1/3)+2/3*b*(-a*d+b*c)*(d*x+c)^2*GAMMA(2/3,-e*(d*x+
c)^3)/d^3/(-e*(d*x+c)^3)^(2/3)
```

Rubi [A] time = 0.11, antiderivative size = 126, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.210, Rules used = {2226, 2208, 2218, 2209}

$$\frac{2b(c+dx)^2(bc-ad)\text{Gamma}\left(\frac{2}{3},-e(c+dx)^3\right)}{3d^3\left(-e(c+dx)^3\right)^{2/3}}-\frac{(c+dx)(bc-ad)^2\text{Gamma}\left(\frac{1}{3},-e(c+dx)^3\right)}{3d^3\sqrt[3]{-e(c+dx)^3}}+\frac{b^2e^{e(c+dx)^3}}{3d^3e}$$

Antiderivative was successfully verified.

```
[In] Int[E^(e*(c + d*x)^3)*(a + b*x)^2,x]
```

```
[Out] (b^2*E^(e*(c + d*x)^3))/(3*d^3*e) - ((b*c - a*d)^2*(c + d*x)*Gamma[1/3, -(e
*(c + d*x)^3)])/(3*d^3*(-(e*(c + d*x)^3))^(1/3)) + (2*b*(b*c - a*d)*(c + d*
x)^2*Gamma[2/3, -(e*(c + d*x)^3)])/(3*d^3*(-(e*(c + d*x)^3))^(2/3))
```

Rule 2208

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> -Simp[(F^a
*(c + d*x)*Gamma[1/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x)^n*Log[F
]))^(1/n)), x] /; FreeQ[{F, a, b, c, d, n}, x] && !IntegerQ[2/n]
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
```

```
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2226

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int e^{e(c+dx)^3}(a+bx)^2\,dx = \int\left(\frac{(-bc+ad)^2e^{e(c+dx)^3}}{d^2}-\frac{2b(bc-ad)e^{e(c+dx)^3}(c+dx)}{d^2}+\frac{b^2e^{e(c+dx)^3}(c+dx)^2}{d^2}\right)dx$$
$$=\frac{b^2\int e^{e(c+dx)^3}(c+dx)^2\,dx}{d^2}-\frac{(2b(bc-ad))\int e^{e(c+dx)^3}(c+dx)\,dx}{d^2}+\frac{(bc-ad)^2\int e^{e(c+dx)^3}\,c}{d^2}$$
$$=\frac{b^2e^{e(c+dx)^3}}{3d^3e}-\frac{(bc-ad)^2(c+dx)\Gamma\left(\frac{1}{3},-e(c+dx)^3\right)}{3d^3\sqrt[3]{-e(c+dx)^3}}+\frac{2b(bc-ad)(c+dx)^2\Gamma\left(\frac{2}{3},-e(c+d\right.}{3d^3\left(-e(c+dx)^3\right)^{2/3}}$$

Mathematica [A] time = 0.08, size = 117, normalized size = 0.93

$$\frac{\frac{2b(c+dx)^2(bc-ad)\Gamma\left(\frac{2}{3},-e(c+dx)^3\right)}{\left(-e(c+dx)^3\right)^{2/3}}-\frac{(c+dx)(bc-ad)^2\Gamma\left(\frac{1}{3},-e(c+dx)^3\right)}{\sqrt[3]{-e(c+dx)^3}}+\frac{b^2e^{e(c+dx)^3}}{e}}{3d^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(e*(c + d*x)^3)*(a + b*x)^2,x]
```

```
[Out] ((b^2*E^(e*(c + d*x)^3))/e - ((b*c - a*d)^2*(c + d*x)*Gamma[1/3, -(e*(c + d
*x)^3)])/(-(e*(c + d*x)^3))^(1/3) + (2*b*(b*c - a*d)*(c + d*x)^2*Gamma[2/3,
 -(e*(c + d*x)^3)])/(-(e*(c + d*x)^3))^(2/3))/(3*d^3)
```

fricas [A] time = 0.44, size = 175, normalized size = 1.39

$$\frac{b^2d^2e^{\left(d^3ex^3+3\,cd^2ex^2+3\,c^2dex+c^3e\right)}+\left(b^2c^2-2\,abcd+a^2d^2\right)\left(-d^3e\right)^{\frac{2}{3}}\Gamma\left(\frac{1}{3},-d^3ex^3-3\,cd^2ex^2-3\,c^2dex-c^3e\right)-2\left(b^2cc\right.}{3\,d^5e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*(d*x+c)^3)*(b*x+a)^2,x, algorithm="fricas")
```

```
[Out] 1/3*(b^2*d^2*e^(d^3*e*x^3 + 3*c*d^2*e*x^2 + 3*c^2*d*e*x + c^3*e) + (b^2*c^2
 - 2*a*b*c*d + a^2*d^2)*(-d^3*e)^(2/3)*gamma(1/3, -d^3*e*x^3 - 3*c*d^2*e*x^
2 - 3*c^2*d*e*x - c^3*e) - 2*(b^2*c*d - a*b*d^2)*(-d^3*e)^(1/3)*gamma(2/3,
-d^3*e*x^3 - 3*c*d^2*e*x^2 - 3*c^2*d*e*x - c^3*e))/(d^5*e)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (bx+a)^2 e^{\left((dx+c)^3 e\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*(d*x+c)^3)*(b*x+a)^2,x, algorithm="giac")
```

```
[Out] integrate((b*x + a)^2*e^((d*x + c)^3*e), x)
```

maple [F] time = 0.10, size = 0, normalized size = 0.00

$$\int (bx+a)^2\,\mathrm{e}^{(dx+c)^3 e}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp((d*x+c)^3*e)*(b*x+a)^2,x)
```

```
[Out] int(exp((d*x+c)^3*e)*(b*x+a)^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (bx+a)^2 e^{\left((dx+c)^3 e\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*(d*x+c)^3)*(b*x+a)^2,x, algorithm="maxima")
```

```
[Out] integrate((b*x + a)^2*e^((d*x + c)^3*e), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \mathrm{e}^{e\,(c+d\,x)^3}\,(a+b\,x)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e*(c + d*x)^3)*(a + b*x)^2,x)
```

```
[Out] int(exp(e*(c + d*x)^3)*(a + b*x)^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\left(\int a^{2}e^{d^{3}ex^{3}}e^{3cd^{2}ex^{2}}e^{3c^{2}dex}\,dx+\int b^{2}x^{2}e^{d^{3}ex^{3}}e^{3cd^{2}ex^{2}}e^{3c^{2}dex}\,dx+\int 2abxe^{d^{3}ex^{3}}e^{3cd^{2}ex^{2}}e^{3c^{2}dex}\,dx\right)e^{c^{3}e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*(d*x+c)**3)*(b*x+a)**2,x)
```

```
[Out] (Integral(a**2*exp(d**3*e*x**3)*exp(3*c*d**2*e*x**2)*exp(3*c**2*d*e*x), x)
+ Integral(b**2*x**2*exp(d**3*e*x**3)*exp(3*c*d**2*e*x**2)*exp(3*c**2*d*e*x
), x) + Integral(2*a*b*x*exp(d**3*e*x**3)*exp(3*c*d**2*e*x**2)*exp(3*c**2*d
*e*x), x))*exp(c**3*e)
```

3.393 $\int e^{e(c+dx)^3}(a+bx)\,dx$

Optimal. Leaf size=92

$$\frac{(c+dx)(bc-ad)\Gamma\left(\frac{1}{3},-e(c+dx)^3\right)}{3d^2\sqrt[3]{-e(c+dx)^3}}-\frac{b(c+dx)^2\Gamma\left(\frac{2}{3},-e(c+dx)^3\right)}{3d^2\left(-e(c+dx)^3\right)^{2/3}}$$

```
[Out] 1/3*(-a*d+b*c)*(d*x+c)*GAMMA(1/3,-e*(d*x+c)^3)/d^2/(-e*(d*x+c)^3)^(1/3)-1/3
*b*(d*x+c)^2*GAMMA(2/3,-e*(d*x+c)^3)/d^2/(-e*(d*x+c)^3)^(2/3)
```

Rubi [A] time = 0.06, antiderivative size = 92, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.176, Rules used = {2226, 2208, 2218}

$$\frac{(c+dx)(bc-ad)\text{Gamma}\left(\frac{1}{3},-e(c+dx)^3\right)}{3d^2\sqrt[3]{-e(c+dx)^3}}-\frac{b(c+dx)^2\text{Gamma}\left(\frac{2}{3},-e(c+dx)^3\right)}{3d^2\left(-e(c+dx)^3\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In] Int[E^(e*(c + d*x)^3)*(a + b*x),x]
```

```
[Out] ((b*c - a*d)*(c + d*x)*Gamma[1/3, -(e*(c + d*x)^3)])/(3*d^2*(-(e*(c + d*x)^
3))^(1/3)) - (b*(c + d*x)^2*Gamma[2/3, -(e*(c + d*x)^3)])/(3*d^2*(-(e*(c +
d*x)^3))^(2/3))
```

Rule 2208

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> -Simp[(F^a
*(c + d*x)*Gamma[1/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x)^n*Log[F
]))^(1/n)), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2226

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
```

```
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\begin{aligned}\int e^{e(c+dx)^3}(a+bx)\,dx &= \int\left(\frac{(-bc+ad)e^{e(c+dx)^3}}{d}+\frac{be^{e(c+dx)^3}(c+dx)}{d}\right)dx\\ &= \frac{b\int e^{e(c+dx)^3}(c+dx)\,dx}{d}+\frac{(-bc+ad)\int e^{e(c+dx)^3}\,dx}{d}\\ &= \frac{(bc-ad)(c+dx)\Gamma\left(\frac{1}{3},-e(c+dx)^3\right)}{3d^2\sqrt[3]{-e(c+dx)^3}}-\frac{b(c+dx)^2\Gamma\left(\frac{2}{3},-e(c+dx)^3\right)}{3d^2\left(-e(c+dx)^3\right)^{2/3}}\end{aligned}$$

Mathematica [A] time = 0.06, size = 86, normalized size = 0.93

$$-\frac{(c+dx)\left(b(c+dx)\Gamma\left(\frac{2}{3},-e(c+dx)^3\right)-(bc-ad)\sqrt[3]{-e(c+dx)^3}\,\Gamma\left(\frac{1}{3},-e(c+dx)^3\right)\right)}{3d^2\left(-e(c+dx)^3\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(e*(c + d*x)^3)*(a + b*x),x]
```

```
[Out] -1/3*((c + d*x)*(-((b*c - a*d)*(-(e*(c + d*x)^3))^(1/3)*Gamma[1/3, -(e*(c +
 d*x)^3)]) + b*(c + d*x)*Gamma[2/3, -(e*(c + d*x)^3)]))/(d^2*(-(e*(c + d*x)
^3))^(2/3))
```

fricas [A] time = 0.43, size = 110, normalized size = 1.20

$$\frac{\left(-d^3e\right)^{\frac{1}{3}}bd\Gamma\left(\frac{2}{3},-d^3ex^3-3\,cd^2ex^2-3\,c^2dex-c^3e\right)-\left(-d^3e\right)^{\frac{2}{3}}(bc-ad)\Gamma\left(\frac{1}{3},-d^3ex^3-3\,cd^2ex^2-3\,c^2dex-c^3e\right)}{3\,d^4e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*(d*x+c)^3)*(b*x+a),x, algorithm="fricas")
```

```
[Out] 1/3*((-d^3*e)^(1/3)*b*d*gamma(2/3, -d^3*e*x^3 - 3*c*d^2*e*x^2 - 3*c^2*d*e*x
 - c^3*e) - (-d^3*e)^(2/3)*(b*c - a*d)*gamma(1/3, -d^3*e*x^3 - 3*c*d^2*e*x^
2 - 3*c^2*d*e*x - c^3*e))/(d^4*e)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int(bx+a)e^{\left((dx+c)^3e\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*(d*x+c)^3)*(b*x+a),x, algorithm="giac")
```

```
[Out] integrate((b*x + a)*e^((d*x + c)^3*e), x)
```

maple [F] time = 0.05, size = 0, normalized size = 0.00

$$\int (bx+a)\,\mathrm{e}^{(dx+c)^3 e}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp((d*x+c)^3*e)*(b*x+a),x)
```

```
[Out] int(exp((d*x+c)^3*e)*(b*x+a),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (bx+a)e^{\left((dx+c)^3 e\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*(d*x+c)^3)*(b*x+a),x, algorithm="maxima")
```

```
[Out] integrate((b*x + a)*e^((d*x + c)^3*e), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \mathrm{e}^{e\,(c+d\,x)^3}\,(a+b\,x)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e*(c + d*x)^3)*(a + b*x),x)
```

```
[Out] int(exp(e*(c + d*x)^3)*(a + b*x), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\left(\int ae^{d^3ex^3}e^{3cd^2ex^2}e^{3c^2dex}\,dx+\int bxe^{d^3ex^3}e^{3cd^2ex^2}e^{3c^2dex}\,dx\right)e^{c^3e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*(d*x+c)**3)*(b*x+a),x)
```

```
[Out] (Integral(a*exp(d**3*e*x**3)*exp(3*c*d**2*e*x**2)*exp(3*c**2*d*e*x), x) + I
ntegral(b*x*exp(d**3*e*x**3)*exp(3*c*d**2*e*x**2)*exp(3*c**2*d*e*x), x))*ex
p(c**3*e)
```

3.394 $\int e^{e(c+dx)^3}\,dx$

Optimal. Leaf size=40

$$-\frac{(c+dx)\Gamma\left(\frac{1}{3},-e(c+dx)^3\right)}{3d\sqrt[3]{-e(c+dx)^3}}$$

```
[Out] -1/3*(d*x+c)*GAMMA(1/3,-e*(d*x+c)^3)/d/(-e*(d*x+c)^3)^(1/3)
```

Rubi [A] time = 0.01, antiderivative size = 40, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {2208}

$$-\frac{(c+dx)\text{Gamma}\left(\frac{1}{3},-e(c+dx)^3\right)}{3d\sqrt[3]{-e(c+dx)^3}}$$

Antiderivative was successfully verified.

```
[In] Int[E^(e*(c + d*x)^3),x]
```

```
[Out] -((c + d*x)*Gamma[1/3, -(e*(c + d*x)^3)])/(3*d*(-(e*(c + d*x)^3))^(1/3))
```

Rule 2208

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> -Simp[(F^a
*(c + d*x)*Gamma[1/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x)^n*Log[F
]))^(1/n)), x] /; FreeQ[{F, a, b, c, d, n}, x] && !IntegerQ[2/n]
```

Rubi steps

$$\int e^{e(c+dx)^3}\,dx=-\frac{(c+dx)\Gamma\left(\frac{1}{3},-e(c+dx)^3\right)}{3d\sqrt[3]{-e(c+dx)^3}}$$

Mathematica [A] time = 0.01, size = 40, normalized size = 1.00

$$-\frac{(c+dx)\Gamma\left(\frac{1}{3},-e(c+dx)^3\right)}{3d\sqrt[3]{-e(c+dx)^3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(e*(c + d*x)^3),x]
[Out] -1/3*((c + d*x)*Gamma[1/3, -(e*(c + d*x)^3)])/(d*(-(e*(c + d*x)^3))^(1/3))
```

fricas [A] time = 0.43, size = 52, normalized size = 1.30

$$\frac{\left(-d^3e\right)^{\frac{2}{3}}\Gamma\left(\frac{1}{3}, -d^3ex^3 - 3\,cd^2ex^2 - 3\,c^2dex - c^3e\right)}{3\,d^3e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*(d*x+c)^3),x, algorithm="fricas")
[Out] 1/3*(-d^3*e)^(2/3)*gamma(1/3, -d^3*e*x^3 - 3*c*d^2*e*x^2 - 3*c^2*d*e*x - c^
3*e)/(d^3*e)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int e^{\left((dx+c)^3e\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*(d*x+c)^3),x, algorithm="giac")
[Out] integrate(e^((d*x + c)^3*e), x)
```

maple [F] time = 0.03, size = 0, normalized size = 0.00

$$\int \mathrm{e}^{(dx+c)^3e}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp((d*x+c)^3*e),x)
[Out] int(exp((d*x+c)^3*e),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int e^{\left((dx+c)^3e\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*(d*x+c)^3),x, algorithm="maxima")
[Out] integrate(e^((d*x + c)^3*e), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \mathrm{e}^{e\,(c+d\,x)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e*(c + d*x)^3),x)
```

```
[Out] int(exp(e*(c + d*x)^3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$e^{c^3e}\int e^{d^3ex^3}e^{3cd^2ex^2}e^{3c^2dex}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*(d*x+c)**3),x)
```

```
[Out] exp(c**3*e)*Integral(exp(d**3*e*x**3)*exp(3*c*d**2*e*x**2)*exp(3*c**2*d*e*x
), x)
```

3.395 $\int \frac{e^{e(c+dx)^3}}{a+bx}\,dx$

Optimal. Leaf size=22

$$\text{Int}\left(\frac{e^{e(c+dx)^3}}{a+bx},x\right)$$

[Out] Unintegrable(exp(e*(d*x+c)^3)/(b*x+a),x)

Rubi [A] time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{e^{e(c+dx)^3}}{a+bx}\,dx$$

Verification is Not applicable to the result.

[In] Int[E^(e*(c + d*x)^3)/(a + b*x),x]

[Out] Defer[Int][E^(e*(c + d*x)^3)/(a + b*x), x]

Rubi steps

$$\int \frac{e^{e(c+dx)^3}}{a+bx}\,dx=\int \frac{e^{e(c+dx)^3}}{a+bx}\,dx$$

Mathematica [A] time = 0.39, size = 0, normalized size = 0.00

$$\int \frac{e^{e(c+dx)^3}}{a+bx}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[E^(e*(c + d*x)^3)/(a + b*x),x]

[Out] Integrate[E^(e*(c + d*x)^3)/(a + b*x), x]

fricas [A] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{e^{\left(d^3ex^3+3\,cd^2ex^2+3\,c^2dex+c^3e\right)}}{bx+a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*(d*x+c)^3)/(b*x+a),x, algorithm="fricas")
```

```
[Out] integral(e^(d^3*e*x^3 + 3*c*d^2*e*x^2 + 3*c^2*d*e*x + c^3*e)/(b*x + a), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{\left((dx+c)^3 e\right)}}{bx+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*(d*x+c)^3)/(b*x+a),x, algorithm="giac")
```

```
[Out] integrate(e^((d*x + c)^3*e)/(b*x + a), x)
```

maple [A] time = 0.10, size = 0, normalized size = 0.00

$$\int \frac{\mathrm{e}^{(dx+c)^3 e}}{bx+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp((d*x+c)^3*e)/(b*x+a),x)
```

```
[Out] int(exp((d*x+c)^3*e)/(b*x+a),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{\left((dx+c)^3 e\right)}}{bx+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*(d*x+c)^3)/(b*x+a),x, algorithm="maxima")
```

```
[Out] integrate(e^((d*x + c)^3*e)/(b*x + a), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.05

$$\int \frac{\mathrm{e}^{e\,(c+d\,x)^3}}{a+b\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e*(c + d*x)^3)/(a + b*x),x)
```

```
[Out] int(exp(e*(c + d*x)^3)/(a + b*x), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$e^{c^3e}\int \frac{e^{d^3ex^3}e^{3cd^2ex^2}e^{3c^2dex}}{a+bx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*(d*x+c)**3)/(b*x+a),x)
```

```
[Out] exp(c**3*e)*Integral(exp(d**3*e*x**3)*exp(3*c*d**2*e*x**2)*exp(3*c**2*d*e*x
)/(a + b*x), x)
```

3.396 $\int \frac{e^{e(c+dx)^3}}{(a+bx)^2}\,dx$

Optimal. Leaf size=153

$$\frac{3de(bc-ad)^2\text{Int}\left(\frac{e^{e(c+dx)^3}}{a+bx},x\right)}{b^3}-\frac{de(c+dx)(bc-ad)\Gamma\left(\frac{1}{3},-e(c+dx)^3\right)}{b^3\sqrt[3]{-e(c+dx)^3}}-\frac{e^{e(c+dx)^3}}{b(a+bx)}-\frac{de(c+dx)^2\Gamma\left(\frac{2}{3},-e(c+dx)^3\right)}{b^2\left(-e(c+dx)^3\right)^{2/3}}$$

```
[Out] -exp(e*(d*x+c)^3)/b/(b*x+a)-d*(-a*d+b*c)*e*(d*x+c)*GAMMA(1/3,-e*(d*x+c)^3)/
b^3/(-e*(d*x+c)^3)^(1/3)-d*e*(d*x+c)^2*GAMMA(2/3,-e*(d*x+c)^3)/b^2/(-e*(d*x
+c)^3)^(2/3)+3*d*(-a*d+b*c)^2*e*Unintegrable(exp(e*(d*x+c)^3)/(b*x+a),x)/b^
3
```

Rubi [A] time = 0.35, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{e^{e(c+dx)^3}}{(a+bx)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[E^(e*(c + d*x)^3)/(a + b*x)^2,x]
```

```
[Out] -(E^(e*(c + d*x)^3)/(b*(a + b*x))) - (d*(b*c - a*d)*e*(c + d*x)*Gamma[1/3,
-(e*(c + d*x)^3)])/(b^3*(-(e*(c + d*x)^3))^(1/3)) - (d*e*(c + d*x)^2*Gamma[
2/3, -(e*(c + d*x)^3)])/(b^2*(-(e*(c + d*x)^3))^(2/3)) + (3*d*(b*c - a*d)^2
*e*Defer[Int][E^(e*(c + d*x)^3)/(a + b*x), x])/b^3
```

Rubi steps

$$\int \frac{e^{e(c+dx)^3}}{(a+bx)^2}\,dx = -\frac{e^{e(c+dx)^3}}{b(a+bx)} + \frac{(3de)\int \frac{e^{e(c+dx)^3}(c+dx)^2}{a+bx}\,dx}{b}$$
$$= -\frac{e^{e(c+dx)^3}}{b(a+bx)} + \frac{(3de)\int \left(\frac{d(bc-ad)e^{e(c+dx)^3}}{b^2} + \frac{(bc-ad)^2 e^{e(c+dx)^3}}{b^2(a+bx)} + \frac{de^{e(c+dx)^3}(c+dx)}{b}\right)dx}{b}$$
$$= -\frac{e^{e(c+dx)^3}}{b(a+bx)} + \frac{\left(3d^2e\right)\int e^{e(c+dx)^3}(c+dx)\,dx}{b^2} + \frac{\left(3d^2(bc-ad)e\right)\int e^{e(c+dx)^3}\,dx}{b^3} + \frac{\left(3d(bc-ad)^2e\right)\int}{b^3}$$
$$= -\frac{e^{e(c+dx)^3}}{b(a+bx)} - \frac{d(bc-ad)e(c+dx)\Gamma\left(\frac{1}{3},-e(c+dx)^3\right)}{b^3\sqrt[3]{-e(c+dx)^3}} - \frac{de(c+dx)^2\Gamma\left(\frac{2}{3},-e(c+dx)^3\right)}{b^2\left(-e(c+dx)^3\right)^{2/3}} + \frac{\left(3d(bc-\right.}{}$$

Mathematica [A] time = 2.06, size = 0, normalized size = 0.00

$$\int \frac{e^{e(c+dx)^3}}{(a+bx)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[E^(e*(c + d*x)^3)/(a + b*x)^2,x]
```

```
[Out] Integrate[E^(e*(c + d*x)^3)/(a + b*x)^2, x]
```

fricas [A] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{e^{\left(d^3ex^3+3\,cd^2ex^2+3\,c^2dex+c^3e\right)}}{b^2x^2+2\,abx+a^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*(d*x+c)^3)/(b*x+a)^2,x, algorithm="fricas")
```

```
[Out] integral(e^(d^3*e*x^3 + 3*c*d^2*e*x^2 + 3*c^2*d*e*x + c^3*e)/(b^2*x^2 + 2*a
*b*x + a^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$undef$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*(d*x+c)^3)/(b*x+a)^2,x, algorithm="giac")
[Out] undef
```

maple [A] time = 0.10, size = 0, normalized size = 0.00

$$\int \frac{\mathrm{e}^{(dx+c)^3 e}}{(bx+a)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp((d*x+c)^3*e)/(b*x+a)^2,x)
[Out] int(exp((d*x+c)^3*e)/(b*x+a)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{\left((dx+c)^3 e\right)}}{(bx+a)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*(d*x+c)^3)/(b*x+a)^2,x, algorithm="maxima")
[Out] integrate(e^((d*x + c)^3*e)/(b*x + a)^2, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{e}^{e\,(c+d\,x)^3}}{(a+b\,x)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e*(c + d*x)^3)/(a + b*x)^2,x)
[Out] int(exp(e*(c + d*x)^3)/(a + b*x)^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$e^{c^3 e} \int \frac{e^{d^3 e x^3} e^{3cd^2 e x^2} e^{3c^2 dex}}{a^2 + 2abx + b^2 x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*(d*x+c)**3)/(b*x+a)**2,x)
[Out] exp(c**3*e)*Integral(exp(d**3*e*x**3)*exp(3*c*d**2*e*x**2)*exp(3*c**2*d*e*x
)/(a**2 + 2*a*b*x + b**2*x**2), x)
```

3.397 $\int \frac{F^{a+\frac{b}{c+dx}}}{e+fx} dx$

Optimal. Leaf size=71

$$\frac{F^{a-\frac{bf}{de-cf}}\text{Ei}\left(\frac{bd(e+fx)\log(F)}{(de-cf)(c+dx)}\right)}{f}-\frac{F^a\text{Ei}\left(\frac{b\log(F)}{c+dx}\right)}{f}$$

```
[Out] -F^a*Ei(b*ln(F)/(d*x+c))/f+F^(a-b*f/(-c*f+d*e))*Ei(b*d*(f*x+e)*ln(F)/(-c*f+
d*e)/(d*x+c))/f
```

Rubi [A] time = 0.41, antiderivative size = 71, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {2222, 2210, 2228, 2178}

$$\frac{F^{a-\frac{bf}{de-cf}}\text{Ei}\left(\frac{bd(e+fx)\log(F)}{(de-cf)(c+dx)}\right)}{f}-\frac{F^a\text{Ei}\left(\frac{b\log(F)}{c+dx}\right)}{f}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x))/(e + f*x),x]
```

```
[Out] -((F^a*ExpIntegralEi[(b*Log[F])/(c + d*x)])/f) + (F^(a - (b*f)/(d*e - c*f))
*ExpIntegralEi[(b*d*(e + f*x)*Log[F])/((d*e - c*f)*(c + d*x))])/f
```

Rule 2178

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - (c*f)/d))*ExpIntegralEi[(f*g*(c + d*x)*Log[F])/d])/d, x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2222

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))/((e_.) + (f_.)*(x_)), x_Symbo
l] :> Dist[d/f, Int[F^(a + b/(c + d*x))/(c + d*x), x], x] - Dist[(d*e - c*f
)/f, Int[F^(a + b/(c + d*x))/((c + d*x)*(e + f*x)), x], x] /; FreeQ[{F, a,
```

```
b, c, d, e, f}, x] && NeQ[d*e - c*f, 0]
```

Rule 2228

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))/(((e_.) + (f_.)*(x_))*((g_.)
+ (h_.)*(x_))), x_Symbol] :> -Dist[d/(f*(d*g - c*h)), Subst[Int[F^(a - (b*h
)/(d*g - c*h) + (d*b*x)/(d*g - c*h))/x, x], x, (g + h*x)/(c + d*x)], x] /;
FreeQ[{F, a, b, c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\begin{aligned}\int \frac{F^{a+\frac{b}{c+dx}}}{e+fx}\,dx &= \frac{d\int \frac{F^{a+\frac{b}{c+dx}}}{c+dx}\,dx}{f}-\frac{(de-cf)\int \frac{F^{a+\frac{b}{c+dx}}}{(c+dx)(e+fx)}\,dx}{f}\\ &= -\frac{F^a\text{Ei}\left(\frac{b\log(F)}{c+dx}\right)}{f}+\frac{\text{Subst}\left(\int \frac{F^{a-\frac{bf}{de-cf}+\frac{bdx}{de-cf}}}{x}\,dx,x,\frac{e+fx}{c+dx}\right)}{f}\\ &= -\frac{F^a\text{Ei}\left(\frac{b\log(F)}{c+dx}\right)}{f}+\frac{F^{a-\frac{bf}{de-cf}}\text{Ei}\left(\frac{bd(e+fx)\log(F)}{(de-cf)(c+dx)}\right)}{f}\end{aligned}$$

Mathematica [A] time = 0.13, size = 66, normalized size = 0.93

$$\frac{F^a\left(F^{\frac{bf}{cf-de}}\text{Ei}\left(\frac{bd(e+fx)\log(F)}{(de-cf)(c+dx)}\right)-\text{Ei}\left(\frac{b\log(F)}{c+dx}\right)\right)}{f}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x))/(e + f*x),x]
```

```
[Out] (F^a*(-ExpIntegralEi[(b*Log[F])/(c + d*x)] + F^((b*f)/(-(d*e) + c*f))*ExpIn
tegralEi[(b*d*(e + f*x)*Log[F])/((d*e - c*f)*(c + d*x))]))/f
```

fricas [A] time = 0.43, size = 89, normalized size = 1.25

$$\frac{F^{\frac{ade-(ac+b)f}{de-cf}}\text{Ei}\left(\frac{(bdfx+bde)\log(F)}{cde-c^2f+\left(d^2e-cdf\right)x}\right)-F^a\text{Ei}\left(\frac{b\log(F)}{dx+c}\right)}{f}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(f*x+e),x, algorithm="fricas")
```

```
[Out] (F^((a*d*e - (a*c + b)*f)/(d*e - c*f))*Ei((b*d*f*x + b*d*e)*log(F)/(c*d*e -
 c^2*f + (d^2*e - c*d*f)*x)) - F^a*Ei(b*log(F)/(d*x + c)))/f
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{dx+c}}}{fx+e}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(f*x+e),x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c))/(f*x + e), x)
```

maple [A] time = 0.20, size = 106, normalized size = 1.49

$$\frac{F^{a}\,\mathrm{Ei}\left(1,-\frac{b\ln(F)}{dx+c}\right)}{f}-\frac{F^{\frac{acf-ade+bf}{cf-de}}\,\mathrm{Ei}\left(1,-a\ln(F)-\frac{b\ln(F)}{dx+c}-\frac{-acf\ln(F)+ade\ln(F)-bf\ln(F)}{cf-de}\right)}{f}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)*b)/(f*x+e),x)
```

```
[Out] 1/f*F^a*Ei(1,-1/(d*x+c)*b*ln(F))-1/f*F^((a*c*f-a*d*e+b*f)/(c*f-d*e))*Ei(1,-
1/(d*x+c)*b*ln(F)-a*ln(F)-(-ln(F)*a*c*f+ln(F)*a*d*e-ln(F)*b*f)/(c*f-d*e))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{dx+c}}}{fx+e}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(f*x+e),x, algorithm="maxima")
```

```
[Out] integrate(F^(a + b/(d*x + c))/(f*x + e), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{F^{a+\frac{b}{c+d\,x}}}{e+f\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x))/(e + f*x),x)
```

```
[Out] int(F^(a + b/(c + d*x))/(e + f*x), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c))/(f*x+e),x)
```

```
[Out] Timed out
```

3.398 $\int \frac{F^{a+\frac{b}{c+dx}}}{(e+fx)^2}\,dx$

Optimal. Leaf size=116

$$-\frac{bd\log(F)F^{a-\frac{bf}{de-cf}}\operatorname{Ei}\left(\frac{bd(e+fx)\log(F)}{(de-cf)(c+dx)}\right)}{(de-cf)^2}+\frac{dF^{a+\frac{b}{c+dx}}}{f(de-cf)}-\frac{F^{a+\frac{b}{c+dx}}}{f(e+fx)}$$

```
[Out] d*F^(a+b/(d*x+c))/f/(-c*f+d*e)-F^(a+b/(d*x+c))/f/(f*x+e)-b*d*F^(a-b*f/(-c*f
+d*e))*Ei(b*d*(f*x+e)*ln(F)/(-c*f+d*e)/(d*x+c))*ln(F)/(-c*f+d*e)^2
```

Rubi [A] time = 1.01, antiderivative size = 116, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {2223, 6742, 2209, 2210, 2222, 2228, 2178}

$$-\frac{bd\log(F)F^{a-\frac{bf}{de-cf}}\operatorname{Ei}\left(\frac{bd(e+fx)\log(F)}{(de-cf)(c+dx)}\right)}{(de-cf)^2}+\frac{dF^{a+\frac{b}{c+dx}}}{f(de-cf)}-\frac{F^{a+\frac{b}{c+dx}}}{f(e+fx)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x))/(e + f*x)^2,x]
```

```
[Out] (d*F^(a + b/(c + d*x)))/(f*(d*e - c*f)) - F^(a + b/(c + d*x))/(f*(e + f*x))
 - (b*d*F^(a - (b*f)/(d*e - c*f))*ExpIntegralEi[(b*d*(e + f*x)*Log[F])/((d*
e - c*f)*(c + d*x))]*Log[F])/(d*e - c*f)^2
```

Rule 2178

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - (c*f)/d))*ExpIntegralEi[(f*g*(c + d*x)*Log[F])/d])/d, x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
```

```
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2222

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))/((e_.) + (f_.)*(x_)), x_Symbo
l] :> Dist[d/f, Int[F^(a + b/(c + d*x))/(c + d*x), x], x] - Dist[(d*e - c*f
)/f, Int[F^(a + b/(c + d*x))/((c + d*x)*(e + f*x)), x], x] /; FreeQ[{F, a,
b, c, d, e, f}, x] && NeQ[d*e - c*f, 0]
```

Rule 2223

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))*((e_.) + (f_.)*(x_))^(m_), x_
Symbol] :> Simp[((e + f*x)^(m + 1)*F^(a + b/(c + d*x)))/(f*(m + 1)), x] + D
ist[(b*d*Log[F])/(f*(m + 1)), Int[((e + f*x)^(m + 1)*F^(a + b/(c + d*x)))/(
c + d*x)^2, x], x] /; FreeQ[{F, a, b, c, d, e, f}, x] && NeQ[d*e - c*f, 0]
&& ILtQ[m, -1]
```

Rule 2228

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))/(((e_.) + (f_.)*(x_))*((g_.)
+ (h_.)*(x_))), x_Symbol] :> -Dist[d/(f*(d*g - c*h)), Subst[Int[F^(a - (b*h
)/(d*g - c*h) + (d*b*x)/(d*g - c*h))/x, x], x, (g + h*x)/(c + d*x)], x] /;
FreeQ[{F, a, b, c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{c+dx}}}{(e+fx)^2}\,dx = -\frac{F^{a+\frac{b}{c+dx}}}{f(e+fx)} - \frac{(bd\log(F))\int \frac{F^{a+\frac{b}{c+dx}}}{(c+dx)^2(e+fx)}\,dx}{f}$$

$$= -\frac{F^{a+\frac{b}{c+dx}}}{f(e+fx)} - \frac{(bd\log(F))\int \left(\frac{dF^{a+\frac{b}{c+dx}}}{(de-cf)(c+dx)^2} - \frac{dfF^{a+\frac{b}{c+dx}}}{(de-cf)^2(c+dx)} + \frac{f^2F^{a+\frac{b}{c+dx}}}{(de-cf)^2(e+fx)}\right)dx}{f}$$

$$= -\frac{F^{a+\frac{b}{c+dx}}}{f(e+fx)} + \frac{\left(bd^2\log(F)\right)\int \frac{F^{a+\frac{b}{c+dx}}}{c+dx}\,dx}{(de-cf)^2} - \frac{(bdf\log(F))\int \frac{F^{a+\frac{b}{c+dx}}}{e+fx}\,dx}{(de-cf)^2} - \frac{\left(bd^2\log(F)\right)\int \frac{F^{a+\frac{b}{c+dx}}}{(c+dx)^2}\,dx}{f(de-cf)}$$

$$= \frac{dF^{a+\frac{b}{c+dx}}}{f(de-cf)} - \frac{F^{a+\frac{b}{c+dx}}}{f(e+fx)} - \frac{bdF^a\text{Ei}\left(\frac{b\log(F)}{c+dx}\right)\log(F)}{(de-cf)^2} - \frac{\left(bd^2\log(F)\right)\int \frac{F^{a+\frac{b}{c+dx}}}{c+dx}\,dx}{(de-cf)^2} + \frac{(bd\log(F))\int}{de-}$$

$$= \frac{dF^{a+\frac{b}{c+dx}}}{f(de-cf)} - \frac{F^{a+\frac{b}{c+dx}}}{f(e+fx)} - \frac{(bd\log(F))\,\text{Subst}\left(\int \frac{F^{a-\frac{bf}{de-cf}+\frac{bdx}{de-cf}}}{x}\,dx, x, \frac{e+fx}{c+dx}\right)}{(de-cf)^2}$$

$$= \frac{dF^{a+\frac{b}{c+dx}}}{f(de-cf)} - \frac{F^{a+\frac{b}{c+dx}}}{f(e+fx)} - \frac{bdF^{a-\frac{bf}{de-cf}}\text{Ei}\left(\frac{bd(e+fx)\log(F)}{(de-cf)(c+dx)}\right)\log(F)}{(de-cf)^2}$$

Mathematica [A] time = 0.33, size = 116, normalized size = 1.00

$$-\frac{bd\log(F)F^{a+\frac{bf}{cf-de}}\text{Ei}\left(\frac{b\log(F)}{c+dx} - \frac{bf\log(F)}{cf-de}\right)}{(de-cf)^2} + \frac{dF^{a+\frac{b}{c+dx}}}{f(de-cf)} - \frac{F^{a+\frac{b}{c+dx}}}{f(e+fx)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b/(c + d*x))/(e + f*x)^2,x]
```

```
[Out] (d*F^(a + b/(c + d*x)))/(f*(d*e - c*f)) - F^(a + b/(c + d*x))/(f*(e + f*x))
 - (b*d*F^(a + (b*f)/(-(d*e) + c*f))*ExpIntegralEi[-((b*f*Log[F])/(-(d*e) +
 c*f)) + (b*Log[F])/(c + d*x)]*Log[F])/(d*e - c*f)^2
```

fricas [A] time = 0.44, size = 179, normalized size = 1.54

$$-\frac{\left(bdfx+bde\right)F^{\frac{ade-(ac+b)f}{de-cf}}\text{Ei}\left(\frac{\left(bdfx+bde\right)\log(F)}{cde-c^2f+\left(d^2e-cdf\right)x}\right)\log(F) - \left(cde-c^2f+\left(d^2e-cdf\right)x\right)F^{\frac{adx+ac+b}{dx+c}}}{d^2e^3-2\,cde^2f+c^2ef^2+\left(d^2e^2f-2\,cdef^2+c^2f^3\right)x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(f*x+e)^2,x, algorithm="fricas")
```

```
[Out] -((b*d*f*x + b*d*e)*F^((a*d*e - (a*c + b)*f)/(d*e - c*f))*Ei((b*d*f*x + b*d
*e)*log(F)/(c*d*e - c^2*f + (d^2*e - c*d*f)*x))*log(F) - (c*d*e - c^2*f + (
d^2*e - c*d*f)*x)*F^((a*d*x + a*c + b)/(d*x + c)))/(d^2*e^3 - 2*c*d*e^2*f +
 c^2*e*f^2 + (d^2*e^2*f - 2*c*d*e*f^2 + c^2*f^3)*x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{dx+c}}}{\left(fx+e\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(f*x+e)^2,x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c))/(f*x + e)^2, x)
```

maple [A] time = 0.17, size = 191, normalized size = 1.65

$$\frac{bd\,F^{a}F^{\frac{b}{dx+c}}\ln(F)}{\left(cf-de\right)^{2}\left(-\frac{acf\ln(F)}{cf-de}+\frac{ade\ln(F)}{cf-de}-\frac{bf\ln(F)}{cf-de}+a\ln(F)+\frac{b\ln(F)}{dx+c}\right)}+\frac{bd\,F^{\frac{acf-ade+bf}{cf-de}}\operatorname{Ei}\left(1,-a\ln(F)-\frac{b\ln(F)}{dx+c}-\frac{-acf\ln(F)+ade\ln \cdots}{cf- \cdots}\right)}{\left(cf-de\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)*b)/(f*x+e)^2,x)
```

```
[Out] d*ln(F)*b/(c*f-d*e)^2*F^a*F^(1/(d*x+c)*b)/(1/(d*x+c)*b*ln(F)+a*ln(F)-1/(c*f
-d*e)*ln(F)*a*c*f+1/(c*f-d*e)*ln(F)*a*d*e-1/(c*f-d*e)*ln(F)*b*f)+d*ln(F)*b/
(c*f-d*e)^2*F^((a*c*f-a*d*e+b*f)/(c*f-d*e))*Ei(1,-a*ln(F)-1/(d*x+c)*b*ln(F)
-(-a*c*f*ln(F)+a*d*e*ln(F)-b*f*ln(F))/(c*f-d*e))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{dx+c}}}{\left(fx+e\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(f*x+e)^2,x, algorithm="maxima")
```

```
[Out] integrate(F^(a + b/(d*x + c))/(f*x + e)^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{F^{a+\frac{b}{c+d\,x}}}{{\left(e+f\,x\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x))/(e + f*x)^2,x)
```

```
[Out] int(F^(a + b/(c + d*x))/(e + f*x)^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c))/(f*x+e)**2,x)
```

```
[Out] Timed out
```

3.399 $\int \frac{F^{a+\frac{b}{c+dx}}}{(e+fx)^3}\,dx$

Optimal. Leaf size=267

$$\frac{b^2d^2f\log^2(F)F^{a-\frac{bf}{de-cf}}\operatorname{Ei}\left(\frac{bd(e+fx)\log(F)}{(de-cf)(c+dx)}\right)}{2(de-cf)^4}-\frac{bd^2\log(F)F^{a-\frac{bf}{de-cf}}\operatorname{Ei}\left(\frac{bd(e+fx)\log(F)}{(de-cf)(c+dx)}\right)}{(de-cf)^3}+\frac{d^2F^{a+\frac{b}{c+dx}}}{2f(de-cf)^2}-\frac{bd^2\log(F)F^{a+\frac{b}{c+dx}}}{2(de-cf)^3}-$$

```
[Out] 1/2*d^2*F^(a+b/(d*x+c))/f/(-c*f+d*e)^2-1/2*F^(a+b/(d*x+c))/f/(f*x+e)^2-1/2*
b*d^2*F^(a+b/(d*x+c))*ln(F)/(-c*f+d*e)^3+1/2*b*d*F^(a+b/(d*x+c))*ln(F)/(-c*
f+d*e)^2/(f*x+e)-b*d^2*F^(a-b*f/(-c*f+d*e))*Ei(b*d*(f*x+e)*ln(F)/(-c*f+d*e)
/(d*x+c))*ln(F)/(-c*f+d*e)^3+1/2*b^2*d^2*f*F^(a-b*f/(-c*f+d*e))*Ei(b*d*(f*x
+e)*ln(F)/(-c*f+d*e)/(d*x+c))*ln(F)^2/(-c*f+d*e)^4
```

Rubi [A] time = 1.91, antiderivative size = 267, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {2223, 6742, 2209, 2210, 2222, 2228, 2178}

$$\frac{b^2d^2f\log^2(F)F^{a-\frac{bf}{de-cf}}\operatorname{Ei}\left(\frac{bd(e+fx)\log(F)}{(de-cf)(c+dx)}\right)}{2(de-cf)^4}-\frac{bd^2\log(F)F^{a-\frac{bf}{de-cf}}\operatorname{Ei}\left(\frac{bd(e+fx)\log(F)}{(de-cf)(c+dx)}\right)}{(de-cf)^3}+\frac{d^2F^{a+\frac{b}{c+dx}}}{2f(de-cf)^2}-\frac{bd^2\log(F)F^{a+\frac{b}{c+dx}}}{2(de-cf)^3}-$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x))/(e + f*x)^3,x]
```

```
[Out] (d^2*F^(a + b/(c + d*x)))/(2*f*(d*e - c*f)^2) - F^(a + b/(c + d*x))/(2*f*(e
 + f*x)^2) - (b*d^2*F^(a + b/(c + d*x))*Log[F])/(2*(d*e - c*f)^3) + (b*d*F^
(a + b/(c + d*x))*Log[F])/(2*(d*e - c*f)^2*(e + f*x)) - (b*d^2*F^(a - (b*f)
/(d*e - c*f))*ExpIntegralEi[(b*d*(e + f*x)*Log[F])/((d*e - c*f)*(c + d*x))]
*Log[F])/(d*e - c*f)^3 + (b^2*d^2*f*F^(a - (b*f)/(d*e - c*f))*ExpIntegralEi
[(b*d*(e + f*x)*Log[F])/((d*e - c*f)*(c + d*x))]*Log[F]^2)/(2*(d*e - c*f)^4
)
```

Rule 2178

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - (c*f)/d))*ExpIntegralEi[(f*g*(c + d*x)*Log[F])/d])/d, x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
```

```
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2222

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))/((e_.) + (f_.)*(x_)), x_Symbo
l] :> Dist[d/f, Int[F^(a + b/(c + d*x))/(c + d*x), x], x] - Dist[(d*e - c*f
)/f, Int[F^(a + b/(c + d*x))/((c + d*x)*(e + f*x)), x], x] /; FreeQ[{F, a,
b, c, d, e, f}, x] && NeQ[d*e - c*f, 0]
```

Rule 2223

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))*((e_.) + (f_.)*(x_))^(m_), x_
Symbol] :> Simp[((e + f*x)^(m + 1)*F^(a + b/(c + d*x)))/(f*(m + 1)), x] + D
ist[(b*d*Log[F])/(f*(m + 1)), Int[((e + f*x)^(m + 1)*F^(a + b/(c + d*x)))/(
c + d*x)^2, x], x] /; FreeQ[{F, a, b, c, d, e, f}, x] && NeQ[d*e - c*f, 0]
&& ILtQ[m, -1]
```

Rule 2228

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))/(((e_.) + (f_.)*(x_))*((g_.)
+ (h_.)*(x_))), x_Symbol] :> -Dist[d/(f*(d*g - c*h)), Subst[Int[F^(a - (b*h
)/(d*g - c*h) + (d*b*x)/(d*g - c*h))/x, x], x, (g + h*x)/(c + d*x)], x] /;
FreeQ[{F, a, b, c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{c+dx}}}{(e+fx)^3}\,dx = -\frac{F^{a+\frac{b}{c+dx}}}{2f(e+fx)^2} - \frac{(bd\log(F))\int \frac{F^{a+\frac{b}{c+dx}}}{(c+dx)^2(e+fx)^2}\,dx}{2f}$$

$$= -\frac{F^{a+\frac{b}{c+dx}}}{2f(e+fx)^2} - \frac{(bd\log(F))\int \left(\frac{d^2F^{a+\frac{b}{c+dx}}}{(de-cf)^2(c+dx)^2} - \frac{2d^2fF^{a+\frac{b}{c+dx}}}{(de-cf)^3(c+dx)} + \frac{f^2F^{a+\frac{b}{c+dx}}}{(de-cf)^2(e+fx)^2} + \frac{2df^2F^{a+\frac{b}{c+dx}}}{(de-cf)^3(e+fx)}\right) dx}{2f}$$

$$= -\frac{F^{a+\frac{b}{c+dx}}}{2f(e+fx)^2} + \frac{\left(bd^3\log(F)\right)\int \frac{F^{a+\frac{b}{c+dx}}}{c+dx}\,dx}{(de-cf)^3} - \frac{\left(bd^2f\log(F)\right)\int \frac{F^{a+\frac{b}{c+dx}}}{e+fx}\,dx}{(de-cf)^3} - \frac{\left(bd^3\log(F)\right)\int \frac{F^{a+\frac{b}{c+dx}}}{(c+d}}{2f(de-cf)^2}$$

$$= \frac{d^2F^{a+\frac{b}{c+dx}}}{2f(de-cf)^2} - \frac{F^{a+\frac{b}{c+dx}}}{2f(e+fx)^2} + \frac{bdF^{a+\frac{b}{c+dx}}\log(F)}{2(de-cf)^2(e+fx)} - \frac{bd^2F^a\text{Ei}\left(\frac{b\log(F)}{c+dx}\right)\log(F)}{(de-cf)^3} - \frac{\left(bd^3\log(F)\right)}{(de-}$$

$$= \frac{d^2F^{a+\frac{b}{c+dx}}}{2f(de-cf)^2} - \frac{F^{a+\frac{b}{c+dx}}}{2f(e+fx)^2} + \frac{bdF^{a+\frac{b}{c+dx}}\log(F)}{2(de-cf)^2(e+fx)} - \frac{\left(bd^2\log(F)\right)\text{Subst}\left(\int \frac{F^{a-\frac{bf}{de-cf}+\frac{bdx}{de-cf}}}{x}\,dx,x\right.}{(de-cf)^3}$$

$$= \frac{d^2F^{a+\frac{b}{c+dx}}}{2f(de-cf)^2} - \frac{F^{a+\frac{b}{c+dx}}}{2f(e+fx)^2} + \frac{bdF^{a+\frac{b}{c+dx}}\log(F)}{2(de-cf)^2(e+fx)} - \frac{bd^2F^{a-\frac{bf}{de-cf}}\text{Ei}\left(\frac{bd(e+fx)\log(F)}{(de-cf)(c+dx)}\right)\log(F)}{(de-cf)^3} - \frac{(}{}$$

$$= \frac{d^2F^{a+\frac{b}{c+dx}}}{2f(de-cf)^2} - \frac{F^{a+\frac{b}{c+dx}}}{2f(e+fx)^2} - \frac{bd^2F^{a+\frac{b}{c+dx}}\log(F)}{2(de-cf)^3} + \frac{bdF^{a+\frac{b}{c+dx}}\log(F)}{2(de-cf)^2(e+fx)} - \frac{bd^2F^{a-\frac{bf}{de-cf}}\text{Ei}\left(\frac{bd(e+}{(de-}\right.}{(de-c}$$

$$= \frac{d^2F^{a+\frac{b}{c+dx}}}{2f(de-cf)^2} - \frac{F^{a+\frac{b}{c+dx}}}{2f(e+fx)^2} - \frac{bd^2F^{a+\frac{b}{c+dx}}\log(F)}{2(de-cf)^3} + \frac{bdF^{a+\frac{b}{c+dx}}\log(F)}{2(de-cf)^2(e+fx)} - \frac{bd^2F^{a-\frac{bf}{de-cf}}\text{Ei}\left(\frac{bd(e+}{(de-}\right.}{(de-c}$$

$$= \frac{d^2F^{a+\frac{b}{c+dx}}}{2f(de-cf)^2} - \frac{F^{a+\frac{b}{c+dx}}}{2f(e+fx)^2} - \frac{bd^2F^{a+\frac{b}{c+dx}}\log(F)}{2(de-cf)^3} + \frac{bdF^{a+\frac{b}{c+dx}}\log(F)}{2(de-cf)^2(e+fx)} - \frac{bd^2F^{a-\frac{bf}{de-cf}}\text{Ei}\left(\frac{bd(e+}{(de-}\right.}{(de-c}$$

Mathematica [F] time = 0.82, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{c+dx}}}{(e+fx)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[F^(a + b/(c + d*x))/(e + f*x)^3,x]
```

```
[Out] Integrate[F^(a + b/(c + d*x))/(e + f*x)^3, x]
```

fricas [B] time = 0.47, size = 555, normalized size = 2.08

$$\frac{\left(\left(b^2d^2f^3x^2+2\,b^2d^2ef^2x+b^2d^2e^2f\right)\log(F)^2-2\left(bd^3e^3-bcd^2e^2f+\left(bd^3ef^2-bcd^2f^3\right)x^2+2\left(bd^3e^2f-bcd^2ef^2\right)\right.}{2\left(d^4e^6-4\,cd^3e^5f+6\,c^2\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(f*x+e)^3,x, algorithm="fricas")
```

```
[Out] 1/2*(((b^2*d^2*f^3*x^2 + 2*b^2*d^2*e*f^2*x + b^2*d^2*e^2*f)*log(F)^2 - 2*(b
*d^3*e^3 - b*c*d^2*e^2*f + (b*d^3*e*f^2 - b*c*d^2*f^3)*x^2 + 2*(b*d^3*e^2*f
 - b*c*d^2*e*f^2)*x)*log(F))*F^((a*d*e - (a*c + b)*f)/(d*e - c*f))*Ei((b*d*
f*x + b*d*e)*log(F)/(c*d*e - c^2*f + (d^2*e - c*d*f)*x)) + (2*c*d^3*e^3 - 5
*c^2*d^2*e^2*f + 4*c^3*d*e*f^2 - c^4*f^3 + (d^4*e^2*f - 2*c*d^3*e*f^2 + c^2
*d^2*f^3)*x^2 + 2*(d^4*e^3 - 2*c*d^3*e^2*f + c^2*d^2*e*f^2)*x - (b*c*d^2*e^
2*f - b*c^2*d*e*f^2 + (b*d^3*e*f^2 - b*c*d^2*f^3)*x^2 + (b*d^3*e^2*f - b*c^
2*d*f^3)*x)*log(F))*F^((a*d*x + a*c + b)/(d*x + c)))/(d^4*e^6 - 4*c*d^3*e^5
*f + 6*c^2*d^2*e^4*f^2 - 4*c^3*d*e^3*f^3 + c^4*e^2*f^4 + (d^4*e^4*f^2 - 4*c
*d^3*e^3*f^3 + 6*c^2*d^2*e^2*f^4 - 4*c^3*d*e*f^5 + c^4*f^6)*x^2 + 2*(d^4*e^
5*f - 4*c*d^3*e^4*f^2 + 6*c^2*d^2*e^3*f^3 - 4*c^3*d*e^2*f^4 + c^4*e*f^5)*x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{dx+c}}}{\left(fx+e\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(f*x+e)^3,x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c))/(f*x + e)^3, x)
```

maple [A] time = 0.19, size = 506, normalized size = 1.90

$$-\frac{b^2d^2f\,F^aF^{\frac{b}{dx+c}}\ln(F)^2}{2\left(cf-de\right)^4\left(-\frac{acf\ln(F)}{cf-de}+\frac{ade\ln(F)}{cf-de}-\frac{bf\ln(F)}{cf-de}+a\ln(F)+\frac{b\ln(F)}{dx+c}\right)^2}-\frac{b^2d^2f\,F^aF^{\frac{b}{dx+c}}\ln(F)^2}{2\left(cf-de\right)^4\left(-\frac{acf\ln(F)}{cf-de}+\frac{ade\ln(F)}{cf-de}-\frac{bf\ln(F)}{cf-de}+a\ln\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)*b)/(f*x+e)^3,x)
```

```
[Out] -b*d^2*ln(F)/(c*f-d*e)^3*F^a*F^(1/(d*x+c)*b)/(-1/(c*f-d*e)*a*c*f*ln(F)+1/(c
*f-d*e)*a*d*e*ln(F)-1/(c*f-d*e)*b*f*ln(F)+a*ln(F)+1/(d*x+c)*b*ln(F))-b*d^2*
ln(F)/(c*f-d*e)^3*F^((a*c*f-a*d*e+b*f)/(c*f-d*e))*Ei(1,-a*ln(F)-1/(d*x+c)*b
*ln(F)-(-a*c*f*ln(F)+a*d*e*ln(F)-b*f*ln(F))/(c*f-d*e))-1/2*b^2*d^2*ln(F)^2*
f/(c*f-d*e)^4*F^a*F^(1/(d*x+c)*b)/(-1/(c*f-d*e)*a*c*f*ln(F)+1/(c*f-d*e)*a*d
*e*ln(F)-1/(c*f-d*e)*b*f*ln(F)+a*ln(F)+1/(d*x+c)*b*ln(F))^2-1/2*b^2*d^2*ln(
F)^2*f/(c*f-d*e)^4*F^a*F^(1/(d*x+c)*b)/(-1/(c*f-d*e)*a*c*f*ln(F)+1/(c*f-d*e
)*a*d*e*ln(F)-1/(c*f-d*e)*b*f*ln(F)+a*ln(F)+1/(d*x+c)*b*ln(F))-1/2*b^2*d^2*
ln(F)^2*f/(c*f-d*e)^4*F^((a*c*f-a*d*e+b*f)/(c*f-d*e))*Ei(1,-a*ln(F)-1/(d*x+
c)*b*ln(F)-(-a*c*f*ln(F)+a*d*e*ln(F)-b*f*ln(F))/(c*f-d*e))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{dx+c}}}{\left(fx+e\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(f*x+e)^3,x, algorithm="maxima")
```

```
[Out] integrate(F^(a + b/(d*x + c))/(f*x + e)^3, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{F^{a+\frac{b}{c+d\,x}}}{\left(e+f\,x\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x))/(e + f*x)^3,x)
```

```
[Out] int(F^(a + b/(c + d*x))/(e + f*x)^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c))/(f*x+e)**3,x)
```

```
[Out] Timed out
```

3.400 $\int \frac{F^{a+\frac{b}{c+dx}}}{(e+fx)^4}\,dx$

Optimal. Leaf size=460

$$-\frac{b^3d^3f^2\log^3(F)F^{a-\frac{bf}{de-cf}}\text{Ei}\left(\frac{bd(e+fx)\log(F)}{(de-cf)(c+dx)}\right)}{6(de-cf)^6}+\frac{b^2d^3f\log^2(F)F^{a-\frac{bf}{de-cf}}\text{Ei}\left(\frac{bd(e+fx)\log(F)}{(de-cf)(c+dx)}\right)}{(de-cf)^5}+\frac{b^2d^3f\log^2(F)F^{a+\frac{b}{c+dx}}}{6(de-cf)^5}-\frac{b^2d^2f}{6(e+}$$

```
[Out] 1/3*d^3*F^(a+b/(d*x+c))/f/(-c*f+d*e)^3-1/3*F^(a+b/(d*x+c))/f/(f*x+e)^3-5/6*
b*d^3*F^(a+b/(d*x+c))*ln(F)/(-c*f+d*e)^4+1/6*b*d*F^(a+b/(d*x+c))*ln(F)/(-c*
f+d*e)^2/(f*x+e)^2+2/3*b*d^2*F^(a+b/(d*x+c))*ln(F)/(-c*f+d*e)^3/(f*x+e)-b*d
^3*F^(a-b*f/(-c*f+d*e))*Ei(b*d*(f*x+e)*ln(F)/(-c*f+d*e)/(d*x+c))*ln(F)/(-c*
f+d*e)^4+1/6*b^2*d^3*f*F^(a+b/(d*x+c))*ln(F)^2/(-c*f+d*e)^5-1/6*b^2*d^2*f*F
^(a+b/(d*x+c))*ln(F)^2/(-c*f+d*e)^4/(f*x+e)+b^2*d^3*f*F^(a-b*f/(-c*f+d*e))*
Ei(b*d*(f*x+e)*ln(F)/(-c*f+d*e)/(d*x+c))*ln(F)^2/(-c*f+d*e)^5-1/6*b^3*d^3*f
^2*F^(a-b*f/(-c*f+d*e))*Ei(b*d*(f*x+e)*ln(F)/(-c*f+d*e)/(d*x+c))*ln(F)^3/(-
c*f+d*e)^6
```

Rubi [A] time = 3.75, antiderivative size = 460, normalized size of antiderivative = 1.00, number of steps used = 36, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {2223, 6742, 2209, 2210, 2222, 2228, 2178}

$$-\frac{b^3d^3f^2\log^3(F)F^{a-\frac{bf}{de-cf}}\text{Ei}\left(\frac{bd(e+fx)\log(F)}{(de-cf)(c+dx)}\right)}{6(de-cf)^6}+\frac{b^2d^3f\log^2(F)F^{a-\frac{bf}{de-cf}}\text{Ei}\left(\frac{bd(e+fx)\log(F)}{(de-cf)(c+dx)}\right)}{(de-cf)^5}-\frac{b^2d^2f\log^2(F)F^{a+\frac{b}{c+dx}}}{6(e+fx)(de-cf)^4}+\frac{b^2d^3f}{6}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b/(c + d*x))/(e + f*x)^4,x]
```

```
[Out] (d^3*F^(a + b/(c + d*x)))/(3*f*(d*e - c*f)^3) - F^(a + b/(c + d*x))/(3*f*(e
 + f*x)^3) - (5*b*d^3*F^(a + b/(c + d*x))*Log[F])/(6*(d*e - c*f)^4) + (b*d*
F^(a + b/(c + d*x))*Log[F])/(6*(d*e - c*f)^2*(e + f*x)^2) + (2*b*d^2*F^(a +
 b/(c + d*x))*Log[F])/(3*(d*e - c*f)^3*(e + f*x)) - (b*d^3*F^(a - (b*f)/(d*
e - c*f))*ExpIntegralEi[(b*d*(e + f*x)*Log[F])/((d*e - c*f)*(c + d*x))]*Log
[F])/(d*e - c*f)^4 + (b^2*d^3*f*F^(a + b/(c + d*x))*Log[F]^2)/(6*(d*e - c*f
)^5) - (b^2*d^2*f*F^(a + b/(c + d*x))*Log[F]^2)/(6*(d*e - c*f)^4*(e + f*x))
 + (b^2*d^3*f*F^(a - (b*f)/(d*e - c*f))*ExpIntegralEi[(b*d*(e + f*x)*Log[F]
)/((d*e - c*f)*(c + d*x))]*Log[F]^2)/(d*e - c*f)^5 - (b^3*d^3*f^2*F^(a - (b
*f)/(d*e - c*f))*ExpIntegralEi[(b*d*(e + f*x)*Log[F])/((d*e - c*f)*(c + d*x
))]*Log[F]^3)/(6*(d*e - c*f)^6)
```

Rule 2178

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - (c*f)/d))*ExpIntegralEi[(f*g*(c + d*x)*Log[F])/d])/d, x] /; F
reeQ[{F, c, d, e, f, g}, x] && !$UseGamma === True
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2222

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))/((e_.) + (f_.)*(x_)), x_Symbo
l] :> Dist[d/f, Int[F^(a + b/(c + d*x))/(c + d*x), x], x] - Dist[(d*e - c*f
)/f, Int[F^(a + b/(c + d*x))/((c + d*x)*(e + f*x)), x], x] /; FreeQ[{F, a,
b, c, d, e, f}, x] && NeQ[d*e - c*f, 0]
```

Rule 2223

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))*((e_.) + (f_.)*(x_))^(m_), x_
Symbol] :> Simp[((e + f*x)^(m + 1)*F^(a + b/(c + d*x)))/(f*(m + 1)), x] + D
ist[(b*d*Log[F])/(f*(m + 1)), Int[((e + f*x)^(m + 1)*F^(a + b/(c + d*x)))/(
c + d*x)^2, x], x] /; FreeQ[{F, a, b, c, d, e, f}, x] && NeQ[d*e - c*f, 0]
&& ILtQ[m, -1]
```

Rule 2228

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))/(((e_.) + (f_.)*(x_))*((g_.)
+ (h_.)*(x_))), x_Symbol] :> -Dist[d/(f*(d*g - c*h)), Subst[Int[F^(a - (b*h
)/(d*g - c*h) + (d*b*x)/(d*g - c*h))/x, x], x, (g + h*x)/(c + d*x)], x] /;
FreeQ[{F, a, b, c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int \frac{F^{a+\frac{b}{c+dx}}}{(e+fx)^4}\,dx = -\frac{F^{a+\frac{b}{c+dx}}}{3f(e+fx)^3} - \frac{(bd\log(F))\int \frac{F^{a+\frac{b}{c+dx}}}{(c+dx)^2(e+fx)^3}\,dx}{3f}$$

$$= -\frac{F^{a+\frac{b}{c+dx}}}{3f(e+fx)^3} - \frac{(bd\log(F))\int\left(\frac{d^3F^{a+\frac{b}{c+dx}}}{(de-cf)^3(c+dx)^2} - \frac{3d^3fF^{a+\frac{b}{c+dx}}}{(de-cf)^4(c+dx)} + \frac{f^2F^{a+\frac{b}{c+dx}}}{(de-cf)^2(e+fx)^3} + \frac{2df^2F^{a+\frac{b}{c+dx}}}{(de-cf)^3(e+fx)^2} + \right.}{3f}$$

$$= -\frac{F^{a+\frac{b}{c+dx}}}{3f(e+fx)^3} + \frac{\left(bd^4\log(F)\right)\int \frac{F^{a+\frac{b}{c+dx}}}{c+dx}\,dx}{(de-cf)^4} - \frac{\left(bd^3f\log(F)\right)\int \frac{F^{a+\frac{b}{c+dx}}}{e+fx}\,dx}{(de-cf)^4} - \frac{\left(bd^4\log(F)\right)\int \frac{F^{a+\frac{b}{c}}}{(c+d}}{3f(de-cf)^3}$$

$$= \frac{d^3F^{a+\frac{b}{c+dx}}}{3f(de-cf)^3} - \frac{F^{a+\frac{b}{c+dx}}}{3f(e+fx)^3} + \frac{bdF^{a+\frac{b}{c+dx}}\log(F)}{6(de-cf)^2(e+fx)^2} + \frac{2bd^2F^{a+\frac{b}{c+dx}}\log(F)}{3(de-cf)^3(e+fx)} - \frac{bd^3F^a\text{Ei}\left(\frac{b\log(F)}{c+dx}\right.}{(de-cf)}$$

$$= \frac{d^3F^{a+\frac{b}{c+dx}}}{3f(de-cf)^3} - \frac{F^{a+\frac{b}{c+dx}}}{3f(e+fx)^3} + \frac{bdF^{a+\frac{b}{c+dx}}\log(F)}{6(de-cf)^2(e+fx)^2} + \frac{2bd^2F^{a+\frac{b}{c+dx}}\log(F)}{3(de-cf)^3(e+fx)} - \frac{\left(bd^3\log(F)\right)\text{Sul}}{}$$

$$= \frac{d^3F^{a+\frac{b}{c+dx}}}{3f(de-cf)^3} - \frac{F^{a+\frac{b}{c+dx}}}{3f(e+fx)^3} + \frac{bdF^{a+\frac{b}{c+dx}}\log(F)}{6(de-cf)^2(e+fx)^2} + \frac{2bd^2F^{a+\frac{b}{c+dx}}\log(F)}{3(de-cf)^3(e+fx)} - \frac{bd^3F^{a-\frac{bf}{de-cf}}\text{Ei}\left(\frac{b}{(}\right.}{(de}$$

$$= \frac{d^3F^{a+\frac{b}{c+dx}}}{3f(de-cf)^3} - \frac{F^{a+\frac{b}{c+dx}}}{3f(e+fx)^3} - \frac{5bd^3F^{a+\frac{b}{c+dx}}\log(F)}{6(de-cf)^4} + \frac{bdF^{a+\frac{b}{c+dx}}\log(F)}{6(de-cf)^2(e+fx)^2} + \frac{2bd^2F^{a+\frac{b}{c+dx}}\log(}{3(de-cf)^3(e+}$$

$$= \frac{d^3F^{a+\frac{b}{c+dx}}}{3f(de-cf)^3} - \frac{F^{a+\frac{b}{c+dx}}}{3f(e+fx)^3} - \frac{5bd^3F^{a+\frac{b}{c+dx}}\log(F)}{6(de-cf)^4} + \frac{bdF^{a+\frac{b}{c+dx}}\log(F)}{6(de-cf)^2(e+fx)^2} + \frac{2bd^2F^{a+\frac{b}{c+dx}}\log(}{3(de-cf)^3(e+}$$

$$= \frac{d^3F^{a+\frac{b}{c+dx}}}{3f(de-cf)^3} - \frac{F^{a+\frac{b}{c+dx}}}{3f(e+fx)^3} - \frac{5bd^3F^{a+\frac{b}{c+dx}}\log(F)}{6(de-cf)^4} + \frac{bdF^{a+\frac{b}{c+dx}}\log(F)}{6(de-cf)^2(e+fx)^2} + \frac{2bd^2F^{a+\frac{b}{c+dx}}\log(}{3(de-cf)^3(e+}$$

$$= \frac{d^3F^{a+\frac{b}{c+dx}}}{3f(de-cf)^3} - \frac{F^{a+\frac{b}{c+dx}}}{3f(e+fx)^3} - \frac{5bd^3F^{a+\frac{b}{c+dx}}\log(F)}{6(de-cf)^4} + \frac{bdF^{a+\frac{b}{c+dx}}\log(F)}{6(de-cf)^2(e+fx)^2} + \frac{2bd^2F^{a+\frac{b}{c+dx}}\log(}{3(de-cf)^3(e+}$$

$$= \frac{d^3F^{a+\frac{b}{c+dx}}}{3f(de-cf)^3} - \frac{F^{a+\frac{b}{c+dx}}}{3f(e+fx)^3} - \frac{5bd^3F^{a+\frac{b}{c+dx}}\log(F)}{6(de-cf)^4} + \frac{bdF^{a+\frac{b}{c+dx}}\log(F)}{6(de-cf)^2(e+fx)^2} + \frac{2bd^2F^{a+\frac{b}{c+dx}}\log(}{3(de-cf)^3(e+}$$

$$= \frac{d^3F^{a+\frac{b}{c+dx}}}{3f(de-cf)^3} - \frac{F^{a+\frac{b}{c+dx}}}{3f(e+fx)^3} - \frac{5bd^3F^{a+\frac{b}{c+dx}}\log(F)}{6(de-cf)^4} + \frac{bdF^{a+\frac{b}{c+dx}}\log(F)}{6(de-cf)^2(e+fx)^2} + \frac{2bd^2F^{a+\frac{b}{c+dx}}\log(}{3(de-cf)^3(e+}$$

Mathematica [F] time = 0.63, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{c+dx}}}{(e+fx)^4}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[F^(a + b/(c + d*x))/(e + f*x)^4,x]
```

```
[Out] Integrate[F^(a + b/(c + d*x))/(e + f*x)^4, x]
```

fricas [B] time = 0.49, size = 1376, normalized size = 2.99

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(f*x+e)^4,x, algorithm="fricas")
```

```
[Out] -1/6*(((b^3*d^3*f^5*x^3 + 3*b^3*d^3*e*f^4*x^2 + 3*b^3*d^3*e^2*f^3*x + b^3*d
^3*e^3*f^2)*log(F)^3 - 6*(b^2*d^4*e^4*f - b^2*c*d^3*e^3*f^2 + (b^2*d^4*e*f^
4 - b^2*c*d^3*f^5)*x^3 + 3*(b^2*d^4*e^2*f^3 - b^2*c*d^3*e*f^4)*x^2 + 3*(b^2
*d^4*e^3*f^2 - b^2*c*d^3*e^2*f^3)*x)*log(F)^2 + 6*(b*d^5*e^5 - 2*b*c*d^4*e^
4*f + b*c^2*d^3*e^3*f^2 + (b*d^5*e^2*f^3 - 2*b*c*d^4*e*f^4 + b*c^2*d^3*f^5)
*x^3 + 3*(b*d^5*e^3*f^2 - 2*b*c*d^4*e^2*f^3 + b*c^2*d^3*e*f^4)*x^2 + 3*(b*d
^5*e^4*f - 2*b*c*d^4*e^3*f^2 + b*c^2*d^3*e^2*f^3)*x)*log(F))*F^((a*d*e - (a
*c + b)*f)/(d*e - c*f))*Ei((b*d*f*x + b*d*e)*log(F)/(c*d*e - c^2*f + (d^2*e
 - c*d*f)*x)) - (6*c*d^5*e^5 - 24*c^2*d^4*e^4*f + 38*c^3*d^3*e^3*f^2 - 30*c
^4*d^2*e^2*f^3 + 12*c^5*d*e*f^4 - 2*c^6*f^5 + 2*(d^6*e^3*f^2 - 3*c*d^5*e^2*
f^3 + 3*c^2*d^4*e*f^4 - c^3*d^3*f^5)*x^3 + 6*(d^6*e^4*f - 3*c*d^5*e^3*f^2 +
 3*c^2*d^4*e^2*f^3 - c^3*d^3*e*f^4)*x^2 + (b^2*c*d^3*e^3*f^2 - b^2*c^2*d^2*
e^2*f^3 + (b^2*d^4*e*f^4 - b^2*c*d^3*f^5)*x^3 + (2*b^2*d^4*e^2*f^3 - b^2*c*
d^3*e*f^4 - b^2*c^2*d^2*f^5)*x^2 + (b^2*d^4*e^3*f^2 + b^2*c*d^3*e^2*f^3 - 2
*b^2*c^2*d^2*e*f^4)*x)*log(F)^2 + 6*(d^6*e^5 - 3*c*d^5*e^4*f + 3*c^2*d^4*e^
3*f^2 - c^3*d^3*e^2*f^3)*x - (6*b*c*d^4*e^4*f - 13*b*c^2*d^3*e^3*f^2 + 8*b*
c^3*d^2*e^2*f^3 - b*c^4*d*e*f^4 + 5*(b*d^5*e^2*f^3 - 2*b*c*d^4*e*f^4 + b*c^
2*d^3*f^5)*x^3 + (11*b*d^5*e^3*f^2 - 18*b*c*d^4*e^2*f^3 + 3*b*c^2*d^3*e*f^4
 + 4*b*c^3*d^2*f^5)*x^2 + (6*b*d^5*e^4*f - 2*b*c*d^4*e^3*f^2 - 15*b*c^2*d^3
*e^2*f^3 + 12*b*c^3*d^2*e*f^4 - b*c^4*d*f^5)*x)*log(F))*F^((a*d*x + a*c + b
)/(d*x + c)))/(d^6*e^9 - 6*c*d^5*e^8*f + 15*c^2*d^4*e^7*f^2 - 20*c^3*d^3*e^
6*f^3 + 15*c^4*d^2*e^5*f^4 - 6*c^5*d*e^4*f^5 + c^6*e^3*f^6 + (d^6*e^6*f^3 -
 6*c*d^5*e^5*f^4 + 15*c^2*d^4*e^4*f^5 - 20*c^3*d^3*e^3*f^6 + 15*c^4*d^2*e^2
*f^7 - 6*c^5*d*e*f^8 + c^6*f^9)*x^3 + 3*(d^6*e^7*f^2 - 6*c*d^5*e^6*f^3 + 15
*c^2*d^4*e^5*f^4 - 20*c^3*d^3*e^4*f^5 + 15*c^4*d^2*e^3*f^6 - 6*c^5*d*e^2*f^
7 + c^6*e*f^8)*x^2 + 3*(d^6*e^8*f - 6*c*d^5*e^7*f^2 + 15*c^2*d^4*e^6*f^3 -
20*c^3*d^3*e^5*f^4 + 15*c^4*d^2*e^4*f^5 - 6*c^5*d*e^3*f^6 + c^6*e^2*f^7)*x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{dx+c}}}{\left(fx+e\right)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(f*x+e)^4,x, algorithm="giac")
```

```
[Out] integrate(F^(a + b/(d*x + c))/(f*x + e)^4, x)
```

maple [B] time = 0.22, size = 922, normalized size = 2.00

$$\frac{b^3d^3f^2F^aF^{\frac{b}{dx+c}}\ln(F)^3}{3\left(cf-de\right)^6\left(-\frac{acf\ln(F)}{cf-de}+\frac{ade\ln(F)}{cf-de}-\frac{bf\ln(F)}{cf-de}+a\ln(F)+\frac{b\ln(F)}{dx+c}\right)^3}+\frac{b^3d^3f^2F^aF^{\frac{b}{dx+c}}\ln(F)^3}{6\left(cf-de\right)^6\left(-\frac{acf\ln(F)}{cf-de}+\frac{ade\ln(F)}{cf-de}-\frac{bf\ln(F)}{cf-de}+a\ln\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+1/(d*x+c)*b)/(f*x+e)^4,x)
```

```
[Out] b*d^3*ln(F)/(c*f-d*e)^4*F^a*F^(1/(d*x+c)*b)/(-1/(c*f-d*e)*a*c*f*ln(F)+1/(c*
f-d*e)*a*d*e*ln(F)-1/(c*f-d*e)*b*f*ln(F)+a*ln(F)+1/(d*x+c)*b*ln(F))+b*d^3*l
n(F)/(c*f-d*e)^4*F^((a*c*f-a*d*e+b*f)/(c*f-d*e))*Ei(1,-a*ln(F)-1/(d*x+c)*b*
ln(F)-(-a*c*f*ln(F)+a*d*e*ln(F)-b*f*ln(F))/(c*f-d*e))+b^2*d^3*ln(F)^2*f/(c*
f-d*e)^5*F^a*F^(1/(d*x+c)*b)/(-1/(c*f-d*e)*a*c*f*ln(F)+1/(c*f-d*e)*a*d*e*ln
(F)-1/(c*f-d*e)*b*f*ln(F)+a*ln(F)+1/(d*x+c)*b*ln(F))^2+b^2*d^3*ln(F)^2*f/(c
*f-d*e)^5*F^a*F^(1/(d*x+c)*b)/(-1/(c*f-d*e)*a*c*f*ln(F)+1/(c*f-d*e)*a*d*e*l
n(F)-1/(c*f-d*e)*b*f*ln(F)+a*ln(F)+1/(d*x+c)*b*ln(F))+b^2*d^3*ln(F)^2*f/(c*
f-d*e)^5*F^((a*c*f-a*d*e+b*f)/(c*f-d*e))*Ei(1,-a*ln(F)-1/(d*x+c)*b*ln(F)-(-
a*c*f*ln(F)+a*d*e*ln(F)-b*f*ln(F))/(c*f-d*e))+1/3*b^3*d^3*ln(F)^3*f^2/(c*f-
d*e)^6*F^a*F^(1/(d*x+c)*b)/(-1/(c*f-d*e)*a*c*f*ln(F)+1/(c*f-d*e)*a*d*e*ln(F
)-1/(c*f-d*e)*b*f*ln(F)+a*ln(F)+1/(d*x+c)*b*ln(F))^3+1/6*b^3*d^3*ln(F)^3*f^
2/(c*f-d*e)^6*F^a*F^(1/(d*x+c)*b)/(-1/(c*f-d*e)*a*c*f*ln(F)+1/(c*f-d*e)*a*d
*e*ln(F)-1/(c*f-d*e)*b*f*ln(F)+a*ln(F)+1/(d*x+c)*b*ln(F))^2+1/6*b^3*d^3*ln(
F)^3*f^2/(c*f-d*e)^6*F^a*F^(1/(d*x+c)*b)/(-1/(c*f-d*e)*a*c*f*ln(F)+1/(c*f-d
*e)*a*d*e*ln(F)-1/(c*f-d*e)*b*f*ln(F)+a*ln(F)+1/(d*x+c)*b*ln(F))+1/6*b^3*d^
3*ln(F)^3*f^2/(c*f-d*e)^6*F^((a*c*f-a*d*e+b*f)/(c*f-d*e))*Ei(1,-a*ln(F)-1/(
d*x+c)*b*ln(F)-(-a*c*f*ln(F)+a*d*e*ln(F)-b*f*ln(F))/(c*f-d*e))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+\frac{b}{dx+c}}}{\left(fx+e\right)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b/(d*x+c))/(f*x+e)^4,x, algorithm="maxima")
```

```
[Out] integrate(F^(a + b/(d*x + c))/(f*x + e)^4, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{F^{a+\frac{b}{c+d\,x}}}{\left(e+f\,x\right)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b/(c + d*x))/(e + f*x)^4,x)
```

```
[Out] int(F^(a + b/(c + d*x))/(e + f*x)^4, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b/(d*x+c))/(f*x+e)**4,x)
```

```
[Out] Timed out
```

3.401 $\int e^{\frac{e}{c+dx}}(a+bx)^4\,dx$

Optimal. Leaf size=346

$$-\frac{4b^3e^4(bc-ad)\Gamma\left(-4,-\frac{e}{c+dx}\right)}{d^5}-\frac{b^2e^3(bc-ad)^2\text{Ei}\left(\frac{e}{c+dx}\right)}{d^5}+\frac{b^2e^2(c+dx)(bc-ad)^2e^{\frac{e}{c+dx}}}{d^5}+\frac{b^2e(c+dx)^2(bc-ad)^2e^{\frac{e}{c+dx}}}{d^5}$$

```
[Out] (-a*d+b*c)^4*exp(e/(d*x+c))*(d*x+c)/d^5-2*b*(-a*d+b*c)^3*e*exp(e/(d*x+c))*(
d*x+c)/d^5+b^2*(-a*d+b*c)^2*e^2*exp(e/(d*x+c))*(d*x+c)/d^5-2*b*(-a*d+b*c)^3
*exp(e/(d*x+c))*(d*x+c)^2/d^5+b^2*(-a*d+b*c)^2*e*exp(e/(d*x+c))*(d*x+c)^2/d
^5+2*b^2*(-a*d+b*c)^2*exp(e/(d*x+c))*(d*x+c)^3/d^5-(-a*d+b*c)^4*e*Ei(e/(d*x
+c))/d^5+2*b*(-a*d+b*c)^3*e^2*Ei(e/(d*x+c))/d^5-b^2*(-a*d+b*c)^2*e^3*Ei(e/(
d*x+c))/d^5+b^4*(d*x+c)^5*Ei(6,-e/(d*x+c))/d^5-4*b^3*(-a*d+b*c)*(d*x+c)^4*E
i(5,-e/(d*x+c))/d^5
```

Rubi [A] time = 0.36, antiderivative size = 346, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 5, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.263, Rules used = {2226, 2206, 2210, 2214, 2218}

$$-\frac{4b^3e^4(bc-ad)\text{Gamma}\left(-4,-\frac{e}{c+dx}\right)}{d^5}-\frac{b^4e^5\text{Gamma}\left(-5,-\frac{e}{c+dx}\right)}{d^5}-\frac{b^2e^3(bc-ad)^2\text{Ei}\left(\frac{e}{c+dx}\right)}{d^5}+\frac{b^2e^2(c+dx)(bc-ad}{d^5}$$

Antiderivative was successfully verified.

```
[In] Int[E^(e/(c + d*x))*(a + b*x)^4,x]
```

```
[Out] ((b*c - a*d)^4*E^(e/(c + d*x))*(c + d*x))/d^5 - (2*b*(b*c - a*d)^3*e*E^(e/(
c + d*x))*(c + d*x))/d^5 + (b^2*(b*c - a*d)^2*e^2*E^(e/(c + d*x))*(c + d*x)
)/d^5 - (2*b*(b*c - a*d)^3*E^(e/(c + d*x))*(c + d*x)^2)/d^5 + (b^2*(b*c - a
*d)^2*e*E^(e/(c + d*x))*(c + d*x)^2)/d^5 + (2*b^2*(b*c - a*d)^2*E^(e/(c + d
*x))*(c + d*x)^3)/d^5 - ((b*c - a*d)^4*e*ExpIntegralEi[e/(c + d*x)])/d^5 +
(2*b*(b*c - a*d)^3*e^2*ExpIntegralEi[e/(c + d*x)])/d^5 - (b^2*(b*c - a*d)^2
*e^3*ExpIntegralEi[e/(c + d*x)])/d^5 - (b^4*e^5*Gamma[-5, -(e/(c + d*x))])/
d^5 - (4*b^3*(b*c - a*d)*e^4*Gamma[-4, -(e/(c + d*x))])/d^5
```

Rule 2206

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[((c +
 d*x)*F^(a + b*(c + d*x)^n))/d, x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
```

```
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2226

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int e^{\frac{e}{c+dx}}(a+bx)^4\,dx = \int\left(\frac{(-bc+ad)^4e^{\frac{e}{c+dx}}}{d^4} - \frac{4b(bc-ad)^3e^{\frac{e}{c+dx}}(c+dx)}{d^4} + \frac{6b^2(bc-ad)^2e^{\frac{e}{c+dx}}(c+dx)^2}{d^4} - \frac{4b^3(bc\right.$$

$$= \frac{b^4\int e^{\frac{e}{c+dx}}(c+dx)^4\,dx}{d^4} - \frac{\left(4b^3(bc-ad)\right)\int e^{\frac{e}{c+dx}}(c+dx)^3\,dx}{d^4} + \frac{\left(6b^2(bc-ad)^2\right)\int e^{\frac{e}{c+dx}}(c+}{d^4}$$

$$= \frac{(bc-ad)^4e^{\frac{e}{c+dx}}(c+dx)}{d^5} - \frac{2b(bc-ad)^3e^{\frac{e}{c+dx}}(c+dx)^2}{d^5} + \frac{2b^2(bc-ad)^2e^{\frac{e}{c+dx}}(c+dx)^3}{d^5} - \frac{b^4e^5}{}$$

$$= \frac{(bc-ad)^4e^{\frac{e}{c+dx}}(c+dx)}{d^5} - \frac{2b(bc-ad)^3ee^{\frac{e}{c+dx}}(c+dx)}{d^5} - \frac{2b(bc-ad)^3e^{\frac{e}{c+dx}}(c+dx)^2}{d^5} + \frac{b^2(bc}{}$$

$$= \frac{(bc-ad)^4e^{\frac{e}{c+dx}}(c+dx)}{d^5} - \frac{2b(bc-ad)^3ee^{\frac{e}{c+dx}}(c+dx)}{d^5} + \frac{b^2(bc-ad)^2e^2e^{\frac{e}{c+dx}}(c+dx)}{d^5} - \frac{2b(b}{}$$

$$= \frac{(bc-ad)^4e^{\frac{e}{c+dx}}(c+dx)}{d^5} - \frac{2b(bc-ad)^3ee^{\frac{e}{c+dx}}(c+dx)}{d^5} + \frac{b^2(bc-ad)^2e^2e^{\frac{e}{c+dx}}(c+dx)}{d^5} - \frac{2b(b}{}$$

Mathematica [A] time = 0.50, size = 468, normalized size = 1.35

$$\frac{dxe^{\frac{e}{c+dx}}\left(120a^4d^4 + 240a^3bd^3(dx+e) + 120a^2b^2d^2\left(-4ce + 2d^2x^2 + dex + e^2\right) + 20ab^3d\left(18c^2e - 2ce(3dx+5e) +\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(e/(c + d*x))*(a + b*x)^4,x]
```

```
[Out] (c*(120*a^4*d^4 - 240*a^3*b*d^3*(c - e) + 120*a^2*b^2*d^2*(2*c^2 - 5*c*e +
e^2) - 20*a*b^3*d*(6*c^3 - 26*c^2*e + 11*c*e^2 - e^3) + b^4*(24*c^4 - 154*c
^3*e + 102*c^2*e^2 - 19*c*e^3 + e^4))*E^(e/(c + d*x)))/(120*d^5) + (d*E^(e/
(c + d*x))*x*(120*a^4*d^4 + 240*a^3*b*d^3*(e + d*x) + 120*a^2*b^2*d^2*(-4*c
*e + e^2 + d*e*x + 2*d^2*x^2) + 20*a*b^3*d*(18*c^2*e + e^3 + d*e^2*x + 2*d^
2*e*x^2 + 6*d^3*x^3 - 2*c*e*(5*e + 3*d*x)) + b^4*(-96*c^3*e + e^4 + d*e^3*x
 + 2*d^2*e^2*x^2 + 6*d^3*e*x^3 + 24*d^4*x^4 + 2*c^2*e*(43*e + 18*d*x) - 2*c
*e*(9*e^2 + 7*d*e*x + 8*d^2*x^2))) - e*(120*a^4*d^4 - 240*a^3*b*d^3*(2*c -
e) + 120*a^2*b^2*d^2*(6*c^2 - 6*c*e + e^2) - 20*a*b^3*d*(24*c^3 - 36*c^2*e
+ 12*c*e^2 - e^3) + b^4*(120*c^4 - 240*c^3*e + 120*c^2*e^2 - 20*c*e^3 + e^4
))*ExpIntegralEi[e/(c + d*x)])/(120*d^5)
```

fricas [B] time = 0.45, size = 638, normalized size = 1.84

$$-\frac{\left(b^4e^5 - 20\left(b^4c - ab^3d\right)e^4 + 120\left(b^4c^2 - 2\,ab^3cd + a^2b^2d^2\right)e^3 - 240\left(b^4c^3 - 3\,ab^3c^2d + 3\,a^2b^2cd^2 - a^3bd^3\right)e^2 + 1\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))*(b*x+a)^4,x, algorithm="fricas")
```

```
[Out] -1/120*((b^4*e^5 - 20*(b^4*c - a*b^3*d)*e^4 + 120*(b^4*c^2 - 2*a*b^3*c*d +
a^2*b^2*d^2)*e^3 - 240*(b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d
^3)*e^2 + 120*(b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3
+ a^4*d^4)*e)*Ei(e/(d*x + c)) - (24*b^4*d^5*x^5 + 24*b^4*c^5 - 120*a*b^3*c^
4*d + 240*a^2*b^2*c^3*d^2 - 240*a^3*b*c^2*d^3 + 120*a^4*c*d^4 + b^4*c*e^4 +
 6*(20*a*b^3*d^5 + b^4*d^4*e)*x^4 - (19*b^4*c^2 - 20*a*b^3*c*d)*e^3 + 2*(12
0*a^2*b^2*d^5 + b^4*d^3*e^2 - 4*(2*b^4*c*d^3 - 5*a*b^3*d^4)*e)*x^3 + 2*(51*
b^4*c^3 - 110*a*b^3*c^2*d + 60*a^2*b^2*c*d^2)*e^2 + (240*a^3*b*d^5 + b^4*d^
2*e^3 - 2*(7*b^4*c*d^2 - 10*a*b^3*d^3)*e^2 + 12*(3*b^4*c^2*d^2 - 10*a*b^3*c
*d^3 + 10*a^2*b^2*d^4)*e)*x^2 - 2*(77*b^4*c^4 - 260*a*b^3*c^3*d + 300*a^2*b
^2*c^2*d^2 - 120*a^3*b*c*d^3)*e + (120*a^4*d^5 + b^4*d*e^4 - 2*(9*b^4*c*d -
 10*a*b^3*d^2)*e^3 + 2*(43*b^4*c^2*d - 100*a*b^3*c*d^2 + 60*a^2*b^2*d^3)*e^
2 - 24*(4*b^4*c^3*d - 15*a*b^3*c^2*d^2 + 20*a^2*b^2*c*d^3 - 10*a^3*b*d^4)*e
)*x)*e^(e/(d*x + c)))/d^5
```

giac [B] time = 0.75, size = 1427, normalized size = 4.12

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))*(b*x+a)^4,x, algorithm="giac")
```

```
[Out] -1/120*(120*b^4*c^4*Ei(e/(d*x + c))*e^7/(d*x + c)^5 - 480*a*b^3*c^3*d*Ei(e/
(d*x + c))*e^7/(d*x + c)^5 + 720*a^2*b^2*c^2*d^2*Ei(e/(d*x + c))*e^7/(d*x +
 c)^5 - 480*a^3*b*c*d^3*Ei(e/(d*x + c))*e^7/(d*x + c)^5 + 120*a^4*d^4*Ei(e/
(d*x + c))*e^7/(d*x + c)^5 - 24*b^4*e^(e/(d*x + c) + 6) + 120*b^4*c*e^(e/(d
*x + c) + 6)/(d*x + c) - 240*b^4*c^2*e^(e/(d*x + c) + 6)/(d*x + c)^2 + 240*
b^4*c^3*e^(e/(d*x + c) + 6)/(d*x + c)^3 - 120*b^4*c^4*e^(e/(d*x + c) + 6)/(
d*x + c)^4 - 120*a*b^3*d*e^(e/(d*x + c) + 6)/(d*x + c) + 480*a*b^3*c*d*e^(e
/(d*x + c) + 6)/(d*x + c)^2 - 720*a*b^3*c^2*d*e^(e/(d*x + c) + 6)/(d*x + c)
^3 + 480*a*b^3*c^3*d*e^(e/(d*x + c) + 6)/(d*x + c)^4 - 240*a^2*b^2*d^2*e^(e
/(d*x + c) + 6)/(d*x + c)^2 + 720*a^2*b^2*c*d^2*e^(e/(d*x + c) + 6)/(d*x +
c)^3 - 720*a^2*b^2*c^2*d^2*e^(e/(d*x + c) + 6)/(d*x + c)^4 - 240*a^3*b*d^3*
e^(e/(d*x + c) + 6)/(d*x + c)^3 + 480*a^3*b*c*d^3*e^(e/(d*x + c) + 6)/(d*x
+ c)^4 - 120*a^4*d^4*e^(e/(d*x + c) + 6)/(d*x + c)^4 - 240*b^4*c^3*Ei(e/(d*
x + c))*e^8/(d*x + c)^5 + 720*a*b^3*c^2*d*Ei(e/(d*x + c))*e^8/(d*x + c)^5 -
 720*a^2*b^2*c*d^2*Ei(e/(d*x + c))*e^8/(d*x + c)^5 + 240*a^3*b*d^3*Ei(e/(d*
x + c))*e^8/(d*x + c)^5 - 6*b^4*e^(e/(d*x + c) + 7)/(d*x + c) + 40*b^4*c*e^
(e/(d*x + c) + 7)/(d*x + c)^2 - 120*b^4*c^2*e^(e/(d*x + c) + 7)/(d*x + c)^3
 + 240*b^4*c^3*e^(e/(d*x + c) + 7)/(d*x + c)^4 - 40*a*b^3*d*e^(e/(d*x + c)
+ 7)/(d*x + c)^2 + 240*a*b^3*c*d*e^(e/(d*x + c) + 7)/(d*x + c)^3 - 720*a*b^
```

```
3*c^2*d*e^(e/(d*x + c) + 7)/(d*x + c)^4 - 120*a^2*b^2*d^2*e^(e/(d*x + c) +
7)/(d*x + c)^3 + 720*a^2*b^2*c*d^2*e^(e/(d*x + c) + 7)/(d*x + c)^4 - 240*a^
3*b*d^3*e^(e/(d*x + c) + 7)/(d*x + c)^4 + 120*b^4*c^2*Ei(e/(d*x + c))*e^9/(
d*x + c)^5 - 240*a*b^3*c*d*Ei(e/(d*x + c))*e^9/(d*x + c)^5 + 120*a^2*b^2*d^
2*Ei(e/(d*x + c))*e^9/(d*x + c)^5 - 2*b^4*e^(e/(d*x + c) + 8)/(d*x + c)^2 +
 20*b^4*c*e^(e/(d*x + c) + 8)/(d*x + c)^3 - 120*b^4*c^2*e^(e/(d*x + c) + 8)
/(d*x + c)^4 - 20*a*b^3*d*e^(e/(d*x + c) + 8)/(d*x + c)^3 + 240*a*b^3*c*d*e
^(e/(d*x + c) + 8)/(d*x + c)^4 - 120*a^2*b^2*d^2*e^(e/(d*x + c) + 8)/(d*x +
 c)^4 - 20*b^4*c*Ei(e/(d*x + c))*e^10/(d*x + c)^5 + 20*a*b^3*d*Ei(e/(d*x +
c))*e^10/(d*x + c)^5 - b^4*e^(e/(d*x + c) + 9)/(d*x + c)^3 + 20*b^4*c*e^(e/
(d*x + c) + 9)/(d*x + c)^4 - 20*a*b^3*d*e^(e/(d*x + c) + 9)/(d*x + c)^4 + b
^4*Ei(e/(d*x + c))*e^11/(d*x + c)^5 - b^4*e^(e/(d*x + c) + 10)/(d*x + c)^4)
*(d*x + c)^5*e^(-6)/d^5
```

maple [B] time = 0.02, size = 1146, normalized size = 3.31

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(d*x+c))*(b*x+a)^4,x)
```

```
[Out] -1/d*e*(a^4*(-(d*x+c)/e*exp(e/(d*x+c))-Ei(1,-e/(d*x+c)))+b^4/d^4*e^4*(-1/5*
(d*x+c)^5/e^5*exp(e/(d*x+c))-1/20*(d*x+c)^4/e^4*exp(e/(d*x+c))-1/60*(d*x+c)
^3/e^3*exp(e/(d*x+c))-1/120*exp(e/(d*x+c))*(d*x+c)^2/e^2-1/120*(d*x+c)/e*ex
p(e/(d*x+c))-1/120*Ei(1,-e/(d*x+c)))+b^4*c^4/d^4*(-(d*x+c)/e*exp(e/(d*x+c))
-Ei(1,-e/(d*x+c)))+4*b^3/d^3*e^3*a*(-1/4*(d*x+c)^4/e^4*exp(e/(d*x+c))-1/12*
(d*x+c)^3/e^3*exp(e/(d*x+c))-1/24*exp(e/(d*x+c))*(d*x+c)^2/e^2-1/24*(d*x+c)
/e*exp(e/(d*x+c))-1/24*Ei(1,-e/(d*x+c)))-4*b^4/d^4*e^3*c*(-1/4*(d*x+c)^4/e^
4*exp(e/(d*x+c))-1/12*(d*x+c)^3/e^3*exp(e/(d*x+c))-1/24*exp(e/(d*x+c))*(d*x
+c)^2/e^2-1/24*(d*x+c)/e*exp(e/(d*x+c))-1/24*Ei(1,-e/(d*x+c)))+6*b^2/d^2*e^
2*a^2*(-1/3*(d*x+c)^3/e^3*exp(e/(d*x+c))-1/6*exp(e/(d*x+c))*(d*x+c)^2/e^2-1
/6*(d*x+c)/e*exp(e/(d*x+c))-1/6*Ei(1,-e/(d*x+c)))+6*b^4/d^4*e^2*c^2*(-1/3*(
d*x+c)^3/e^3*exp(e/(d*x+c))-1/6*exp(e/(d*x+c))*(d*x+c)^2/e^2-1/6*(d*x+c)/e*
exp(e/(d*x+c))-1/6*Ei(1,-e/(d*x+c)))+4*b/d*e*a^3*(-1/2*exp(e/(d*x+c))*(d*x+
c)^2/e^2-1/2*(d*x+c)/e*exp(e/(d*x+c))-1/2*Ei(1,-e/(d*x+c)))-4*b^4/d^4*e*c^3
*(-1/2*exp(e/(d*x+c))*(d*x+c)^2/e^2-1/2*(d*x+c)/e*exp(e/(d*x+c))-1/2*Ei(1,-
e/(d*x+c)))-4*b*c/d*a^3*(-(d*x+c)/e*exp(e/(d*x+c))-Ei(1,-e/(d*x+c)))+6*b^2*
c^2/d^2*a^2*(-(d*x+c)/e*exp(e/(d*x+c))-Ei(1,-e/(d*x+c)))-4*b^3*c^3/d^3*a*(-
(d*x+c)/e*exp(e/(d*x+c))-Ei(1,-e/(d*x+c)))-12*b^3/d^3*e^2*c*a*(-1/3*(d*x+c)
^3/e^3*exp(e/(d*x+c))-1/6*exp(e/(d*x+c))*(d*x+c)^2/e^2-1/6*(d*x+c)/e*exp(e/
(d*x+c))-1/6*Ei(1,-e/(d*x+c)))-12*b^2/d^2*e*c*a^2*(-1/2*exp(e/(d*x+c))*(d*x
+c)^2/e^2-1/2*(d*x+c)/e*exp(e/(d*x+c))-1/2*Ei(1,-e/(d*x+c)))+12*b^3/d^3*e*c
^2*a*(-1/2*exp(e/(d*x+c))*(d*x+c)^2/e^2-1/2*(d*x+c)/e*exp(e/(d*x+c))-1/2*Ei
(1,-e/(d*x+c))))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\left(24\,b^4d^4x^5+6\left(20\,ab^3d^4+b^4d^3e\right)x^4+2\left(120\,a^2b^2d^4+20\,ab^3d^3e-\left(8\,cd^2e-d^2e^2\right)b^4\right)x^3+\left(240\,a^3bd^4+120\,a^2b^2c\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))*(b*x+a)^4,x, algorithm="maxima")
```

```
[Out] 1/120*(24*b^4*d^4*x^5 + 6*(20*a*b^3*d^4 + b^4*d^3*e)*x^4 + 2*(120*a^2*b^2*d
^4 + 20*a*b^3*d^3*e - (8*c*d^2*e - d^2*e^2)*b^4)*x^3 + (240*a^3*b*d^4 + 120
*a^2*b^2*d^3*e - 20*(6*c*d^2*e - d^2*e^2)*a*b^3 + (36*c^2*d*e - 14*c*d*e^2
+ d*e^3)*b^4)*x^2 + (120*a^4*d^4 + 240*a^3*b*d^3*e - 120*(4*c*d^2*e - d^2*e
^2)*a^2*b^2 + 20*(18*c^2*d*e - 10*c*d*e^2 + d*e^3)*a*b^3 - (96*c^3*e - 86*c
^2*e^2 + 18*c*e^3 - e^4)*b^4)*x)*e^(e/(d*x + c))/d^4 + integrate(-1/120*(24
0*a^3*b*c^2*d^3*e - 120*(4*c^3*d^2*e - c^2*d^2*e^2)*a^2*b^2 + 20*(18*c^4*d*
e - 10*c^3*d*e^2 + c^2*d*e^3)*a*b^3 - (96*c^5*e - 86*c^4*e^2 + 18*c^3*e^3 -
 c^2*e^4)*b^4 - (120*a^4*d^5*e - 240*(2*c*d^4*e - d^4*e^2)*a^3*b + 120*(6*c
^2*d^3*e - 6*c*d^3*e^2 + d^3*e^3)*a^2*b^2 - 20*(24*c^3*d^2*e - 36*c^2*d^2*e
^2 + 12*c*d^2*e^3 - d^2*e^4)*a*b^3 + (120*c^4*d*e - 240*c^3*d*e^2 + 120*c^2
*d*e^3 - 20*c*d*e^4 + d*e^5)*b^4)*x)*e^(e/(d*x + c))/(d^6*x^2 + 2*c*d^5*x +
 c^2*d^4), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \mathrm{e}^{\frac{e}{c+d\,x}}\,{\left(a+b\,x\right)}^4 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(c + d*x))*(a + b*x)^4,x)
```

```
[Out] int(exp(e/(c + d*x))*(a + b*x)^4, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(a + bx\right)^{4} e^{\frac{e}{c + dx}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))*(b*x+a)**4,x)
```

```
[Out] Integral((a + b*x)**4*exp(e/(c + d*x)), x)
```

3.402 $\int e^{\frac{e}{c+dx}}(a+bx)^3\,dx$

Optimal. Leaf size=320

$$\frac{b^2e^3(bc-ad)\text{Ei}\left(\frac{e}{c+dx}\right)}{2d^4}-\frac{b^2e^2(c+dx)(bc-ad)e^{\frac{e}{c+dx}}}{2d^4}-\frac{b^2e(c+dx)^2(bc-ad)e^{\frac{e}{c+dx}}}{2d^4}-\frac{b^2(c+dx)^3(bc-ad)e^{\frac{e}{c+dx}}}{d^4}-\frac{3be^2(}{}$$

```
[Out] -(-a*d+b*c)^3*exp(e/(d*x+c))*(d*x+c)/d^4+3/2*b*(-a*d+b*c)^2*e*exp(e/(d*x+c)
)*(d*x+c)/d^4-1/2*b^2*(-a*d+b*c)*e^2*exp(e/(d*x+c))*(d*x+c)/d^4+3/2*b*(-a*d
+b*c)^2*exp(e/(d*x+c))*(d*x+c)^2/d^4-1/2*b^2*(-a*d+b*c)*e*exp(e/(d*x+c))*(d
*x+c)^2/d^4-b^2*(-a*d+b*c)*exp(e/(d*x+c))*(d*x+c)^3/d^4+(-a*d+b*c)^3*e*Ei(e
/(d*x+c))/d^4-3/2*b*(-a*d+b*c)^2*e^2*Ei(e/(d*x+c))/d^4+1/2*b^2*(-a*d+b*c)*e
^3*Ei(e/(d*x+c))/d^4+b^3*(d*x+c)^4*Ei(5,-e/(d*x+c))/d^4
```

Rubi [A] time = 0.32, antiderivative size = 320, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 5, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.263, Rules used = {2226, 2206, 2210, 2214, 2218}

$$\frac{b^3e^4\text{Gamma}\left(-4,-\frac{e}{c+dx}\right)}{d^4}+\frac{b^2e^3(bc-ad)\text{Ei}\left(\frac{e}{c+dx}\right)}{2d^4}-\frac{b^2e^2(c+dx)(bc-ad)e^{\frac{e}{c+dx}}}{2d^4}-\frac{b^2e(c+dx)^2(bc-ad)e^{\frac{e}{c+dx}}}{2d^4}-\frac{b^2(c}{}$$

Antiderivative was successfully verified.

```
[In] Int[E^(e/(c + d*x))*(a + b*x)^3,x]
```

```
[Out] -(((b*c - a*d)^3*E^(e/(c + d*x))*(c + d*x))/d^4) + (3*b*(b*c - a*d)^2*e*E^(
e/(c + d*x))*(c + d*x))/(2*d^4) - (b^2*(b*c - a*d)*e^2*E^(e/(c + d*x))*(c +
 d*x))/(2*d^4) + (3*b*(b*c - a*d)^2*E^(e/(c + d*x))*(c + d*x)^2)/(2*d^4) -
(b^2*(b*c - a*d)*e*E^(e/(c + d*x))*(c + d*x)^2)/(2*d^4) - (b^2*(b*c - a*d)*
E^(e/(c + d*x))*(c + d*x)^3)/d^4 + ((b*c - a*d)^3*e*ExpIntegralEi[e/(c + d*
x)])/d^4 - (3*b*(b*c - a*d)^2*e^2*ExpIntegralEi[e/(c + d*x)])/(2*d^4) + (b^
2*(b*c - a*d)*e^3*ExpIntegralEi[e/(c + d*x)])/(2*d^4) + (b^3*e^4*Gamma[-4,
-(e/(c + d*x))])/d^4
```

Rule 2206

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[((c +
 d*x)*F^(a + b*(c + d*x)^n))/d, x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
```

```
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2226

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int e^{\frac{e}{c+dx}}(a+bx)^3\,dx = \int \left(\frac{(-bc+ad)^3 e^{\frac{e}{c+dx}}}{d^3} + \frac{3b(bc-ad)^2 e^{\frac{e}{c+dx}}(c+dx)}{d^3} - \frac{3b^2(bc-ad)e^{\frac{e}{c+dx}}(c+dx)^2}{d^3} + \frac{b^3 e^{\frac{e}{c+dx}}(}{d}\right.$$

$$= \frac{b^3 \int e^{\frac{e}{c+dx}}(c+dx)^3\,dx}{d^3} - \frac{\left(3b^2(bc-ad)\right)\int e^{\frac{e}{c+dx}}(c+dx)^2\,dx}{d^3} + \frac{\left(3b(bc-ad)^2\right)\int e^{\frac{e}{c+dx}}(c+d}{d^3}$$

$$= -\frac{(bc-ad)^3 e^{\frac{e}{c+dx}}(c+dx)}{d^4} + \frac{3b(bc-ad)^2 e^{\frac{e}{c+dx}}(c+dx)^2}{2d^4} - \frac{b^2(bc-ad)e^{\frac{e}{c+dx}}(c+dx)^3}{d^4} + \frac{b^3e^4}{}$$

$$= -\frac{(bc-ad)^3 e^{\frac{e}{c+dx}}(c+dx)}{d^4} + \frac{3b(bc-ad)^2 e e^{\frac{e}{c+dx}}(c+dx)}{2d^4} + \frac{3b(bc-ad)^2 e^{\frac{e}{c+dx}}(c+dx)^2}{2d^4} - \frac{b^2(}{}$$

$$= -\frac{(bc-ad)^3 e^{\frac{e}{c+dx}}(c+dx)}{d^4} + \frac{3b(bc-ad)^2 e e^{\frac{e}{c+dx}}(c+dx)}{2d^4} - \frac{b^2(bc-ad)e^2 e^{\frac{e}{c+dx}}(c+dx)}{2d^4} + \frac{3b(}{}$$

$$= -\frac{(bc-ad)^3 e^{\frac{e}{c+dx}}(c+dx)}{d^4} + \frac{3b(bc-ad)^2 e e^{\frac{e}{c+dx}}(c+dx)}{2d^4} - \frac{b^2(bc-ad)e^2 e^{\frac{e}{c+dx}}(c+dx)}{2d^4} + \frac{3b(}{}$$

Mathematica [A] time = 0.33, size = 292, normalized size = 0.91

$$\frac{dxe^{\frac{e}{c+dx}}\left(24a^3d^3 + 36a^2bd^2(dx+e) + 12ab^2d\left(-4ce + 2d^2x^2 + dex + e^2\right) + b^3\left(18c^2e - 2ce(3dx+5e) + 6d^3x^3 + 2\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(e/(c + d*x))*(a + b*x)^3,x]
```

```
[Out] -1/24*(c*(-24*a^3*d^3 + 36*a^2*b*d^2*(c - e) - 12*a*b^2*d*(2*c^2 - 5*c*e +
e^2) + b^3*(6*c^3 - 26*c^2*e + 11*c*e^2 - e^3))*E^(e/(c + d*x)))/d^4 + (d*E
^(e/(c + d*x))*x*(24*a^3*d^3 + 36*a^2*b*d^2*(e + d*x) + 12*a*b^2*d*(-4*c*e
+ e^2 + d*e*x + 2*d^2*x^2) + b^3*(18*c^2*e + e^3 + d*e^2*x + 2*d^2*e*x^2 +
6*d^3*x^3 - 2*c*e*(5*e + 3*d*x))) - e*(24*a^3*d^3 + 36*a^2*b*d^2*(-2*c + e)
 + 12*a*b^2*d*(6*c^2 - 6*c*e + e^2) + b^3*(-24*c^3 + 36*c^2*e - 12*c*e^2 +
e^3))*ExpIntegralEi[e/(c + d*x)])/(24*d^4)
```

fricas [B] time = 0.43, size = 377, normalized size = 1.18

$$-\frac{\left(b^3e^4 - 12\left(b^3c - ab^2d\right)e^3 + 36\left(b^3c^2 - 2\,ab^2cd + a^2bd^2\right)e^2 - 24\left(b^3c^3 - 3\,ab^2c^2d + 3\,a^2bcd^2 - a^3d^3\right)e\right)\mathrm{Ei}\left(\frac{e}{dx+c}\right)}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))*(b*x+a)^3,x, algorithm="fricas")
```

```
[Out] -1/24*((b^3*e^4 - 12*(b^3*c - a*b^2*d)*e^3 + 36*(b^3*c^2 - 2*a*b^2*c*d + a^
2*b*d^2)*e^2 - 24*(b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*e)*Ei
(e/(d*x + c)) - (6*b^3*d^4*x^4 - 6*b^3*c^4 + 24*a*b^2*c^3*d - 36*a^2*b*c^2*
d^2 + 24*a^3*c*d^3 + b^3*c*e^3 + 2*(12*a*b^2*d^4 + b^3*d^3*e)*x^3 - (11*b^3
*c^2 - 12*a*b^2*c*d)*e^2 + (36*a^2*b*d^4 + b^3*d^2*e^2 - 6*(b^3*c*d^2 - 2*a
*b^2*d^3)*e)*x^2 + 2*(13*b^3*c^3 - 30*a*b^2*c^2*d + 18*a^2*b*c*d^2)*e + (24
*a^3*d^4 + b^3*d*e^3 - 2*(5*b^3*c*d - 6*a*b^2*d^2)*e^2 + 6*(3*b^3*c^2*d - 8
*a*b^2*c*d^2 + 6*a^2*b*d^3)*e)*x)*e^(e/(d*x + c)))/d^4
```

giac [B] time = 0.62, size = 830, normalized size = 2.59

$$\left(\frac{24\,b^3c^3\mathrm{Ei}\left(\frac{e}{dx+c}\right)e^6}{(dx+c)^4} - \frac{72\,ab^2c^2d\mathrm{Ei}\left(\frac{e}{dx+c}\right)e^6}{(dx+c)^4} + \frac{72\,a^2bcd^2\mathrm{Ei}\left(\frac{e}{dx+c}\right)e^6}{(dx+c)^4} - \frac{24\,a^3d^3\mathrm{Ei}\left(\frac{e}{dx+c}\right)e^6}{(dx+c)^4} + 6\,b^3e^{\left(\frac{e}{dx+c}+5\right)} - \frac{24\,b^3ce^{\left(\frac{e}{dx+c}+5\right)}}{dx+c} + \frac{36\,b^3c^2e^{\left(\frac{e}{dx+c}\right.}}{(dx+c)^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))*(b*x+a)^3,x, algorithm="giac")
```

```
[Out] 1/24*(24*b^3*c^3*Ei(e/(d*x + c))*e^6/(d*x + c)^4 - 72*a*b^2*c^2*d*Ei(e/(d*x
 + c))*e^6/(d*x + c)^4 + 72*a^2*b*c*d^2*Ei(e/(d*x + c))*e^6/(d*x + c)^4 - 2
4*a^3*d^3*Ei(e/(d*x + c))*e^6/(d*x + c)^4 + 6*b^3*e^(e/(d*x + c) + 5) - 24*
b^3*c*e^(e/(d*x + c) + 5)/(d*x + c) + 36*b^3*c^2*e^(e/(d*x + c) + 5)/(d*x +
 c)^2 - 24*b^3*c^3*e^(e/(d*x + c) + 5)/(d*x + c)^3 + 24*a*b^2*d*e^(e/(d*x +
 c) + 5)/(d*x + c) - 72*a*b^2*c*d*e^(e/(d*x + c) + 5)/(d*x + c)^2 + 72*a*b^
2*c^2*d*e^(e/(d*x + c) + 5)/(d*x + c)^3 + 36*a^2*b*d^2*e^(e/(d*x + c) + 5)/
(d*x + c)^2 - 72*a^2*b*c*d^2*e^(e/(d*x + c) + 5)/(d*x + c)^3 + 24*a^3*d^3*e
^(e/(d*x + c) + 5)/(d*x + c)^3 - 36*b^3*c^2*Ei(e/(d*x + c))*e^7/(d*x + c)^4
 + 72*a*b^2*c*d*Ei(e/(d*x + c))*e^7/(d*x + c)^4 - 36*a^2*b*d^2*Ei(e/(d*x +
c))*e^7/(d*x + c)^4 + 2*b^3*e^(e/(d*x + c) + 6)/(d*x + c) - 12*b^3*c*e^(e/(
d*x + c) + 6)/(d*x + c)^2 + 36*b^3*c^2*e^(e/(d*x + c) + 6)/(d*x + c)^3 + 12
*a*b^2*d*e^(e/(d*x + c) + 6)/(d*x + c)^2 - 72*a*b^2*c*d*e^(e/(d*x + c) + 6)
/(d*x + c)^3 + 36*a^2*b*d^2*e^(e/(d*x + c) + 6)/(d*x + c)^3 + 12*b^3*c*Ei(e
/(d*x + c))*e^8/(d*x + c)^4 - 12*a*b^2*d*Ei(e/(d*x + c))*e^8/(d*x + c)^4 +
b^3*e^(e/(d*x + c) + 7)/(d*x + c)^2 - 12*b^3*c*e^(e/(d*x + c) + 7)/(d*x + c
)^3 + 12*a*b^2*d*e^(e/(d*x + c) + 7)/(d*x + c)^3 - b^3*Ei(e/(d*x + c))*e^9/
(d*x + c)^4 + b^3*e^(e/(d*x + c) + 8)/(d*x + c)^3)*(d*x + c)^4*e^(-5)/d^4
```

maple [B] time = 0.02, size = 682, normalized size = 2.13

$$-\frac{\left(\left(-\operatorname{Ei}\left(1,-\frac{e}{dx+c}\right)-\frac{(dx+c)\,e^{\frac{e}{dx+c}}}{e}\right)a^3-\frac{3\left(-\operatorname{Ei}\left(1,-\frac{e}{dx+c}\right)-\frac{(dx+c)\,e^{\frac{e}{dx+c}}}{e}\right)a^2bc}{d}+\frac{3\left(-\frac{\operatorname{Ei}\left(1,-\frac{e}{dx+c}\right)}{2}-\frac{(dx+c)\,e^{\frac{e}{dx+c}}}{2e}-\frac{(dx+c)^2\,e^{\frac{e}{dx+c}}}{2e^2}\right)a^2be}{d}+\frac{3\left(-\operatorname{E}\right.}{}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(1/(d*x+c)*e)*(b*x+a)^3,x)
```

```
[Out] -1/d*e*(a^3*(-(d*x+c)/e*exp(1/(d*x+c)*e)-Ei(1,-1/(d*x+c)*e))+b^3/d^3*e^3*(-
1/4*(d*x+c)^4/e^4*exp(1/(d*x+c)*e)-1/12*(d*x+c)^3/e^3*exp(1/(d*x+c)*e)-1/24
*(d*x+c)^2/e^2*exp(1/(d*x+c)*e)-1/24*(d*x+c)/e*exp(1/(d*x+c)*e)-1/24*Ei(1,-
1/(d*x+c)*e))-b^3*c^3/d^3*(-(d*x+c)/e*exp(1/(d*x+c)*e)-Ei(1,-1/(d*x+c)*e))+
3*b^2/d^2*e^2*a*(-1/3*(d*x+c)^3/e^3*exp(1/(d*x+c)*e)-1/6*(d*x+c)^2/e^2*exp(
1/(d*x+c)*e)-1/6*(d*x+c)/e*exp(1/(d*x+c)*e)-1/6*Ei(1,-1/(d*x+c)*e))-3*b^3/d
^3*e^2*c*(-1/3*(d*x+c)^3/e^3*exp(1/(d*x+c)*e)-1/6*(d*x+c)^2/e^2*exp(1/(d*x+
c)*e)-1/6*(d*x+c)/e*exp(1/(d*x+c)*e)-1/6*Ei(1,-1/(d*x+c)*e))+3*b/d*e*a^2*(-
1/2*(d*x+c)^2/e^2*exp(1/(d*x+c)*e)-1/2*(d*x+c)/e*exp(1/(d*x+c)*e)-1/2*Ei(1,
-1/(d*x+c)*e))+3*b^3/d^3*e*c^2*(-1/2*(d*x+c)^2/e^2*exp(1/(d*x+c)*e)-1/2*(d*
x+c)/e*exp(1/(d*x+c)*e)-1/2*Ei(1,-1/(d*x+c)*e))-3*b*c/d*a^2*(-(d*x+c)/e*exp
(1/(d*x+c)*e)-Ei(1,-1/(d*x+c)*e))+3*b^2*c^2/d^2*a*(-(d*x+c)/e*exp(1/(d*x+c)
*e)-Ei(1,-1/(d*x+c)*e))-6*b^2/d^2*e*c*a*(-1/2*(d*x+c)^2/e^2*exp(1/(d*x+c)*e
)-1/2*(d*x+c)/e*exp(1/(d*x+c)*e)-1/2*Ei(1,-1/(d*x+c)*e)))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\left(6\,b^3d^3x^4+2\left(12\,ab^2d^3+b^3d^2e\right)x^3+\left(36\,a^2bd^3+12\,ab^2d^2e-\left(6\,cde-de^2\right)b^3\right)x^2+\left(24\,a^3d^3+36\,a^2bd^2e-12\left(4\right.\right.\right.}{24\,d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))*(b*x+a)^3,x, algorithm="maxima")
```

```
[Out] 1/24*(6*b^3*d^3*x^4 + 2*(12*a*b^2*d^3 + b^3*d^2*e)*x^3 + (36*a^2*b*d^3 + 12
*a*b^2*d^2*e - (6*c*d*e - d*e^2)*b^3)*x^2 + (24*a^3*d^3 + 36*a^2*b*d^2*e -
12*(4*c*d*e - d*e^2)*a*b^2 + (18*c^2*e - 10*c*e^2 + e^3)*b^3)*x)*e^(e/(d*x
+ c))/d^3 + integrate(-1/24*(36*a^2*b*c^2*d^2*e - 12*(4*c^3*d*e - c^2*d*e^2
)*a*b^2 + (18*c^4*e - 10*c^3*e^2 + c^2*e^3)*b^3 - (24*a^3*d^4*e - 36*(2*c*d
^3*e - d^3*e^2)*a^2*b + 12*(6*c^2*d^2*e - 6*c*d^2*e^2 + d^2*e^3)*a*b^2 - (2
4*c^3*d*e - 36*c^2*d*e^2 + 12*c*d*e^3 - d*e^4)*b^3)*x)*e^(e/(d*x + c))/(d^5
*x^2 + 2*c*d^4*x + c^2*d^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \mathrm{e}^{\frac{e}{c+d\,x}}\,{\left(a+b\,x\right)}^3 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(c + d*x))*(a + b*x)^3,x)
[Out] int(exp(e/(c + d*x))*(a + b*x)^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (a+bx)^3 e^{\frac{e}{c+dx}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))*(b*x+a)**3,x)
[Out] Integral((a + b*x)**3*exp(e/(c + d*x)), x)
```

3.403 $\int e^{\frac{e}{c+dx}}(a+bx)^2\,dx$

Optimal. Leaf size=255

$$\frac{be^2(bc-ad)\text{Ei}\left(\frac{e}{c+dx}\right)}{d^3}-\frac{e(bc-ad)^2\text{Ei}\left(\frac{e}{c+dx}\right)}{d^3}-\frac{be(c+dx)(bc-ad)e^{\frac{e}{c+dx}}}{d^3}-\frac{b(c+dx)^2(bc-ad)e^{\frac{e}{c+dx}}}{d^3}+\frac{(c+dx)(bc-a}{d^3}$$

```
[Out] (-a*d+b*c)^2*exp(e/(d*x+c))*(d*x+c)/d^3-b*(-a*d+b*c)*e*exp(e/(d*x+c))*(d*x+
c)/d^3+1/6*b^2*e^2*exp(e/(d*x+c))*(d*x+c)/d^3-b*(-a*d+b*c)*exp(e/(d*x+c))*(
d*x+c)^2/d^3+1/6*b^2*e*exp(e/(d*x+c))*(d*x+c)^2/d^3+1/3*b^2*exp(e/(d*x+c))*
(d*x+c)^3/d^3-(-a*d+b*c)^2*e*Ei(e/(d*x+c))/d^3+b*(-a*d+b*c)*e^2*Ei(e/(d*x+c
))/d^3-1/6*b^2*e^3*Ei(e/(d*x+c))/d^3
```

Rubi [A] time = 0.26, antiderivative size = 255, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.210, Rules used = {2226, 2206, 2210, 2214}

$$\frac{be^2(bc-ad)\text{Ei}\left(\frac{e}{c+dx}\right)}{d^3}-\frac{e(bc-ad)^2\text{Ei}\left(\frac{e}{c+dx}\right)}{d^3}-\frac{be(c+dx)(bc-ad)e^{\frac{e}{c+dx}}}{d^3}-\frac{b(c+dx)^2(bc-ad)e^{\frac{e}{c+dx}}}{d^3}+\frac{(c+dx)(bc-a}{d^3}$$

Antiderivative was successfully verified.

```
[In] Int[E^(e/(c + d*x))*(a + b*x)^2,x]
```

```
[Out] ((b*c - a*d)^2*E^(e/(c + d*x))*(c + d*x))/d^3 - (b*(b*c - a*d)*e*E^(e/(c +
d*x))*(c + d*x))/d^3 + (b^2*e^2*E^(e/(c + d*x))*(c + d*x))/(6*d^3) - (b*(b*
c - a*d)*E^(e/(c + d*x))*(c + d*x)^2)/d^3 + (b^2*e*E^(e/(c + d*x))*(c + d*x
)^2)/(6*d^3) + (b^2*E^(e/(c + d*x))*(c + d*x)^3)/(3*d^3) - ((b*c - a*d)^2*e
*ExpIntegralEi[e/(c + d*x)])/d^3 + (b*(b*c - a*d)*e^2*ExpIntegralEi[e/(c +
d*x)])/d^3 - (b^2*e^3*ExpIntegralEi[e/(c + d*x)])/(6*d^3)
```

Rule 2206

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[((c +
 d*x)*F^(a + b*(c + d*x)^n))/d, x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rule 2226

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int e^{\frac{e}{c+dx}}(a+bx)^2\,dx = \int\left(\frac{(-bc+ad)^2e^{\frac{e}{c+dx}}}{d^2} - \frac{2b(bc-ad)e^{\frac{e}{c+dx}}(c+dx)}{d^2} + \frac{b^2e^{\frac{e}{c+dx}}(c+dx)^2}{d^2}\right)dx$$

$$= \frac{b^2\int e^{\frac{e}{c+dx}}(c+dx)^2\,dx}{d^2} - \frac{(2b(bc-ad))\int e^{\frac{e}{c+dx}}(c+dx)\,dx}{d^2} + \frac{(bc-ad)^2\int e^{\frac{e}{c+dx}}\,dx}{d^2}$$

$$= \frac{(bc-ad)^2e^{\frac{e}{c+dx}}(c+dx)}{d^3} - \frac{b(bc-ad)e^{\frac{e}{c+dx}}(c+dx)^2}{d^3} + \frac{b^2e^{\frac{e}{c+dx}}(c+dx)^3}{3d^3} + \frac{\left(b^2e\right)\int e^{\frac{e}{c+dx}}(c+d}{3d^2}$$

$$= \frac{(bc-ad)^2e^{\frac{e}{c+dx}}(c+dx)}{d^3} - \frac{b(bc-ad)ee^{\frac{e}{c+dx}}(c+dx)}{d^3} - \frac{b(bc-ad)e^{\frac{e}{c+dx}}(c+dx)^2}{d^3} + \frac{b^2ee^{\frac{e}{c+dx}}(c}{6d^3}$$

$$= \frac{(bc-ad)^2e^{\frac{e}{c+dx}}(c+dx)}{d^3} - \frac{b(bc-ad)ee^{\frac{e}{c+dx}}(c+dx)}{d^3} + \frac{b^2e^2e^{\frac{e}{c+dx}}(c+dx)}{6d^3} - \frac{b(bc-ad)e^{\frac{e}{c+dx}}(c}{d^3}$$

$$= \frac{(bc-ad)^2e^{\frac{e}{c+dx}}(c+dx)}{d^3} - \frac{b(bc-ad)ee^{\frac{e}{c+dx}}(c+dx)}{d^3} + \frac{b^2e^2e^{\frac{e}{c+dx}}(c+dx)}{6d^3} - \frac{b(bc-ad)e^{\frac{e}{c+dx}}(c}{d^3}$$

Mathematica [A] time = 0.21, size = 170, normalized size = 0.67

$$\frac{dxe^{\frac{e}{c+dx}}\left(6a^2d^2+6abd(dx+e)+b^2\left(-4ce+2d^2x^2+dex+e^2\right)\right)-e\left(6a^2d^2+6abd(e-2c)+b^2\left(6c^2-6ce+e^2\right)\right)\text{E}}{6d^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(e/(c + d*x))*(a + b*x)^2,x]
```

```
[Out] (c*(6*a^2*d^2 + 6*a*b*d*(-c + e) + b^2*(2*c^2 - 5*c*e + e^2))*E^(e/(c + d*x
)))/(6*d^3) + (d*E^(e/(c + d*x))*x*(6*a^2*d^2 + 6*a*b*d*(e + d*x) + b^2*(-4
*c*e + e^2 + d*e*x + 2*d^2*x^2)) - e*(6*a^2*d^2 + 6*a*b*d*(-2*c + e) + b^2*
(6*c^2 - 6*c*e + e^2))*ExpIntegralEi[e/(c + d*x)])/(6*d^3)
```

fricas [A] time = 0.42, size = 197, normalized size = 0.77

$$-\frac{\left(b^2e^3-6\left(b^2c-abd\right)e^2+6\left(b^2c^2-2\,abcd+a^2d^2\right)e\right)\mathrm{Ei}\left(\frac{e}{dx+c}\right)-\left(2\,b^2d^3x^3+2\,b^2c^3-6\,abc^2d+6\,a^2cd^2+b^2ce^2\right.}{6\,d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))*(b*x+a)^2,x, algorithm="fricas")
```

```
[Out] -1/6*((b^2*e^3 - 6*(b^2*c - a*b*d)*e^2 + 6*(b^2*c^2 - 2*a*b*c*d + a^2*d^2)*
e)*Ei(e/(d*x + c)) - (2*b^2*d^3*x^3 + 2*b^2*c^3 - 6*a*b*c^2*d + 6*a^2*c*d^2
 + b^2*c*e^2 + (6*a*b*d^3 + b^2*d^2*e)*x^2 - (5*b^2*c^2 - 6*a*b*c*d)*e + (6
*a^2*d^3 + b^2*d*e^2 - 2*(2*b^2*c*d - 3*a*b*d^2)*e)*x)*e^(e/(d*x + c)))/d^3
```

giac [A] time = 0.55, size = 424, normalized size = 1.66

$$-\left(\frac{6\,b^2c^2\mathrm{Ei}\left(\frac{e}{dx+c}\right)e^5}{(dx+c)^3}-\frac{12\,abcd\mathrm{Ei}\left(\frac{e}{dx+c}\right)e^5}{(dx+c)^3}+\frac{6\,a^2d^2\mathrm{Ei}\left(\frac{e}{dx+c}\right)e^5}{(dx+c)^3}-2\,b^2e^{\left(\frac{e}{dx+c}+4\right)}+\frac{6\,b^2ce^{\left(\frac{e}{dx+c}+4\right)}}{dx+c}-\frac{6\,b^2c^2e^{\left(\frac{e}{dx+c}+4\right)}}{(dx+c)^2}-\frac{6\,abde^{\left(\frac{e}{dx+c}+4\right)}}{dx+c}+\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))*(b*x+a)^2,x, algorithm="giac")
```

```
[Out] -1/6*(6*b^2*c^2*Ei(e/(d*x + c))*e^5/(d*x + c)^3 - 12*a*b*c*d*Ei(e/(d*x + c)
)*e^5/(d*x + c)^3 + 6*a^2*d^2*Ei(e/(d*x + c))*e^5/(d*x + c)^3 - 2*b^2*e^(e/
(d*x + c) + 4) + 6*b^2*c*e^(e/(d*x + c) + 4)/(d*x + c) - 6*b^2*c^2*e^(e/(d*
x + c) + 4)/(d*x + c)^2 - 6*a*b*d*e^(e/(d*x + c) + 4)/(d*x + c) + 12*a*b*c*
d*e^(e/(d*x + c) + 4)/(d*x + c)^2 - 6*a^2*d^2*e^(e/(d*x + c) + 4)/(d*x + c)
^2 - 6*b^2*c*Ei(e/(d*x + c))*e^6/(d*x + c)^3 + 6*a*b*d*Ei(e/(d*x + c))*e^6/
(d*x + c)^3 - b^2*e^(e/(d*x + c) + 5)/(d*x + c) + 6*b^2*c*e^(e/(d*x + c) +
5)/(d*x + c)^2 - 6*a*b*d*e^(e/(d*x + c) + 5)/(d*x + c)^2 + b^2*Ei(e/(d*x +
c))*e^7/(d*x + c)^3 - b^2*e^(e/(d*x + c) + 6)/(d*x + c)^2)*(d*x + c)^3*e^(-
4)/d^3
```

maple [A] time = 0.02, size = 356, normalized size = 1.40

$$-\left(\left(-\mathrm{Ei}\left(1,-\frac{e}{dx+c}\right)-\frac{(dx+c)\mathrm{e}^{\frac{e}{dx+c}}}{e}\right)a^2-\frac{2\left(-\mathrm{Ei}\left(1,-\frac{e}{dx+c}\right)-\frac{(dx+c)\mathrm{e}^{\frac{e}{dx+c}}}{e}\right)abc}{d}+\frac{2\left(-\frac{\mathrm{Ei}\left(1,-\frac{e}{dx+c}\right)}{2}-\frac{(dx+c)\mathrm{e}^{\frac{e}{dx+c}}}{2e}-\frac{(dx+c)^2\mathrm{e}^{\frac{e}{dx+c}}}{2e^2}\right)abe}{d}+\frac{\left(-\mathrm{Ei}\left(1,\right.\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(1/(d*x+c)*e)*(b*x+a)^2,x)
```

```
[Out] -1/d*e*(a^2*(-(d*x+c)/e*exp(1/(d*x+c)*e)-Ei(1,-1/(d*x+c)*e))+b^2/d^2*e^2*(-
1/3*(d*x+c)^3/e^3*exp(1/(d*x+c)*e)-1/6*(d*x+c)^2/e^2*exp(1/(d*x+c)*e)-1/6*(
d*x+c)/e*exp(1/(d*x+c)*e)-1/6*Ei(1,-1/(d*x+c)*e))+b^2*c^2/d^2*(-(d*x+c)/e*e
xp(1/(d*x+c)*e)-Ei(1,-1/(d*x+c)*e))+2*b/d*e*a*(-1/2*(d*x+c)^2/e^2*exp(1/(d*
x+c)*e)-1/2*(d*x+c)/e*exp(1/(d*x+c)*e)-1/2*Ei(1,-1/(d*x+c)*e))-2*b^2/d^2*e*
c*(-1/2*(d*x+c)^2/e^2*exp(1/(d*x+c)*e)-1/2*(d*x+c)/e*exp(1/(d*x+c)*e)-1/2*E
i(1,-1/(d*x+c)*e))-2*b*c/d*a*(-(d*x+c)/e*exp(1/(d*x+c)*e)-Ei(1,-1/(d*x+c)*e
)))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\left(2\,b^2d^2x^3+\left(6\,abd^2+b^2de\right)x^2+\left(6\,a^2d^2+6\,abde-\left(4\,ce-e^2\right)b^2\right)x\right)e^{\left(\frac{e}{dx+c}\right)}}{6\,d^2}+\int-\frac{\left(6\,abc^2de-\left(4\,c^3e-c^2e^2\right)b^2-\left(6\,\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))*(b*x+a)^2,x, algorithm="maxima")
```

```
[Out] 1/6*(2*b^2*d^2*x^3 + (6*a*b*d^2 + b^2*d*e)*x^2 + (6*a^2*d^2 + 6*a*b*d*e - (
4*c*e - e^2)*b^2)*x)*e^(e/(d*x + c))/d^2 + integrate(-1/6*(6*a*b*c^2*d*e -
(4*c^3*e - c^2*e^2)*b^2 - (6*a^2*d^3*e - 6*(2*c*d^2*e - d^2*e^2)*a*b + (6*c
^2*d*e - 6*c*d*e^2 + d*e^3)*b^2)*x)*e^(e/(d*x + c))/(d^4*x^2 + 2*c*d^3*x +
c^2*d^2), x)
```

mupad [B] time = 4.10, size = 306, normalized size = 1.20

$$\frac{x\,\mathrm{e}^{\frac{e}{c+d\,x}}\left(2\,a^2\,c+\frac{\frac{b^2\,c^3}{3}-d\left(a\,b\,c^2-2\,a\,b\,c\,e\right)+\frac{b^2\,c\,e^2}{3}-\frac{3\,b^2\,c^2\,e}{2}}{d^2}\right)+\frac{\mathrm{e}^{\frac{e}{c+d\,x}}\left(\frac{b^2\,c^4}{3}-d\left(a\,b\,c^3-a\,b\,c^2\,e\right)-\frac{5\,b^2\,c^3\,e}{6}+a^2\,c^2\,d^2+\frac{b^2\,c^2\,e^2}{6}\right)}{d^3}+x^2\,\mathrm{e}^{\frac{e}{c+d\,x}}\left(\frac{\frac{b^2\,e^2}{6}\cdots}{\cdots}\right.}{c+d\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(c + d*x))*(a + b*x)^2,x)
```

```
[Out] (x*exp(e/(c + d*x))*(2*a^2*c + ((b^2*c^3)/3 - d*(a*b*c^2 - 2*a*b*c*e) + (b^
2*c*e^2)/3 - (3*b^2*c^2*e)/2)/d^2) + (exp(e/(c + d*x))*((b^2*c^4)/3 - d*(a*
b*c^3 - a*b*c^2*e) - (5*b^2*c^3*e)/6 + a^2*c^2*d^2 + (b^2*c^2*e^2)/6))/d^3
+ x^2*exp(e/(c + d*x))*(((b^2*e^2)/6 - (b^2*c*e)/2)/d + a^2*d + a*b*c + a*b
*e) + (b^2*d*x^4*exp(e/(c + d*x)))/3 + (b*x^3*exp(e/(c + d*x))*(6*a*d + 2*b
*c + b*e))/6)/(c + d*x) - (ei(e/(c + d*x))*((b^2*e^3)/6 + d*(a*b*e^2 - 2*a*
b*c*e) + a^2*d^2*e - b^2*c*e^2 + b^2*c^2*e))/d^3
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (a+bx)^2 e^{\frac{e}{c+dx}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))*(b*x+a)**2,x)
[Out] Integral((a + b*x)**2*exp(e/(c + d*x)), x)
```

3.404 $\int e^{\frac{e}{c+dx}}(a+bx)\,dx$

Optimal. Leaf size=125

$$\frac{e(bc-ad)\text{Ei}\left(\frac{e}{c+dx}\right)}{d^2}-\frac{(c+dx)(bc-ad)e^{\frac{e}{c+dx}}}{d^2}-\frac{be^2\text{Ei}\left(\frac{e}{c+dx}\right)}{2d^2}+\frac{be(c+dx)e^{\frac{e}{c+dx}}}{2d^2}+\frac{b(c+dx)^2e^{\frac{e}{c+dx}}}{2d^2}$$

```
[Out] -(-a*d+b*c)*exp(e/(d*x+c))*(d*x+c)/d^2+1/2*b*e*exp(e/(d*x+c))*(d*x+c)/d^2+1
/2*b*exp(e/(d*x+c))*(d*x+c)^2/d^2+(-a*d+b*c)*e*Ei(e/(d*x+c))/d^2-1/2*b*e^2*
Ei(e/(d*x+c))/d^2
```

Rubi [A] time = 0.13, antiderivative size = 125, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 4, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.235, Rules used = {2226, 2206, 2210, 2214}

$$\frac{e(bc-ad)\text{Ei}\left(\frac{e}{c+dx}\right)}{d^2}-\frac{(c+dx)(bc-ad)e^{\frac{e}{c+dx}}}{d^2}-\frac{be^2\text{Ei}\left(\frac{e}{c+dx}\right)}{2d^2}+\frac{be(c+dx)e^{\frac{e}{c+dx}}}{2d^2}+\frac{b(c+dx)^2e^{\frac{e}{c+dx}}}{2d^2}$$

Antiderivative was successfully verified.

```
[In] Int[E^(e/(c + d*x))*(a + b*x),x]
```

```
[Out] -(((b*c - a*d)*E^(e/(c + d*x))*(c + d*x))/d^2) + (b*e*E^(e/(c + d*x))*(c +
d*x))/(2*d^2) + (b*E^(e/(c + d*x))*(c + d*x)^2)/(2*d^2) + ((b*c - a*d)*e*Ex
pIntegralEi[e/(c + d*x)])/d^2 - (b*e^2*ExpIntegralEi[e/(c + d*x)])/(2*d^2)
```

Rule 2206

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[((c +
 d*x)*F^(a + b*(c + d*x)^n))/d, x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
```

```
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rule 2226

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int e^{\frac{e}{c+dx}}(a+bx)\,dx = \int\left(\frac{(-bc+ad)e^{\frac{e}{c+dx}}}{d}+\frac{be^{\frac{e}{c+dx}}(c+dx)}{d}\right)dx$$
$$= \frac{b\int e^{\frac{e}{c+dx}}(c+dx)\,dx}{d}+\frac{(-bc+ad)\int e^{\frac{e}{c+dx}}\,dx}{d}$$
$$= -\frac{(bc-ad)e^{\frac{e}{c+dx}}(c+dx)}{d^2}+\frac{be^{\frac{e}{c+dx}}(c+dx)^2}{2d^2}+\frac{(be)\int e^{\frac{e}{c+dx}}\,dx}{2d}+\frac{((-bc+ad)e)\int\frac{e^{\frac{e}{c+dx}}}{c+dx}\,dx}{d}$$
$$= -\frac{(bc-ad)e^{\frac{e}{c+dx}}(c+dx)}{d^2}+\frac{bee^{\frac{e}{c+dx}}(c+dx)}{2d^2}+\frac{be^{\frac{e}{c+dx}}(c+dx)^2}{2d^2}+\frac{(bc-ad)e\mathrm{Ei}\left(\frac{e}{c+dx}\right)}{d^2}+\frac{(be^2)}{}$$
$$= -\frac{(bc-ad)e^{\frac{e}{c+dx}}(c+dx)}{d^2}+\frac{bee^{\frac{e}{c+dx}}(c+dx)}{2d^2}+\frac{be^{\frac{e}{c+dx}}(c+dx)^2}{2d^2}+\frac{(bc-ad)e\mathrm{Ei}\left(\frac{e}{c+dx}\right)}{d^2}-\frac{be^2\mathrm{Ei}}{2}$$

Mathematica [A] time = 0.10, size = 91, normalized size = 0.73

$$\frac{dxe^{\frac{e}{c+dx}}(2ad+b(dx+e))-e(2ad+b(e-2c))\mathrm{Ei}\left(\frac{e}{c+dx}\right)}{2d^2}+\frac{ce^{\frac{e}{c+dx}}(2ad+b(e-c))}{2d^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(e/(c + d*x))*(a + b*x),x]
```

```
[Out] (c*(2*a*d + b*(-c + e))*E^(e/(c + d*x)))/(2*d^2) + (d*E^(e/(c + d*x))*x*(2*
a*d + b*(e + d*x)) - e*(2*a*d + b*(-2*c + e))*ExpIntegralEi[e/(c + d*x)])/(
2*d^2)
```

fricas [A] time = 0.40, size = 83, normalized size = 0.66

$$-\frac{\left(be^2-2\,(bc-ad)e\right)\mathrm{Ei}\left(\frac{e}{dx+c}\right)-\left(bd^2x^2-bc^2+2\,acd+bce+\left(2\,ad^2+bde\right)x\right)e^{\left(\frac{e}{dx+c}\right)}}{2\,d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))*(b*x+a),x, algorithm="fricas")
```

```
[Out] -1/2*((b*e^2 - 2*(b*c - a*d)*e)*Ei(e/(d*x + c)) - (b*d^2*x^2 - b*c^2 + 2*a*
c*d + b*c*e + (2*a*d^2 + b*d*e)*x)*e^(e/(d*x + c)))/d^2
```

giac [A] time = 0.44, size = 171, normalized size = 1.37

$$\frac{(dx+c)^2\left(\frac{2\,bc\mathrm{Ei}\left(\frac{e}{dx+c}\right)e^4}{(dx+c)^2}-\frac{2\,ad\mathrm{Ei}\left(\frac{e}{dx+c}\right)e^4}{(dx+c)^2}+be^{\left(\frac{e}{dx+c}+3\right)}-\frac{2\,bce^{\left(\frac{e}{dx+c}+3\right)}}{dx+c}+\frac{2\,ade^{\left(\frac{e}{dx+c}+3\right)}}{dx+c}-\frac{b\mathrm{Ei}\left(\frac{e}{dx+c}\right)e^5}{(dx+c)^2}+\frac{be^{\left(\frac{e}{dx+c}+4\right)}}{dx+c}\right)e^{(-3)}}{2\,d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))*(b*x+a),x, algorithm="giac")
```

```
[Out] 1/2*(d*x + c)^2*(2*b*c*Ei(e/(d*x + c))*e^4/(d*x + c)^2 - 2*a*d*Ei(e/(d*x +
c))*e^4/(d*x + c)^2 + b*e^(e/(d*x + c) + 3) - 2*b*c*e^(e/(d*x + c) + 3)/(d*
x + c) + 2*a*d*e^(e/(d*x + c) + 3)/(d*x + c) - b*Ei(e/(d*x + c))*e^5/(d*x +
 c)^2 + b*e^(e/(d*x + c) + 4)/(d*x + c))*e^(-3)/d^2
```

maple [A] time = 0.02, size = 150, normalized size = 1.20

$$-\frac{\left(\left(-\mathrm{Ei}\left(1,-\frac{e}{dx+c}\right)-\frac{(dx+c)\mathrm{e}^{\frac{e}{dx+c}}}{e}\right)a-\frac{\left(-\mathrm{Ei}\left(1,-\frac{e}{dx+c}\right)-\frac{(dx+c)\mathrm{e}^{\frac{e}{dx+c}}}{e}\right)bc}{d}+\frac{\left(-\frac{\mathrm{Ei}\left(1,-\frac{e}{dx+c}\right)}{2}-\frac{(dx+c)\mathrm{e}^{\frac{e}{dx+c}}}{2e}-\frac{(dx+c)^2\mathrm{e}^{\frac{e}{dx+c}}}{2e^2}\right)be}{d}\right)e}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(1/(d*x+c)*e)*(b*x+a),x)
```

```
[Out] -1/d*e*(a*(-(d*x+c)/e*exp(1/(d*x+c)*e)-Ei(1,-1/(d*x+c)*e))+b/d*e*(-1/2*(d*x
+c)^2/e^2*exp(1/(d*x+c)*e)-1/2*(d*x+c)/e*exp(1/(d*x+c)*e)-1/2*Ei(1,-1/(d*x+
c)*e))-b*c/d*(-(d*x+c)/e*exp(1/(d*x+c)*e)-Ei(1,-1/(d*x+c)*e)))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\left(bdx^2+(2\,ad+be)x\right)e^{\left(\frac{e}{dx+c}\right)}}{2\,d}+\int-\frac{\left(bc^2e-\left(2\,ad^2e-\left(2\,cde-de^2\right)b\right)x\right)e^{\left(\frac{e}{dx+c}\right)}}{2\left(d^3x^2+2\,cd^2x+c^2d\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))*(b*x+a),x, algorithm="maxima")
```

```
[Out] 1/2*(b*d*x^2 + (2*a*d + b*e)*x)*e^(e/(d*x + c))/d + integrate(-1/2*(b*c^2*e
 - (2*a*d^2*e - (2*c*d*e - d*e^2)*b)*x)*e^(e/(d*x + c))/(d^3*x^2 + 2*c*d^2*
x + c^2*d), x)
```

mupad [B] time = 3.67, size = 153, normalized size = 1.22

$$\frac{\frac{e^{\frac{e}{c+dx}}\left(2ac^2d-bc^3+bc^2e\right)}{2d^2}+x\,e^{\frac{e}{c+dx}}\left(2ac-\frac{\frac{bc^2}{2}-bce}{d}\right)+x^2\,e^{\frac{e}{c+dx}}\left(ad+\frac{bc}{2}+\frac{be}{2}\right)+\frac{bdx^3\,e^{\frac{e}{c+dx}}}{2}}{c+dx}-\frac{\mathrm{ei}\left(\frac{e}{c+dx}\right)\left(be^2+2ad\right.}{2d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(c + d*x))*(a + b*x),x)
```

```
[Out] ((exp(e/(c + d*x))*(2*a*c^2*d - b*c^3 + b*c^2*e))/(2*d^2) + x*exp(e/(c + d*
x))*(2*a*c - ((b*c^2)/2 - b*c*e)/d) + x^2*exp(e/(c + d*x))*(a*d + (b*c)/2 +
 (b*e)/2) + (b*d*x^3*exp(e/(c + d*x)))/2)/(c + d*x) - (ei(e/(c + d*x))*(b*e
^2 + 2*a*d*e - 2*b*c*e))/(2*d^2)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (a+bx)\,e^{\frac{e}{c+dx}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))*(b*x+a),x)
```

```
[Out] Integral((a + b*x)*exp(e/(c + d*x)), x)
```

3.405 $\int e^{\frac{e}{c+dx}}\,dx$

Optimal. Leaf size=37

$$\frac{(c+dx)e^{\frac{e}{c+dx}}}{d}-\frac{e\text{Ei}\left(\frac{e}{c+dx}\right)}{d}$$

```
[Out] exp(e/(d*x+c))*(d*x+c)/d-e*Ei(e/(d*x+c))/d
```

Rubi [A] time = 0.03, antiderivative size = 37, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182, Rules used = {2206, 2210}

$$\frac{(c+dx)e^{\frac{e}{c+dx}}}{d}-\frac{e\text{Ei}\left(\frac{e}{c+dx}\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Int[E^(e/(c + d*x)),x]
```

```
[Out] (E^(e/(c + d*x))*(c + d*x))/d - (e*ExpIntegralEi[e/(c + d*x)])/d
```

Rule 2206

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[((c + d*x)*F^(a + b*(c + d*x)^n))/d, x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a + b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && ILtQ[n, 0]
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\begin{aligned}\int e^{\frac{e}{c+dx}}\,dx &= \frac{e^{\frac{e}{c+dx}}(c+dx)}{d}+e\int\frac{e^{\frac{e}{c+dx}}}{c+dx}\,dx\\ &= \frac{e^{\frac{e}{c+dx}}(c+dx)}{d}-\frac{e\text{Ei}\left(\frac{e}{c+dx}\right)}{d}\end{aligned}$$

Mathematica [A] time = 0.01, size = 37, normalized size = 1.00

$$\frac{(c+dx)e^{\frac{e}{c+dx}}}{d}-\frac{e\text{Ei}\left(\frac{e}{c+dx}\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(e/(c + d*x)),x]
[Out] (E^(e/(c + d*x))*(c + d*x))/d - (e*ExpIntegralEi[e/(c + d*x)])/d
```

fricas [A] time = 0.40, size = 35, normalized size = 0.95

$$-\frac{e\text{Ei}\left(\frac{e}{dx+c}\right)-(dx+c)e^{\left(\frac{e}{dx+c}\right)}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)),x, algorithm="fricas")
[Out] -(e*Ei(e/(d*x + c)) - (d*x + c)*e^(e/(d*x + c)))/d
```

giac [A] time = 0.31, size = 49, normalized size = 1.32

$$-\frac{(dx+c)\left(\frac{\text{Ei}\left(\frac{e}{dx+c}\right)e^3}{dx+c}-e^{\left(\frac{e}{dx+c}+2\right)}\right)e^{(-2)}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)),x, algorithm="giac")
[Out] -(d*x + c)*(Ei(e/(d*x + c))*e^3/(d*x + c) - e^(e/(d*x + c) + 2))*e^(-2)/d
```

maple [A] time = 0.01, size = 42, normalized size = 1.14

$$-\frac{\left(-\text{Ei}\left(1,-\frac{e}{dx+c}\right)-\frac{(dx+c)\mathrm{e}^{\frac{e}{dx+c}}}{e}\right)e}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(1/(d*x+c)*e),x)
[Out] -1/d*e*(-(d*x+c)/e*exp(1/(d*x+c)*e)-Ei(1,-1/(d*x+c)*e))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$de\int \frac{xe^{\left(\frac{e}{dx+c}\right)}}{d^2x^2 + 2\,cdx + c^2}\,dx + xe^{\left(\frac{e}{dx+c}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)),x, algorithm="maxima")
```

```
[Out] d*e*integrate(x*e^(e/(d*x + c))/(d^2*x^2 + 2*c*d*x + c^2), x) + x*e^(e/(d*x
 + c))
```

mupad [B] time = 3.62, size = 44, normalized size = 1.19

$$x\,\mathrm{e}^{\frac{e}{c+d\,x}} - \frac{e\,\mathrm{ei}\left(\frac{e}{c+d\,x}\right) - c\,\mathrm{e}^{\frac{e}{c+d\,x}}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(c + d*x)),x)
```

```
[Out] x*exp(e/(c + d*x)) - (e*ei(e/(c + d*x)) - c*exp(e/(c + d*x)))/d
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int e^{\frac{e}{c+dx}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)),x)
```

```
[Out] Integral(exp(e/(c + d*x)), x)
```

3.406 $\int \frac{e^{\frac{e}{c+dx}}}{a+bx}\,dx$

Optimal. Leaf size=62

$$\frac{e^{\frac{be}{bc-ad}}\operatorname{Ei}\left(-\frac{de(a+bx)}{(bc-ad)(c+dx)}\right)}{b}-\frac{\operatorname{Ei}\left(\frac{e}{c+dx}\right)}{b}$$

```
[Out] -Ei(e/(d*x+c))/b+exp(b*e/(-a*d+b*c))*Ei(-d*e*(b*x+a)/(-a*d+b*c)/(d*x+c))/b
```

Rubi [A] time = 0.20, antiderivative size = 62, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.210, Rules used = {2222, 2210, 2228, 2178}

$$\frac{e^{\frac{be}{bc-ad}}\operatorname{Ei}\left(-\frac{de(a+bx)}{(bc-ad)(c+dx)}\right)}{b}-\frac{\operatorname{Ei}\left(\frac{e}{c+dx}\right)}{b}$$

Antiderivative was successfully verified.

```
[In] Int[E^(e/(c + d*x))/(a + b*x),x]
```

```
[Out] -(ExpIntegralEi[e/(c + d*x)]/b) + (E^((b*e)/(b*c - a*d))*ExpIntegralEi[-((d
*e*(a + b*x))/((b*c - a*d)*(c + d*x)))])/b
```

Rule 2178

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - (c*f)/d))*ExpIntegralEi[(f*g*(c + d*x)*Log[F])/d])/d, x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2222

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))/((e_.) + (f_.)*(x_)), x_Symbo
l] :> Dist[d/f, Int[F^(a + b/(c + d*x))/(c + d*x), x], x] - Dist[(d*e - c*f
)/f, Int[F^(a + b/(c + d*x))/((c + d*x)*(e + f*x)), x], x] /; FreeQ[{F, a,
b, c, d, e, f}, x] && NeQ[d*e - c*f, 0]
```

Rule 2228

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))/(((e_.) + (f_.)*(x_))*((g_.)
+ (h_.)*(x_))), x_Symbol] :> -Dist[d/(f*(d*g - c*h)), Subst[Int[F^(a - (b*h
)/(d*g - c*h) + (d*b*x)/(d*g - c*h))/x, x], x, (g + h*x)/(c + d*x)], x] /;
FreeQ[{F, a, b, c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$
\begin{aligned}
\int \frac{e^{\frac{e}{c+dx}}}{a+bx}\,dx &= \frac{d\int \frac{e^{\frac{e}{c+dx}}}{c+dx}\,dx}{b} - \frac{(-bc+ad)\int \frac{e^{\frac{e}{c+dx}}}{(a+bx)(c+dx)}\,dx}{b}\\
&= -\frac{\mathrm{Ei}\left(\frac{e}{c+dx}\right)}{b} + \frac{\mathrm{Subst}\left(\int \frac{\exp\left(-\frac{be}{-bc+ad}+\frac{dex}{-bc+ad}\right)}{x}\,dx, x, \frac{a+bx}{c+dx}\right)}{b}\\
&= -\frac{\mathrm{Ei}\left(\frac{e}{c+dx}\right)}{b} + \frac{e^{\frac{be}{bc-ad}}\,\mathrm{Ei}\left(-\frac{de(a+bx)}{(bc-ad)(c+dx)}\right)}{b}
\end{aligned}
$$

Mathematica [A] time = 0.07, size = 56, normalized size = 0.90

$$
\frac{e^{\frac{be}{bc-ad}}\,\mathrm{Ei}\left(e\left(\frac{b}{ad-bc}+\frac{1}{c+dx}\right)\right)-\mathrm{Ei}\left(\frac{e}{c+dx}\right)}{b}
$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(e/(c + d*x))/(a + b*x),x]
```

```
[Out] (-ExpIntegralEi[e/(c + d*x)] + E^((b*e)/(b*c - a*d))*ExpIntegralEi[e*(b/(-(
b*c) + a*d) + (c + d*x)^(-1))])/b
```

fricas [A] time = 0.42, size = 71, normalized size = 1.15

$$
\frac{\mathrm{Ei}\left(-\frac{bdex+ade}{bc^2-acd+\left(bcd-ad^2\right)x}\right)e^{\left(\frac{be}{bc-ad}\right)}-\mathrm{Ei}\left(\frac{e}{dx+c}\right)}{b}
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))/(b*x+a),x, algorithm="fricas")
```

```
[Out] (Ei(-(b*d*e*x + a*d*e)/(b*c^2 - a*c*d + (b*c*d - a*d^2)*x))*e^(b*e/(b*c - a
*d)) - Ei(e/(d*x + c)))/b
```

giac [B] time = 1.95, size = 492, normalized size = 7.94

$$\left(\frac{2\,b^2c^2\mathrm{Ei}\left(\frac{e}{dx+c}\right)e^3}{(dx+c)^2}-\frac{4\,abcd\mathrm{Ei}\left(\frac{e}{dx+c}\right)e^3}{(dx+c)^2}+\frac{2\,a^2d^2\mathrm{Ei}\left(\frac{e}{dx+c}\right)e^3}{(dx+c)^2}-\frac{2\,b^2c^2\mathrm{Ei}\left(-\frac{be-\frac{bce}{dx+c}+\frac{ade}{dx+c}}{bc-ad}\right)e^{\left(\frac{be}{bc-ad}+3\right)}}{(dx+c)^2}+\frac{4\,abcd\mathrm{Ei}\left(-\frac{be-\frac{bce}{dx+c}+\frac{ade}{dx+c}}{bc-ad}\right)e^{\left(\frac{be}{bc-ad}+3\right)}}{(dx+c)^2}-\cdots\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))/(b*x+a),x, algorithm="giac")
```

```
[Out] 1/2*(2*b^2*c^2*Ei(e/(d*x + c))*e^3/(d*x + c)^2 - 4*a*b*c*d*Ei(e/(d*x + c))*
e^3/(d*x + c)^2 + 2*a^2*d^2*Ei(e/(d*x + c))*e^3/(d*x + c)^2 - 2*b^2*c^2*Ei(
-(b*e - b*c*e/(d*x + c) + a*d*e/(d*x + c))/(b*c - a*d))*e^(b*e/(b*c - a*d)
+ 3)/(d*x + c)^2 + 4*a*b*c*d*Ei(-(b*e - b*c*e/(d*x + c) + a*d*e/(d*x + c))/
(b*c - a*d))*e^(b*e/(b*c - a*d) + 3)/(d*x + c)^2 - 2*a^2*d^2*Ei(-(b*e - b*c
*e/(d*x + c) + a*d*e/(d*x + c))/(b*c - a*d))*e^(b*e/(b*c - a*d) + 3)/(d*x +
 c)^2 + 2*b^2*c*Ei(e/(d*x + c))*e^4/(d*x + c)^2 - 2*a*b*d*Ei(e/(d*x + c))*e
^4/(d*x + c)^2 - b^2*e^(e/(d*x + c) + 3) - 2*b^2*c*e^(e/(d*x + c) + 3)/(d*x
 + c) + 2*a*b*d*e^(e/(d*x + c) + 3)/(d*x + c) + b^2*Ei(e/(d*x + c))*e^5/(d*
x + c)^2 - b^2*e^(e/(d*x + c) + 4)/(d*x + c))*(d*x + c)^2*e^(-4)/(b^3*d)
```

maple [A] time = 0.02, size = 79, normalized size = 1.27

$$-\frac{\left(\frac{d\,\mathrm{Ei}\left(1,-\frac{be}{ad-bc}-\frac{e}{dx+c}\right)\mathrm{e}^{-\frac{be}{ad-bc}}}{be}-\frac{d\,\mathrm{Ei}\left(1,-\frac{e}{dx+c}\right)}{be}\right)e}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(1/(d*x+c)*e)/(b*x+a),x)
```

```
[Out] -1/d*e*(d/b/e*exp(-b*e/(a*d-b*c))*Ei(1,-1/(d*x+c)*e-b*e/(a*d-b*c))-d/b/e*Ei
(1,-1/(d*x+c)*e))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{\left(\frac{e}{dx+c}\right)}}{bx+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))/(b*x+a),x, algorithm="maxima")
```

```
[Out] integrate(e^(e/(d*x + c))/(b*x + a), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{\mathrm{e}^{\frac{e}{c+d\,x}}}{a+b\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(c + d*x))/(a + b*x),x)
[Out] int(exp(e/(c + d*x))/(a + b*x), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{\frac{e}{c+dx}}}{a+bx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))/(b*x+a),x)
[Out] Integral(exp(e/(c + d*x))/(a + b*x), x)
```

3.407 $\int \frac{e^{\frac{e}{c+dx}}}{(a+bx)^2}\,dx$

Optimal. Leaf size=107

$$-\frac{dee^{\frac{be}{bc-ad}}\operatorname{Ei}\left(-\frac{de(a+bx)}{(bc-ad)(c+dx)}\right)}{(bc-ad)^2}-\frac{de^{\frac{e}{c+dx}}}{b(bc-ad)}-\frac{e^{\frac{e}{c+dx}}}{b(a+bx)}$$

```
[Out] -d*exp(e/(d*x+c))/b/(-a*d+b*c)-exp(e/(d*x+c))/b/(b*x+a)-d*e*exp(b*e/(-a*d+b
*c))*Ei(-d*e*(b*x+a)/(-a*d+b*c)/(d*x+c))/(-a*d+b*c)^2
```

Rubi [A] time = 0.54, antiderivative size = 107, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.368, Rules used = {2223, 6742, 2222, 2210, 2228, 2178, 2209}

$$-\frac{dee^{\frac{be}{bc-ad}}\operatorname{Ei}\left(-\frac{de(a+bx)}{(bc-ad)(c+dx)}\right)}{(bc-ad)^2}-\frac{de^{\frac{e}{c+dx}}}{b(bc-ad)}-\frac{e^{\frac{e}{c+dx}}}{b(a+bx)}$$

Antiderivative was successfully verified.

```
[In] Int[E^(e/(c + d*x))/(a + b*x)^2,x]
```

```
[Out] -((d*E^(e/(c + d*x)))/(b*(b*c - a*d))) - E^(e/(c + d*x))/(b*(a + b*x)) - (d
*e*E^((b*e)/(b*c - a*d))*ExpIntegralEi[-((d*e*(a + b*x))/((b*c - a*d)*(c +
d*x)))])/(b*c - a*d)^2
```

Rule 2178

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - (c*f)/d))*ExpIntegralEi[(f*g*(c + d*x)*Log[F])/d])/d, x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
```

```
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2222

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))/((e_.) + (f_.)*(x_)), x_Symbo
l] :> Dist[d/f, Int[F^(a + b/(c + d*x))/(c + d*x), x], x] - Dist[(d*e - c*f
)/f, Int[F^(a + b/(c + d*x))/((c + d*x)*(e + f*x)), x], x] /; FreeQ[{F, a,
b, c, d, e, f}, x] && NeQ[d*e - c*f, 0]
```

Rule 2223

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))*((e_.) + (f_.)*(x_))^(m_), x_
Symbol] :> Simp[((e + f*x)^(m + 1)*F^(a + b/(c + d*x)))/(f*(m + 1)), x] + D
ist[(b*d*Log[F])/(f*(m + 1)), Int[((e + f*x)^(m + 1)*F^(a + b/(c + d*x)))/(
c + d*x)^2, x], x] /; FreeQ[{F, a, b, c, d, e, f}, x] && NeQ[d*e - c*f, 0]
&& ILtQ[m, -1]
```

Rule 2228

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))/(((e_.) + (f_.)*(x_))*((g_.)
+ (h_.)*(x_))), x_Symbol] :> -Dist[d/(f*(d*g - c*h)), Subst[Int[F^(a - (b*h
)/(d*g - c*h) + (d*b*x)/(d*g - c*h))/x, x], x, (g + h*x)/(c + d*x)], x] /;
FreeQ[{F, a, b, c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int \frac{e^{\frac{e}{c+dx}}}{(a+bx)^2}\,dx = -\frac{e^{\frac{e}{c+dx}}}{b(a+bx)} - \frac{(de)\int \frac{e^{\frac{e}{c+dx}}}{(a+bx)(c+dx)^2}\,dx}{b}$$

$$= -\frac{e^{\frac{e}{c+dx}}}{b(a+bx)} - \frac{(de)\int \left(\frac{b^2 e^{\frac{e}{c+dx}}}{(bc-ad)^2(a+bx)} - \frac{de^{\frac{e}{c+dx}}}{(bc-ad)(c+dx)^2} - \frac{bde^{\frac{e}{c+dx}}}{(bc-ad)^2(c+dx)}\right)dx}{b}$$

$$= -\frac{e^{\frac{e}{c+dx}}}{b(a+bx)} - \frac{(bde)\int \frac{e^{\frac{e}{c+dx}}}{a+bx}\,dx}{(bc-ad)^2} + \frac{(d^2e)\int \frac{e^{\frac{e}{c+dx}}}{c+dx}\,dx}{(bc-ad)^2} + \frac{(d^2e)\int \frac{e^{\frac{e}{c+dx}}}{(c+dx)^2}\,dx}{b(bc-ad)}$$

$$= -\frac{de^{\frac{e}{c+dx}}}{b(bc-ad)} - \frac{e^{\frac{e}{c+dx}}}{b(a+bx)} - \frac{de\,\mathrm{Ei}\left(\frac{e}{c+dx}\right)}{(bc-ad)^2} - \frac{(d^2e)\int \frac{e^{\frac{e}{c+dx}}}{c+dx}\,dx}{(bc-ad)^2} - \frac{(de)\int \frac{e^{\frac{e}{c+dx}}}{(a+bx)(c+dx)}\,dx}{bc-ad}$$

$$= -\frac{de^{\frac{e}{c+dx}}}{b(bc-ad)} - \frac{e^{\frac{e}{c+dx}}}{b(a+bx)} - \frac{(de)\,\mathrm{Subst}\left(\int \frac{\exp\left(-\frac{be}{-bc+ad}+\frac{dex}{-bc+ad}\right)}{x}\,dx, x, \frac{a+bx}{c+dx}\right)}{(bc-ad)^2}$$

$$= -\frac{de^{\frac{e}{c+dx}}}{b(bc-ad)} - \frac{e^{\frac{e}{c+dx}}}{b(a+bx)} - \frac{dee^{\frac{be}{bc-ad}}\,\mathrm{Ei}\left(-\frac{de(a+bx)}{(bc-ad)(c+dx)}\right)}{(bc-ad)^2}$$

Mathematica [A] time = 0.17, size = 105, normalized size = 0.98

$$-\frac{dee^{\frac{be}{bc-ad}}\,\mathrm{Ei}\left(\frac{e}{c+dx} - \frac{be}{bc-ad}\right)}{(ad-bc)^2} - \frac{de^{\frac{e}{c+dx}}}{b(bc-ad)} - \frac{e^{\frac{e}{c+dx}}}{b(a+bx)}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(e/(c + d*x))/(a + b*x)^2,x]
```

```
[Out] -((d*E^(e/(c + d*x)))/(b*(b*c - a*d))) - E^(e/(c + d*x))/(b*(a + b*x)) - (d
*e*E^((b*e)/(b*c - a*d))*ExpIntegralEi[-((b*e)/(b*c - a*d)) + e/(c + d*x)])
/(-(b*c) + a*d)^2
```

fricas [A] time = 0.42, size = 154, normalized size = 1.44

$$-\frac{(bdex + ade)\mathrm{Ei}\left(-\frac{bdex+ade}{bc^2-acd+\left(bcd-ad^2\right)x}\right)e^{\left(\frac{be}{bc-ad}\right)} + \left(bc^2 - acd + \left(bcd - ad^2\right)x\right)e^{\left(\frac{e}{dx+c}\right)}}{ab^2c^2 - 2\,a^2bcd + a^3d^2 + \left(b^3c^2 - 2\,ab^2cd + a^2bd^2\right)x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))/(b*x+a)^2,x, algorithm="fricas")
```

```
[Out] -((b*d*e*x + a*d*e)*Ei(-(b*d*e*x + a*d*e)/(b*c^2 - a*c*d + (b*c*d - a*d^2)*
x))*e^(b*e/(b*c - a*d)) + (b*c^2 - a*c*d + (b*c*d - a*d^2)*x)*e^(e/(d*x + c
)))/(a*b^2*c^2 - 2*a^2*b*c*d + a^3*d^2 + (b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2
)*x)
```

giac [B] time = 0.34, size = 345, normalized size = 3.22

$$-\frac{\left(b\mathrm{Ei}\left(-\frac{be-\frac{bce}{dx+c}+\frac{ade}{dx+c}}{bc-ad}\right)e^{\left(\frac{be}{bc-ad}+3\right)}-\frac{bc\mathrm{Ei}\left(-\frac{be-\frac{bce}{dx+c}+\frac{ade}{dx+c}}{bc-ad}\right)e^{\left(\frac{be}{bc-ad}+3\right)}}{dx+c}+\frac{ad\mathrm{Ei}\left(-\frac{be-\frac{bce}{dx+c}+\frac{ade}{dx+c}}{bc-ad}\right)e^{\left(\frac{be}{bc-ad}+3\right)}}{dx+c}+bce^{\left(\frac{e}{dx+c}+2\right)}-ade^{\left(\frac{e}{dx+c}+2\right)}\right)}{b^3c^2e-\frac{b^3c^3e}{dx+c}-2\,ab^2cde+\frac{3\,ab^2c^2de}{dx+c}+a^2bd^2e-\frac{3\,a^2bcd^2e}{dx+c}+\frac{a^3d^3e}{dx+c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))/(b*x+a)^2,x, algorithm="giac")
```

```
[Out] -(b*Ei(-(b*e - b*c*e/(d*x + c) + a*d*e/(d*x + c))/(b*c - a*d))*e^(b*e/(b*c
- a*d) + 3) - b*c*Ei(-(b*e - b*c*e/(d*x + c) + a*d*e/(d*x + c))/(b*c - a*d)
)*e^(b*e/(b*c - a*d) + 3)/(d*x + c) + a*d*Ei(-(b*e - b*c*e/(d*x + c) + a*d*
e/(d*x + c))/(b*c - a*d))*e^(b*e/(b*c - a*d) + 3)/(d*x + c) + b*c*e^(e/(d*x
 + c) + 2) - a*d*e^(e/(d*x + c) + 2))*d*e^(-1)/(b^3*c^2*e - b^3*c^3*e/(d*x
+ c) - 2*a*b^2*c*d*e + 3*a*b^2*c^2*d*e/(d*x + c) + a^2*b*d^2*e - 3*a^2*b*c*
d^2*e/(d*x + c) + a^3*d^3*e/(d*x + c))
```

maple [A] time = 0.02, size = 97, normalized size = 0.91

$$-\frac{\left(-\mathrm{Ei}\left(1,-\frac{be}{ad-bc}-\frac{e}{dx+c}\right)\mathrm{e}^{-\frac{be}{ad-bc}}-\frac{\mathrm{e}^{\frac{e}{dx+c}}}{\frac{be}{ad-bc}+\frac{e}{dx+c}}\right)de}{\left(ad-bc\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(1/(d*x+c)*e)/(b*x+a)^2,x)
```

```
[Out] -d*e/(a*d-b*c)^2*(-exp(1/(d*x+c)*e)/(1/(d*x+c)*e+1/(a*d-b*c)*b*e)-exp(-1/(a
*d-b*c)*b*e)*Ei(1,-1/(a*d-b*c)*b*e-1/(d*x+c)*e))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{\left(\frac{e}{dx+c}\right)}}{\left(bx+a\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))/(b*x+a)^2,x, algorithm="maxima")
[Out] integrate(e^(e/(d*x + c))/(b*x + a)^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{e}^{\frac{e}{c+d\,x}}}{{\left(a+b\,x\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(c + d*x))/(a + b*x)^2,x)
[Out] int(exp(e/(c + d*x))/(a + b*x)^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{\frac{e}{c+dx}}}{\left(a+bx\right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))/(b*x+a)**2,x)
[Out] Integral(exp(e/(c + d*x))/(a + b*x)**2, x)
```

3.408 $\int \frac{e^{\frac{e}{c+dx}}}{(a+bx)^3}\,dx$

Optimal. Leaf size=240

$$\frac{bd^2e^2e^{\frac{be}{bc-ad}}\operatorname{Ei}\left(-\frac{de(a+bx)}{(bc-ad)(c+dx)}\right)}{2(bc-ad)^4}+\frac{d^2ee^{\frac{be}{bc-ad}}\operatorname{Ei}\left(-\frac{de(a+bx)}{(bc-ad)(c+dx)}\right)}{(bc-ad)^3}+\frac{d^2ee^{\frac{e}{c+dx}}}{2(bc-ad)^3}+\frac{d^2e^{\frac{e}{c+dx}}}{2b(bc-ad)^2}+\frac{dee^{\frac{e}{c+dx}}}{2(a+bx)(bc-ad)^2}-\frac{e^{\frac{e}{c+dx}}}{2b(a+bx)^2}$$

```
[Out] 1/2*d^2*exp(e/(d*x+c))/b/(-a*d+b*c)^2+1/2*d^2*e*exp(e/(d*x+c))/(-a*d+b*c)^3
-1/2*exp(e/(d*x+c))/b/(b*x+a)^2+1/2*d*e*exp(e/(d*x+c))/(-a*d+b*c)^2/(b*x+a)
+d^2*e*exp(b*e/(-a*d+b*c))*Ei(-d*e*(b*x+a)/(-a*d+b*c)/(d*x+c))/(-a*d+b*c)^3
+1/2*b*d^2*e^2*exp(b*e/(-a*d+b*c))*Ei(-d*e*(b*x+a)/(-a*d+b*c)/(d*x+c))/(-a*
d+b*c)^4
```

Rubi [A] time = 1.04, antiderivative size = 240, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 7, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.368$, Rules used = {2223, 6742, 2222, 2210, 2228, 2178, 2209}

$$\frac{bd^2e^2e^{\frac{be}{bc-ad}}\operatorname{Ei}\left(-\frac{de(a+bx)}{(bc-ad)(c+dx)}\right)}{2(bc-ad)^4}+\frac{d^2ee^{\frac{be}{bc-ad}}\operatorname{Ei}\left(-\frac{de(a+bx)}{(bc-ad)(c+dx)}\right)}{(bc-ad)^3}+\frac{d^2ee^{\frac{e}{c+dx}}}{2(bc-ad)^3}+\frac{d^2e^{\frac{e}{c+dx}}}{2b(bc-ad)^2}+\frac{dee^{\frac{e}{c+dx}}}{2(a+bx)(bc-ad)^2}-\frac{e^{\frac{e}{c+dx}}}{2b(a+bx)^2}$$

Antiderivative was successfully verified.

```
[In] Int[E^(e/(c + d*x))/(a + b*x)^3,x]
```

```
[Out] (d^2*E^(e/(c + d*x)))/(2*b*(b*c - a*d)^2) + (d^2*e*E^(e/(c + d*x)))/(2*(b*c
 - a*d)^3) - E^(e/(c + d*x))/(2*b*(a + b*x)^2) + (d*e*E^(e/(c + d*x)))/(2*(
b*c - a*d)^2*(a + b*x)) + (d^2*e*E^((b*e)/(b*c - a*d))*ExpIntegralEi[-((d*e
*(a + b*x))/((b*c - a*d)*(c + d*x)))])/(b*c - a*d)^3 + (b*d^2*e^2*E^((b*e)/
(b*c - a*d))*ExpIntegralEi[-((d*e*(a + b*x))/((b*c - a*d)*(c + d*x)))])/(2*
(b*c - a*d)^4)
```

Rule 2178

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - (c*f)/d))*ExpIntegralEi[(f*g*(c + d*x)*Log[F])/d])/d, x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
```

```
[d*e - c*f, 0]
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2222

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))/((e_.) + (f_.)*(x_)), x_Symbo
l] :> Dist[d/f, Int[F^(a + b/(c + d*x))/(c + d*x), x], x] - Dist[(d*e - c*f
)/f, Int[F^(a + b/(c + d*x))/((c + d*x)*(e + f*x)), x], x] /; FreeQ[{F, a,
b, c, d, e, f}, x] && NeQ[d*e - c*f, 0]
```

Rule 2223

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))*((e_.) + (f_.)*(x_))^(m_), x_
Symbol] :> Simp[((e + f*x)^(m + 1)*F^(a + b/(c + d*x)))/(f*(m + 1)), x] + D
ist[(b*d*Log[F])/(f*(m + 1)), Int[((e + f*x)^(m + 1)*F^(a + b/(c + d*x)))/(
c + d*x)^2, x], x] /; FreeQ[{F, a, b, c, d, e, f}, x] && NeQ[d*e - c*f, 0]
&& ILtQ[m, -1]
```

Rule 2228

```
Int[(F_)^((a_.) + (b_.)/((c_.) + (d_.)*(x_)))/(((e_.) + (f_.)*(x_))*((g_.)
+ (h_.)*(x_))), x_Symbol] :> -Dist[d/(f*(d*g - c*h)), Subst[Int[F^(a - (b*h
)/(d*g - c*h) + (d*b*x)/(d*g - c*h))/x, x], x, (g + h*x)/(c + d*x)], x] /;
FreeQ[{F, a, b, c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int \frac{e^{\frac{e}{c+dx}}}{(a+bx)^3}\,dx = -\frac{e^{\frac{e}{c+dx}}}{2b(a+bx)^2} - \frac{(de)\int \frac{e^{\frac{e}{c+dx}}}{(a+bx)^2(c+dx)^2}\,dx}{2b}$$

$$= -\frac{e^{\frac{e}{c+dx}}}{2b(a+bx)^2} - \frac{(de)\int \left(\frac{b^2e^{\frac{e}{c+dx}}}{(bc-ad)^2(a+bx)^2} - \frac{2b^2de^{\frac{e}{c+dx}}}{(bc-ad)^3(a+bx)} + \frac{d^2e^{\frac{e}{c+dx}}}{(bc-ad)^2(c+dx)^2} + \frac{2bd^2e^{\frac{e}{c+dx}}}{(bc-ad)^3(c+dx)}\right)dx}{2b}$$

$$= -\frac{e^{\frac{e}{c+dx}}}{2b(a+bx)^2} + \frac{\left(bd^2e\right)\int \frac{e^{\frac{e}{c+dx}}}{a+bx}\,dx}{(bc-ad)^3} - \frac{\left(d^3e\right)\int \frac{e^{\frac{e}{c+dx}}}{c+dx}\,dx}{(bc-ad)^3} - \frac{(bde)\int \frac{e^{\frac{e}{c+dx}}}{(a+bx)^2}\,dx}{2(bc-ad)^2} - \frac{\left(d^3e\right)\int \frac{e^{\frac{e}{c+dx}}}{(c+dx)^2}\,dx}{2b(bc-ad)^2}$$

$$= \frac{d^2e^{\frac{e}{c+dx}}}{2b(bc-ad)^2} - \frac{e^{\frac{e}{c+dx}}}{2b(a+bx)^2} + \frac{dee^{\frac{e}{c+dx}}}{2(bc-ad)^2(a+bx)} + \frac{d^2e\text{Ei}\left(\frac{e}{c+dx}\right)}{(bc-ad)^3} + \frac{\left(d^3e\right)\int \frac{e^{\frac{e}{c+dx}}}{c+dx}\,dx}{(bc-ad)^3} + \frac{\left(d^2e\right)\int}{(b}$$

$$= \frac{d^2e^{\frac{e}{c+dx}}}{2b(bc-ad)^2} - \frac{e^{\frac{e}{c+dx}}}{2b(a+bx)^2} + \frac{dee^{\frac{e}{c+dx}}}{2(bc-ad)^2(a+bx)} + \frac{\left(d^2e\right)\text{Subst}\left(\int \frac{\exp\left(-\frac{be}{-bc+ad}+\frac{dex}{-bc+ad}\right)}{x}\,dx, x, \frac{a+}{c+}\right.}{(bc-ad)^3}$$

$$= \frac{d^2e^{\frac{e}{c+dx}}}{2b(bc-ad)^2} - \frac{e^{\frac{e}{c+dx}}}{2b(a+bx)^2} + \frac{dee^{\frac{e}{c+dx}}}{2(bc-ad)^2(a+bx)} + \frac{d^2ee^{\frac{be}{bc-ad}}\text{Ei}\left(-\frac{de(a+bx)}{(bc-ad)(c+dx)}\right)}{(bc-ad)^3} + \frac{\left(b^2d^2e^2\right)\int \frac{e}{a}}{2(bc-a}$$

$$= \frac{d^2e^{\frac{e}{c+dx}}}{2b(bc-ad)^2} + \frac{d^2ee^{\frac{e}{c+dx}}}{2(bc-ad)^3} - \frac{e^{\frac{e}{c+dx}}}{2b(a+bx)^2} + \frac{dee^{\frac{e}{c+dx}}}{2(bc-ad)^2(a+bx)} + \frac{bd^2e^2\text{Ei}\left(\frac{e}{c+dx}\right)}{2(bc-ad)^4} + \frac{d^2ee^{\frac{be}{bc-ad}}\text{E}}{(b}$$

$$= \frac{d^2e^{\frac{e}{c+dx}}}{2b(bc-ad)^2} + \frac{d^2ee^{\frac{e}{c+dx}}}{2(bc-ad)^3} - \frac{e^{\frac{e}{c+dx}}}{2b(a+bx)^2} + \frac{dee^{\frac{e}{c+dx}}}{2(bc-ad)^2(a+bx)} + \frac{d^2ee^{\frac{be}{bc-ad}}\text{Ei}\left(-\frac{de(a+bx)}{(bc-ad)(c+dx)}\right)}{(bc-ad)^3}$$

$$= \frac{d^2e^{\frac{e}{c+dx}}}{2b(bc-ad)^2} + \frac{d^2ee^{\frac{e}{c+dx}}}{2(bc-ad)^3} - \frac{e^{\frac{e}{c+dx}}}{2b(a+bx)^2} + \frac{dee^{\frac{e}{c+dx}}}{2(bc-ad)^2(a+bx)} + \frac{d^2ee^{\frac{be}{bc-ad}}\text{Ei}\left(-\frac{de(a+bx)}{(bc-ad)(c+dx)}\right)}{(bc-ad)^3}$$

<u>Mathematica</u> [F] time = 0.48, size = 0, normalized size = 0.00

$$\int \frac{e^{\frac{e}{c+dx}}}{(a+bx)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[E^(e/(c + d*x))/(a + b*x)^3,x]
```

```
[Out] Integrate[E^(e/(c + d*x))/(a + b*x)^3, x]
```

fricas [B] time = 0.42, size = 517, normalized size = 2.15

$$\frac{\left(a^2bd^2e^2+\left(b^3d^2e^2+2\left(b^3cd^2-ab^2d^3\right)e\right)x^2+2\left(a^2bcd^2-a^3d^3\right)e+2\left(ab^2d^2e^2+2\left(ab^2cd^2-a^2bd^3\right)e\right)x\right)\mathrm{Ei}\left(-\frac{\cdots}{bc^2\cdots}\right.}{2\left(a^2b^4c^4-4\,a^3b^3c^3d+6\,a^4b^2c^2d^2-4\,a^5b\cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))/(b*x+a)^3,x, algorithm="fricas")
```

```
[Out] 1/2*((a^2*b*d^2*e^2 + (b^3*d^2*e^2 + 2*(b^3*c*d^2 - a*b^2*d^3)*e)*x^2 + 2*(
a^2*b*c*d^2 - a^3*d^3)*e + 2*(a*b^2*d^2*e^2 + 2*(a*b^2*c*d^2 - a^2*b*d^3)*e
)*x)*Ei(-(b*d*e*x + a*d*e)/(b*c^2 - a*c*d + (b*c*d - a*d^2)*x))*e^(b*e/(b*c
 - a*d)) - (b^3*c^4 - 4*a*b^2*c^3*d + 5*a^2*b*c^2*d^2 - 2*a^3*c*d^3 - (b^3*
c^2*d^2 - 2*a*b^2*c*d^3 + a^2*b*d^4 + (b^3*c*d^2 - a*b^2*d^3)*e)*x^2 - (a*b
^2*c^2*d - a^2*b*c*d^2)*e - (2*a*b^2*c^2*d^2 - 4*a^2*b*c*d^3 + 2*a^3*d^4 +
(b^3*c^2*d - a^2*b*d^3)*e)*x)*e^(e/(d*x + c)))/(a^2*b^4*c^4 - 4*a^3*b^3*c^3
*d + 6*a^4*b^2*c^2*d^2 - 4*a^5*b*c*d^3 + a^6*d^4 + (b^6*c^4 - 4*a*b^5*c^3*d
 + 6*a^2*b^4*c^2*d^2 - 4*a^3*b^3*c*d^3 + a^4*b^2*d^4)*x^2 + 2*(a*b^5*c^4 -
4*a^2*b^4*c^3*d + 6*a^3*b^3*c^2*d^2 - 4*a^4*b^2*c*d^3 + a^5*b*d^4)*x)
```

giac [B] time = 0.53, size = 1759, normalized size = 7.33

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))/(b*x+a)^3,x, algorithm="giac")
```

```
[Out] 1/2*(2*b^3*c*d*Ei(-(b*e - b*c*e/(d*x + c) + a*d*e/(d*x + c))/(b*c - a*d))*e
^(b*e/(b*c - a*d) + 4) - 4*b^3*c^2*d*Ei(-(b*e - b*c*e/(d*x + c) + a*d*e/(d*
x + c))/(b*c - a*d))*e^(b*e/(b*c - a*d) + 4)/(d*x + c) + 2*b^3*c^3*d*Ei(-(b
*e - b*c*e/(d*x + c) + a*d*e/(d*x + c))/(b*c - a*d))*e^(b*e/(b*c - a*d) + 4
)/(d*x + c)^2 - 2*a*b^2*d^2*Ei(-(b*e - b*c*e/(d*x + c) + a*d*e/(d*x + c))/(
b*c - a*d))*e^(b*e/(b*c - a*d) + 4) + 8*a*b^2*c*d^2*Ei(-(b*e - b*c*e/(d*x +
 c) + a*d*e/(d*x + c))/(b*c - a*d))*e^(b*e/(b*c - a*d) + 4)/(d*x + c) - 6*a
*b^2*c^2*d^2*Ei(-(b*e - b*c*e/(d*x + c) + a*d*e/(d*x + c))/(b*c - a*d))*e^(
b*e/(b*c - a*d) + 4)/(d*x + c)^2 - 4*a^2*b*d^3*Ei(-(b*e - b*c*e/(d*x + c) +
 a*d*e/(d*x + c))/(b*c - a*d))*e^(b*e/(b*c - a*d) + 4)/(d*x + c) + 6*a^2*b*
c*d^3*Ei(-(b*e - b*c*e/(d*x + c) + a*d*e/(d*x + c))/(b*c - a*d))*e^(b*e/(b*
c - a*d) + 4)/(d*x + c)^2 - 2*a^3*d^4*Ei(-(b*e - b*c*e/(d*x + c) + a*d*e/(d
*x + c))/(b*c - a*d))*e^(b*e/(b*c - a*d) + 4)/(d*x + c)^2 + b^3*c^2*d*e^(e/
(d*x + c) + 3) - 2*b^3*c^3*d*e^(e/(d*x + c) + 3)/(d*x + c) - 2*a*b^2*c*d^2*
e^(e/(d*x + c) + 3) + 6*a*b^2*c^2*d^2*e^(e/(d*x + c) + 3)/(d*x + c) + a^2*b
*d^3*e^(e/(d*x + c) + 3) - 6*a^2*b*c*d^3*e^(e/(d*x + c) + 3)/(d*x + c) + 2*
```

```
a^3*d^4*e^(e/(d*x + c) + 3)/(d*x + c) + b^3*d*Ei(-(b*e - b*c*e/(d*x + c) +
a*d*e/(d*x + c))/(b*c - a*d))*e^(b*e/(b*c - a*d) + 5) - 2*b^3*c*d*Ei(-(b*e
- b*c*e/(d*x + c) + a*d*e/(d*x + c))/(b*c - a*d))*e^(b*e/(b*c - a*d) + 5)/(
d*x + c) + b^3*c^2*d*Ei(-(b*e - b*c*e/(d*x + c) + a*d*e/(d*x + c))/(b*c - a
*d))*e^(b*e/(b*c - a*d) + 5)/(d*x + c)^2 + 2*a*b^2*d^2*Ei(-(b*e - b*c*e/(d*
x + c) + a*d*e/(d*x + c))/(b*c - a*d))*e^(b*e/(b*c - a*d) + 5)/(d*x + c) -
2*a*b^2*c*d^2*Ei(-(b*e - b*c*e/(d*x + c) + a*d*e/(d*x + c))/(b*c - a*d))*e^
(b*e/(b*c - a*d) + 5)/(d*x + c)^2 + a^2*b*d^3*Ei(-(b*e - b*c*e/(d*x + c) +
a*d*e/(d*x + c))/(b*c - a*d))*e^(b*e/(b*c - a*d) + 5)/(d*x + c)^2 + b^3*c*d
*e^(e/(d*x + c) + 4) - b^3*c^2*d*e^(e/(d*x + c) + 4)/(d*x + c) - a*b^2*d^2*
e^(e/(d*x + c) + 4) + 2*a*b^2*c*d^2*e^(e/(d*x + c) + 4)/(d*x + c) - a^2*b*d
^3*e^(e/(d*x + c) + 4)/(d*x + c))*d*e^(-1)/(b^6*c^4*e^2 - 2*b^6*c^5*e^2/(d*
x + c) + b^6*c^6*e^2/(d*x + c)^2 - 4*a*b^5*c^3*d*e^2 + 10*a*b^5*c^4*d*e^2/(
d*x + c) - 6*a*b^5*c^5*d*e^2/(d*x + c)^2 + 6*a^2*b^4*c^2*d^2*e^2 - 20*a^2*b
^4*c^3*d^2*e^2/(d*x + c) + 15*a^2*b^4*c^4*d^2*e^2/(d*x + c)^2 - 4*a^3*b^3*c
*d^3*e^2 + 20*a^3*b^3*c^2*d^3*e^2/(d*x + c) - 20*a^3*b^3*c^3*d^3*e^2/(d*x +
 c)^2 + a^4*b^2*d^4*e^2 - 10*a^4*b^2*c*d^4*e^2/(d*x + c) + 15*a^4*b^2*c^2*d
^4*e^2/(d*x + c)^2 + 2*a^5*b*d^5*e^2/(d*x + c) - 6*a^5*b*c*d^5*e^2/(d*x + c
)^2 + a^6*d^6*e^2/(d*x + c)^2)
```

maple [A] time = 0.02, size = 240, normalized size = 1.00

$$-\frac{\left(-\frac{\left(-\frac{\mathrm{Ei}\left(1,-\frac{be}{ad-bc}-\frac{e}{dx+c}\right)\mathrm{e}^{-\frac{be}{ad-bc}}}{2}-\frac{\mathrm{e}^{\frac{e}{dx+c}}}{2\left(\frac{be}{ad-bc}+\frac{e}{dx+c}\right)^{2}}-\frac{\mathrm{e}^{\frac{e}{dx+c}}}{2\left(\frac{be}{ad-bc}+\frac{e}{dx+c}\right)}\right)b\,d^{3}e}{(ad-bc)^{4}}+\frac{\left(-\mathrm{Ei}\left(1,-\frac{be}{ad-bc}-\frac{e}{dx+c}\right)\mathrm{e}^{-\frac{be}{ad-bc}}-\frac{\mathrm{e}^{\frac{e}{dx+c}}}{\frac{be}{ad-bc}+\frac{e}{dx+c}}\right)d^{3}}{(ad-bc)^{3}}\right)e}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(1/(d*x+c)*e)/(b*x+a)^3,x)
```

```
[Out] -1/d*e*(-1/(a*d-b*c)^4*b*e*d^3*(-1/2*exp(1/(d*x+c)*e)/(1/(a*d-b*c)*b*e+1/(d
*x+c)*e)^2-1/2/(1/(a*d-b*c)*b*e+1/(d*x+c)*e)*exp(1/(d*x+c)*e)-1/2*exp(-1/(a
*d-b*c)*b*e)*Ei(1,-1/(a*d-b*c)*b*e-1/(d*x+c)*e))+d^3/(a*d-b*c)^3*(-1/(1/(a*
d-b*c)*b*e+1/(d*x+c)*e)*exp(1/(d*x+c)*e)-exp(-1/(a*d-b*c)*b*e)*Ei(1,-1/(a*d
-b*c)*b*e-1/(d*x+c)*e)))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{\left(\frac{e}{dx+c}\right)}}{(bx+a)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))/(b*x+a)^3,x, algorithm="maxima")
```

```
[Out] integrate(e^(e/(d*x + c))/(b*x + a)^3, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{e}^{\frac{e}{c+d\,x}}}{{\left(a+b\,x\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(c + d*x))/(a + b*x)^3,x)
```

```
[Out] int(exp(e/(c + d*x))/(a + b*x)^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{\frac{e}{c+dx}}}{(a+bx)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c))/(b*x+a)**3,x)
```

```
[Out] Integral(exp(e/(c + d*x))/(a + b*x)**3, x)
```

3.409 $\int e^{\frac{e}{(c+dx)^2}}(a+bx)^3\,dx$

Optimal. Leaf size=322

$$\frac{2\sqrt{\pi}\,b^2e^{3/2}(bc-ad)\text{erfi}\left(\frac{\sqrt{e}}{c+dx}\right)}{d^4}-\frac{b^2(c+dx)^3(bc-ad)e^{\frac{e}{(c+dx)^2}}}{d^4}-\frac{2b^2e(c+dx)(bc-ad)e^{\frac{e}{(c+dx)^2}}}{d^4}+\frac{\sqrt{\pi}\,\sqrt{e}\,(bc-ad)^3\text{erfi}\left(\right.}{d^4}$$

```
[Out] -(-a*d+b*c)^3*exp(e/(d*x+c)^2)*(d*x+c)/d^4-2*b^2*(-a*d+b*c)*e*exp(e/(d*x+c)
^2)*(d*x+c)/d^4+3/2*b*(-a*d+b*c)^2*exp(e/(d*x+c)^2)*(d*x+c)^2/d^4+1/4*b^3*e
*exp(e/(d*x+c)^2)*(d*x+c)^2/d^4-b^2*(-a*d+b*c)*exp(e/(d*x+c)^2)*(d*x+c)^3/d
^4+1/4*b^3*exp(e/(d*x+c)^2)*(d*x+c)^4/d^4-3/2*b*(-a*d+b*c)^2*e*Ei(e/(d*x+c)
^2)/d^4-1/4*b^3*e^2*Ei(e/(d*x+c)^2)/d^4+2*b^2*(-a*d+b*c)*e^(3/2)*erfi(e^(1/
2)/(d*x+c))*Pi^(1/2)/d^4+(-a*d+b*c)^3*erfi(e^(1/2)/(d*x+c))*e^(1/2)*Pi^(1/2
)/d^4
```

Rubi [A] time = 0.34, antiderivative size = 322, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 6, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.316, Rules used = {2226, 2206, 2211, 2204, 2214, 2210}

$$\frac{2\sqrt{\pi}\,b^2e^{3/2}(bc-ad)\text{Erfi}\left(\frac{\sqrt{e}}{c+dx}\right)}{d^4}-\frac{b^2(c+dx)^3(bc-ad)e^{\frac{e}{(c+dx)^2}}}{d^4}-\frac{2b^2e(c+dx)(bc-ad)e^{\frac{e}{(c+dx)^2}}}{d^4}+\frac{\sqrt{\pi}\,\sqrt{e}\,(bc-ad)^3\text{Erfi}}{d^4}$$

Antiderivative was successfully verified.

```
[In] Int[E^(e/(c + d*x)^2)*(a + b*x)^3,x]
```

```
[Out] -(((b*c - a*d)^3*E^(e/(c + d*x)^2)*(c + d*x))/d^4) - (2*b^2*(b*c - a*d)*e*E
^(e/(c + d*x)^2)*(c + d*x))/d^4 + (3*b*(b*c - a*d)^2*E^(e/(c + d*x)^2)*(c +
 d*x)^2)/(2*d^4) + (b^3*e*E^(e/(c + d*x)^2)*(c + d*x)^2)/(4*d^4) - (b^2*(b*
c - a*d)*E^(e/(c + d*x)^2)*(c + d*x)^3)/d^4 + (b^3*E^(e/(c + d*x)^2)*(c + d
*x)^4)/(4*d^4) + ((b*c - a*d)^3*Sqrt[e]*Sqrt[Pi]*Erfi[Sqrt[e]/(c + d*x)])/d
^4 + (2*b^2*(b*c - a*d)*e^(3/2)*Sqrt[Pi]*Erfi[Sqrt[e]/(c + d*x)])/d^4 - (3*
b*(b*c - a*d)^2*e*ExpIntegralEi[e/(c + d*x)^2])/(2*d^4) - (b^3*e^2*ExpInteg
ralEi[e/(c + d*x)^2])/(4*d^4)
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2206

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[((c +
 d*x)*F^(a + b*(c + d*x)^n))/d, x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
```

```
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2211

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rule 2226

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int e^{\frac{e}{(c+dx)^2}}(a+bx)^3\,dx = \int \left(\frac{(-bc+ad)^3 e^{\frac{e}{(c+dx)^2}}}{d^3} + \frac{3b(bc-ad)^2 e^{\frac{e}{(c+dx)^2}}(c+dx)}{d^3} - \frac{3b^2(bc-ad)e^{\frac{e}{(c+dx)^2}}(c+dx)^2}{d^3} + \frac{b^3}{}\right.$$

$$= \frac{b^3 \int e^{\frac{e}{(c+dx)^2}}(c+dx)^3\,dx}{d^3} - \frac{\left(3b^2(bc-ad)\right)\int e^{\frac{e}{(c+dx)^2}}(c+dx)^2\,dx}{d^3} + \frac{\left(3b(bc-ad)^2\right)\int e^{\frac{e}{(c+dx)^2}}}{d^3}$$

$$= -\frac{(bc-ad)^3 e^{\frac{e}{(c+dx)^2}}(c+dx)}{d^4} + \frac{3b(bc-ad)^2 e^{\frac{e}{(c+dx)^2}}(c+dx)^2}{2d^4} - \frac{b^2(bc-ad)e^{\frac{e}{(c+dx)^2}}(c+dx)^3}{d^4} +$$

$$= -\frac{(bc-ad)^3 e^{\frac{e}{(c+dx)^2}}(c+dx)}{d^4} - \frac{2b^2(bc-ad)ee^{\frac{e}{(c+dx)^2}}(c+dx)}{d^4} + \frac{3b(bc-ad)^2 e^{\frac{e}{(c+dx)^2}}(c+dx)^2}{2d^4}$$

$$= -\frac{(bc-ad)^3 e^{\frac{e}{(c+dx)^2}}(c+dx)}{d^4} - \frac{2b^2(bc-ad)ee^{\frac{e}{(c+dx)^2}}(c+dx)}{d^4} + \frac{3b(bc-ad)^2 e^{\frac{e}{(c+dx)^2}}(c+dx)^2}{2d^4}$$

$$= -\frac{(bc-ad)^3 e^{\frac{e}{(c+dx)^2}}(c+dx)}{d^4} - \frac{2b^2(bc-ad)ee^{\frac{e}{(c+dx)^2}}(c+dx)}{d^4} + \frac{3b(bc-ad)^2 e^{\frac{e}{(c+dx)^2}}(c+dx)^2}{2d^4}$$

Mathematica [A] time = 0.34, size = 243, normalized size = 0.75

$$\frac{4\sqrt{\pi}\sqrt{e}(bc-ad)\left(a^2d^2-2abcd+b^2\left(c^2+2e\right)\right)\text{erfi}\left(\frac{\sqrt{e}}{c+dx}\right) - be\left(6a^2d^2-12abcd+b^2\left(6c^2+e\right)\right)\text{Ei}\left(\frac{e}{(c+dx)^2}\right) + dxe}{4d^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(e/(c + d*x)^2)*(a + b*x)^3,x]
```

```
[Out] -1/4*(c*(6*a^2*b*c*d^2 - 4*a^3*d^3 - 4*a*b^2*d*(c^2 + 2*e) + b^3*(c^3 + 7*c
*e))*E^(e/(c + d*x)^2))/d^4 + (d*E^(e/(c + d*x)^2)*x*(4*a^3*d^3 + 6*a^2*b*d
^3*x + 4*a*b^2*d*(2*e + d^2*x^2) + b^3*(-6*c*e + d*e*x + d^3*x^3)) + 4*(b*c
 - a*d)*Sqrt[e]*(-2*a*b*c*d + a^2*d^2 + b^2*(c^2 + 2*e))*Sqrt[Pi]*Erfi[Sqrt
[e]/(c + d*x)] - b*e*(-12*a*b*c*d + 6*a^2*d^2 + b^2*(6*c^2 + e))*ExpIntegra
lEi[e/(c + d*x)^2])/(4*d^4)
```

fricas [A] time = 0.42, size = 311, normalized size = 0.97

$$-\frac{4\sqrt{\pi}\left(b^3c^3d-3ab^2c^2d^2+3a^2bcd^3-a^3d^4+2\left(b^3cd-ab^2d^2\right)e\right)\sqrt{-\frac{e}{d^2}}\ \text{erf}\left(\frac{d\sqrt{-\frac{e}{d^2}}}{dx+c}\right) + \left(b^3e^2+6\left(b^3c^2-2ab^2cd+\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^2)*(b*x+a)^3,x, algorithm="fricas")
```

```
[Out] -1/4*(4*sqrt(pi)*(b^3*c^3*d - 3*a*b^2*c^2*d^2 + 3*a^2*b*c*d^3 - a^3*d^4 + 2
*(b^3*c*d - a*b^2*d^2)*e)*sqrt(-e/d^2)*erf(d*sqrt(-e/d^2)/(d*x + c)) + (b^3
*e^2 + 6*(b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*e)*Ei(e/(d^2*x^2 + 2*c*d*x + c
^2)) - (b^3*d^4*x^4 + 4*a*b^2*d^4*x^3 - b^3*c^4 + 4*a*b^2*c^3*d - 6*a^2*b*c
^2*d^2 + 4*a^3*c*d^3 + (6*a^2*b*d^4 + b^3*d^2*e)*x^2 - (7*b^3*c^2 - 8*a*b^2
*c*d)*e + 2*(2*a^3*d^4 - (3*b^3*c*d - 4*a*b^2*d^2)*e)*x)*e^(e/(d^2*x^2 + 2*
c*d*x + c^2)))/d^4
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (bx+a)^3 e^{\left(\frac{e}{(dx+c)^2}\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^2)*(b*x+a)^3,x, algorithm="giac")
```

```
[Out] integrate((b*x + a)^3*e^(e/(d*x + c)^2), x)
```

maple [A] time = 0.03, size = 560, normalized size = 1.74

$$-\frac{\left(\frac{\sqrt{\pi}\, e \,\mathrm{erf}\left(\frac{\sqrt{-e}}{dx+c}\right)}{\sqrt{-e}}-(dx+c)\,\mathrm{e}^{\frac{e}{(dx+c)^2}}\right)a^3-\frac{3\left(\frac{\sqrt{\pi}\, e \,\mathrm{erf}\left(\frac{\sqrt{-e}}{dx+c}\right)}{\sqrt{-e}}-(dx+c)\mathrm{e}^{\frac{e}{(dx+c)^2}}\right)a^2bc}{d}+\frac{3\left(\frac{\sqrt{\pi}\, e \,\mathrm{erf}\left(\frac{\sqrt{-e}}{dx+c}\right)}{\sqrt{-e}}-(dx+c)\mathrm{e}^{\frac{e}{(dx+c)^2}}\right)a\,b^2c^2}{d^2}-\cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(d*x+c)^2)*(b*x+a)^3,x)
```

```
[Out] -1/d*(a^3*(-(d*x+c)*exp(e/(d*x+c)^2)+e*Pi^(1/2)/(-e)^(1/2)*erf((-e)^(1/2)/(
d*x+c)))+b^3/d^3*(-1/4*(d*x+c)^4*exp(e/(d*x+c)^2)+1/2*e*(-1/2*exp(e/(d*x+c)
^2)*(d*x+c)^2-1/2*e*Ei(1,-e/(d*x+c)^2)))+3*b^2/d^2*a*(-1/3*(d*x+c)^3*exp(e/
(d*x+c)^2)+2/3*e*(-(d*x+c)*exp(e/(d*x+c)^2)+e*Pi^(1/2)/(-e)^(1/2)*erf((-e)^
(1/2)/(d*x+c))))-3*b^3/d^3*c*(-1/3*(d*x+c)^3*exp(e/(d*x+c)^2)+2/3*e*(-(d*x+
c)*exp(e/(d*x+c)^2)+e*Pi^(1/2)/(-e)^(1/2)*erf((-e)^(1/2)/(d*x+c))))+3*b/d*a
^2*(-1/2*exp(e/(d*x+c)^2)*(d*x+c)^2-1/2*e*Ei(1,-e/(d*x+c)^2))+3*b^3/d^3*c^2
*(-1/2*exp(e/(d*x+c)^2)*(d*x+c)^2-1/2*e*Ei(1,-e/(d*x+c)^2))-b^3*c^3/d^3*(-(
```

```
d*x+c)*exp(e/(d*x+c)^2)+e*Pi^(1/2)/(-e)^(1/2)*erf((-e)^(1/2)/(d*x+c)))-6*b^
2/d^2*c*a*(-1/2*exp(e/(d*x+c)^2)*(d*x+c)^2-1/2*e*Ei(1,-e/(d*x+c)^2))-3*b*c/
d*a^2*(-(d*x+c)*exp(e/(d*x+c)^2)+e*Pi^(1/2)/(-e)^(1/2)*erf((-e)^(1/2)/(d*x+
c)))+3*b^2*c^2/d^2*a*(-(d*x+c)*exp(e/(d*x+c)^2)+e*Pi^(1/2)/(-e)^(1/2)*erf((
-e)^(1/2)/(d*x+c))))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\left(b^3d^3x^4 + 4\,ab^2d^3x^3 + \left(6\,a^2bd^3 + b^3de\right)x^2 + 2\left(2\,a^3d^3 - 3\,b^3ce + 4\,ab^2de\right)x\right)e^{\left(\frac{e}{d^2x^2+2\,cdx+c^2}\right)}}{4\,d^3} + \int \frac{\left(3\,b^3c^4e - 4\,ab^2c^3de\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^2)*(b*x+a)^3,x, algorithm="maxima")
```

```
[Out] 1/4*(b^3*d^3*x^4 + 4*a*b^2*d^3*x^3 + (6*a^2*b*d^3 + b^3*d*e)*x^2 + 2*(2*a^3
*d^3 - 3*b^3*c*e + 4*a*b^2*d*e)*x)*e^(e/(d^2*x^2 + 2*c*d*x + c^2))/d^3 + in
tegrate(1/2*(3*b^3*c^4*e - 4*a*b^2*c^3*d*e - (12*a*b^2*c*d^3*e - 6*a^2*b*d^
4*e - (6*c^2*d^2*e + d^2*e^2)*b^3)*x^2 + 2*(2*a^3*d^4*e - 2*(3*c^2*d^2*e -
2*d^2*e^2)*a*b^2 + (4*c^3*d*e - 3*c*d*e^2)*b^3)*x)*e^(e/(d^2*x^2 + 2*c*d*x
+ c^2))/(d^6*x^3 + 3*c*d^5*x^2 + 3*c^2*d^4*x + c^3*d^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \mathrm{e}^{\frac{e}{(c+d\,x)^2}}\,(a+b\,x)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(c + d*x)^2)*(a + b*x)^3,x)
```

```
[Out] int(exp(e/(c + d*x)^2)*(a + b*x)^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (a+bx)^3\, e^{\frac{e}{c^2+2cdx+d^2x^2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)**2)*(b*x+a)**3,x)
```

```
[Out] Integral((a + b*x)**3*exp(e/(c**2 + 2*c*d*x + d**2*x**2)), x)
```

3.410 $\int e^{\frac{e}{(c+dx)^2}}(a+bx)^2\,dx$

Optimal. Leaf size=215

$$-\frac{\sqrt{\pi}\sqrt{e}\,(bc-ad)^2\text{erfi}\left(\frac{\sqrt{e}}{c+dx}\right)}{d^3}+\frac{be(bc-ad)\text{Ei}\left(\frac{e}{(c+dx)^2}\right)}{d^3}-\frac{b(c+dx)^2(bc-ad)e^{\frac{e}{(c+dx)^2}}}{d^3}+\frac{(c+dx)(bc-ad)^2e^{\frac{e}{(c+dx)^2}}}{d^3}-\frac{2\cdots}{}$$

```
[Out] (-a*d+b*c)^2*exp(e/(d*x+c)^2)*(d*x+c)/d^3+2/3*b^2*e*exp(e/(d*x+c)^2)*(d*x+c
)/d^3-b*(-a*d+b*c)*exp(e/(d*x+c)^2)*(d*x+c)^2/d^3+1/3*b^2*exp(e/(d*x+c)^2)*
(d*x+c)^3/d^3+b*(-a*d+b*c)*e*Ei(e/(d*x+c)^2)/d^3-2/3*b^2*e^(3/2)*erfi(e^(1/
2)/(d*x+c))*Pi^(1/2)/d^3-(-a*d+b*c)^2*erfi(e^(1/2)/(d*x+c))*e^(1/2)*Pi^(1/2
)/d^3
```

Rubi [A] time = 0.23, antiderivative size = 215, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 6, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.316, Rules used = {2226, 2206, 2211, 2204, 2214, 2210}

$$-\frac{\sqrt{\pi}\sqrt{e}\,(bc-ad)^2\text{Erfi}\left(\frac{\sqrt{e}}{c+dx}\right)}{d^3}+\frac{be(bc-ad)\text{Ei}\left(\frac{e}{(c+dx)^2}\right)}{d^3}-\frac{b(c+dx)^2(bc-ad)e^{\frac{e}{(c+dx)^2}}}{d^3}+\frac{(c+dx)(bc-ad)^2e^{\frac{e}{(c+dx)^2}}}{d^3}-\frac{2\cdots}{}$$

Antiderivative was successfully verified.

```
[In] Int[E^(e/(c + d*x)^2)*(a + b*x)^2,x]
```

```
[Out] ((b*c - a*d)^2*E^(e/(c + d*x)^2)*(c + d*x))/d^3 + (2*b^2*e*E^(e/(c + d*x)^2
)*(c + d*x))/(3*d^3) - (b*(b*c - a*d)*E^(e/(c + d*x)^2)*(c + d*x)^2)/d^3 +
(b^2*E^(e/(c + d*x)^2)*(c + d*x)^3)/(3*d^3) - ((b*c - a*d)^2*Sqrt[e]*Sqrt[P
i]*Erfi[Sqrt[e]/(c + d*x)])/d^3 - (2*b^2*e^(3/2)*Sqrt[Pi]*Erfi[Sqrt[e]/(c +
 d*x)])/(3*d^3) + (b*(b*c - a*d)*e*ExpIntegralEi[e/(c + d*x)^2])/d^3
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2206

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[((c +
 d*x)*F^(a + b*(c + d*x)^n))/d, x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2211

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rule 2226

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int e^{\frac{e}{(c+dx)^2}}(a+bx)^2\,dx = \int\left(\frac{(-bc+ad)^2e^{\frac{e}{(c+dx)^2}}}{d^2} - \frac{2b(bc-ad)e^{\frac{e}{(c+dx)^2}}(c+dx)}{d^2} + \frac{b^2e^{\frac{e}{(c+dx)^2}}(c+dx)^2}{d^2}\right)dx$$

$$= \frac{b^2\int e^{\frac{e}{(c+dx)^2}}(c+dx)^2\,dx}{d^2} - \frac{(2b(bc-ad))\int e^{\frac{e}{(c+dx)^2}}(c+dx)\,dx}{d^2} + \frac{(bc-ad)^2\int e^{\frac{e}{(c+dx)^2}}\,dx}{d^2}$$

$$= \frac{(bc-ad)^2e^{\frac{e}{(c+dx)^2}}(c+dx)}{d^3} - \frac{b(bc-ad)e^{\frac{e}{(c+dx)^2}}(c+dx)^2}{d^3} + \frac{b^2e^{\frac{e}{(c+dx)^2}}(c+dx)^3}{3d^3} + \frac{\left(2b^2e\right)\int e}{3d}$$

$$= \frac{(bc-ad)^2e^{\frac{e}{(c+dx)^2}}(c+dx)}{d^3} + \frac{2b^2ee^{\frac{e}{(c+dx)^2}}(c+dx)}{3d^3} - \frac{b(bc-ad)e^{\frac{e}{(c+dx)^2}}(c+dx)^2}{d^3} + \frac{b^2e^{\frac{e}{(c+dx)^2}}}{3}$$

$$= \frac{(bc-ad)^2e^{\frac{e}{(c+dx)^2}}(c+dx)}{d^3} + \frac{2b^2ee^{\frac{e}{(c+dx)^2}}(c+dx)}{3d^3} - \frac{b(bc-ad)e^{\frac{e}{(c+dx)^2}}(c+dx)^2}{d^3} + \frac{b^2e^{\frac{e}{(c+dx)^2}}}{3}$$

$$= \frac{(bc-ad)^2e^{\frac{e}{(c+dx)^2}}(c+dx)}{d^3} + \frac{2b^2ee^{\frac{e}{(c+dx)^2}}(c+dx)}{3d^3} - \frac{b(bc-ad)e^{\frac{e}{(c+dx)^2}}(c+dx)^2}{d^3} + \frac{b^2e^{\frac{e}{(c+dx)^2}}}{3}$$

Mathematica [A] time = 0.21, size = 176, normalized size = 0.82

$$\frac{-\sqrt{\pi}\sqrt{e}\left(3a^2d^2-6abcd+b^2\left(3c^2+2e\right)\right)\operatorname{erfi}\left(\frac{\sqrt{e}}{c+dx}\right)+dxe^{\frac{e}{(c+dx)^2}}\left(3a^2d^2+3abd^2x+b^2\left(d^2x^2+2e\right)\right)+3be(bc-a}{3d^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(e/(c + d*x)^2)*(a + b*x)^2,x]
```

```
[Out] (c*(-3*a*b*c*d + 3*a^2*d^2 + b^2*(c^2 + 2*e))*E^(e/(c + d*x)^2))/(3*d^3) +
(d*E^(e/(c + d*x)^2)*x*(3*a^2*d^2 + 3*a*b*d^2*x + b^2*(2*e + d^2*x^2)) - Sq
rt[e]*(-6*a*b*c*d + 3*a^2*d^2 + b^2*(3*c^2 + 2*e))*Sqrt[Pi]*Erfi[Sqrt[e]/(c
 + d*x)] + 3*b*(b*c - a*d)*e*ExpIntegralEi[e/(c + d*x)^2])/(3*d^3)
```

fricas [A] time = 0.43, size = 196, normalized size = 0.91

$$\frac{3\left(b^2c-abd\right)e\operatorname{Ei}\left(\frac{e}{d^2x^2+2\,cdx+c^2}\right)+\sqrt{\pi}\left(3\,b^2c^2d-6\,abcd^2+3\,a^2d^3+2\,b^2de\right)\sqrt{-\frac{e}{d^2}}\,\operatorname{erf}\left(\frac{d\sqrt{-\frac{e}{d^2}}}{dx+c}\right)+\left(b^2d^3x^3+3\,abd\right.}{3\,d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^2)*(b*x+a)^2,x, algorithm="fricas")
```

```
[Out] 1/3*(3*(b^2*c - a*b*d)*e*Ei(e/(d^2*x^2 + 2*c*d*x + c^2)) + sqrt(pi)*(3*b^2*
c^2*d - 6*a*b*c*d^2 + 3*a^2*d^3 + 2*b^2*d*e)*sqrt(-e/d^2)*erf(d*sqrt(-e/d^2
)/(d*x + c)) + (b^2*d^3*x^3 + 3*a*b*d^3*x^2 + b^2*c^3 - 3*a*b*c^2*d + 3*a^2
*c*d^2 + 2*b^2*c*e + (3*a^2*d^3 + 2*b^2*d*e)*x)*e^(e/(d^2*x^2 + 2*c*d*x + c
^2)))/d^3
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (bx+a)^2 e^{\left(\frac{e}{(dx+c)^2}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^2)*(b*x+a)^2,x, algorithm="giac")
```

```
[Out] integrate((b*x + a)^2*e^(e/(d*x + c)^2), x)
```

maple [A] time = 0.02, size = 313, normalized size = 1.46

$$-\frac{\left(\frac{\sqrt{\pi}\, e\, \mathrm{erf}\left(\frac{\sqrt{-e}}{dx+c}\right)}{\sqrt{-e}}-(dx+c)\,\mathrm{e}^{\frac{e}{(dx+c)^2}}\right)a^2-\frac{2\left(\frac{\sqrt{\pi}\, e\, \mathrm{erf}\left(\frac{\sqrt{-e}}{dx+c}\right)}{\sqrt{-e}}-(dx+c)\mathrm{e}^{\frac{e}{(dx+c)^2}}\right)abc}{d}+\frac{\left(\frac{\sqrt{\pi}\, e\, \mathrm{erf}\left(\frac{\sqrt{-e}}{dx+c}\right)}{\sqrt{-e}}-(dx+c)\mathrm{e}^{\frac{e}{(dx+c)^2}}\right)b^2c^2}{d^2}+\frac{2\left(-\frac{e\,\mathrm{Ei}\left(1,-\frac{e}{(dx+\cdots}\right)}{2}\cdots\right.}{\cdots}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(1/(d*x+c)^2*e)*(b*x+a)^2,x)
```

```
[Out] -1/d*(a^2*(-(d*x+c)*exp(1/(d*x+c)^2*e)+e*Pi^(1/2)/(-e)^(1/2)*erf((-e)^(1/2)
/(d*x+c)))+b^2/d^2*(-1/3*(d*x+c)^3*exp(1/(d*x+c)^2*e)+2/3*e*(-(d*x+c)*exp(1
/(d*x+c)^2*e)+e*Pi^(1/2)/(-e)^(1/2)*erf((-e)^(1/2)/(d*x+c))))+b^2*c^2/d^2*(
-(d*x+c)*exp(1/(d*x+c)^2*e)+e*Pi^(1/2)/(-e)^(1/2)*erf((-e)^(1/2)/(d*x+c)))+
2*b/d*a*(-1/2*(d*x+c)^2*exp(1/(d*x+c)^2*e)-1/2*e*Ei(1,-1/(d*x+c)^2*e))-2*b^
2/d^2*c*(-1/2*(d*x+c)^2*exp(1/(d*x+c)^2*e)-1/2*e*Ei(1,-1/(d*x+c)^2*e))-2*b*
c/d*a*(-(d*x+c)*exp(1/(d*x+c)^2*e)+e*Pi^(1/2)/(-e)^(1/2)*erf((-e)^(1/2)/(d*
x+c))))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\left(b^2d^2x^3+3\,abd^2x^2+\left(3\,a^2d^2+2\,b^2e\right)x\right)e^{\left(\frac{e}{d^2x^2+2\,cdx+c^2}\right)}}{3\,d^2}+\int -\frac{2\left(b^2c^3e+3\left(b^2cd^2e-abd^3e\right)x^2-\left(3\,a^2d^3e-\left(3\,c^2de-\cdots\right.\right.\right.}{3\left(d^5x^3+3\,cd^4x^2+3\,c^2d^3x+c^3\cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^2)*(b*x+a)^2,x, algorithm="maxima")
```

```
[Out] 1/3*(b^2*d^2*x^3 + 3*a*b*d^2*x^2 + (3*a^2*d^2 + 2*b^2*e)*x)*e^(e/(d^2*x^2 +
 2*c*d*x + c^2))/d^2 + integrate(-2/3*(b^2*c^3*e + 3*(b^2*c*d^2*e - a*b*d^3
*e)*x^2 - (3*a^2*d^3*e - (3*c^2*d*e - 2*d*e^2)*b^2)*x)*e^(e/(d^2*x^2 + 2*c*
d*x + c^2))/(d^5*x^3 + 3*c*d^4*x^2 + 3*c^2*d^3*x + c^3*d^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \mathrm{e}^{\frac{e}{(c+d\,x)^2}}\,(a+b\,x)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(c + d*x)^2)*(a + b*x)^2,x)
```

```
[Out] int(exp(e/(c + d*x)^2)*(a + b*x)^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (a+bx)^2\, e^{\frac{e}{c^2+2cdx+d^2x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)**2)*(b*x+a)**2,x)
```

```
[Out] Integral((a + b*x)**2*exp(e/(c**2 + 2*c*d*x + d**2*x**2)), x)
```

3.411 $\int e^{\frac{e}{(c+dx)^2}}(a+bx)\,dx$

Optimal. Leaf size=111

$$\frac{\sqrt{\pi}\sqrt{e}\,(bc-ad)\text{erfi}\left(\frac{\sqrt{e}}{c+dx}\right)}{d^2}-\frac{(c+dx)(bc-ad)e^{\frac{e}{(c+dx)^2}}}{d^2}-\frac{be\text{Ei}\left(\frac{e}{(c+dx)^2}\right)}{2d^2}+\frac{b(c+dx)^2e^{\frac{e}{(c+dx)^2}}}{2d^2}$$

```
[Out] -(-a*d+b*c)*exp(e/(d*x+c)^2)*(d*x+c)/d^2+1/2*b*exp(e/(d*x+c)^2)*(d*x+c)^2/d
^2-1/2*b*e*Ei(e/(d*x+c)^2)/d^2+(-a*d+b*c)*erfi(e^(1/2)/(d*x+c))*e^(1/2)*Pi^
(1/2)/d^2
```

Rubi [A] time = 0.13, antiderivative size = 111, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.353, Rules used = {2226, 2206, 2211, 2204, 2214, 2210}

$$\frac{\sqrt{\pi}\sqrt{e}\,(bc-ad)\text{Erfi}\left(\frac{\sqrt{e}}{c+dx}\right)}{d^2}-\frac{(c+dx)(bc-ad)e^{\frac{e}{(c+dx)^2}}}{d^2}-\frac{be\text{Ei}\left(\frac{e}{(c+dx)^2}\right)}{2d^2}+\frac{b(c+dx)^2e^{\frac{e}{(c+dx)^2}}}{2d^2}$$

Antiderivative was successfully verified.

```
[In] Int[E^(e/(c + d*x)^2)*(a + b*x),x]
```

```
[Out] -(((b*c - a*d)*E^(e/(c + d*x)^2)*(c + d*x))/d^2) + (b*E^(e/(c + d*x)^2)*(c
+ d*x)^2)/(2*d^2) + ((b*c - a*d)*Sqrt[e]*Sqrt[Pi]*Erfi[Sqrt[e]/(c + d*x)])/
d^2 - (b*e*ExpIntegralEi[e/(c + d*x)^2])/(2*d^2)
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2206

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[((c +
 d*x)*F^(a + b*(c + d*x)^n))/d, x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
```

```
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2211

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rule 2226

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int e^{\frac{e}{(c+dx)^2}}(a+bx)\,dx = \int \left(\frac{(-bc+ad)e^{\frac{e}{(c+dx)^2}}}{d} + \frac{be^{\frac{e}{(c+dx)^2}}(c+dx)}{d}\right)dx$$

$$= \frac{b\int e^{\frac{e}{(c+dx)^2}}(c+dx)\,dx}{d} + \frac{(-bc+ad)\int e^{\frac{e}{(c+dx)^2}}\,dx}{d}$$

$$= -\frac{(bc-ad)e^{\frac{e}{(c+dx)^2}}(c+dx)}{d^2} + \frac{be^{\frac{e}{(c+dx)^2}}(c+dx)^2}{2d^2} + \frac{(be)\int \frac{e^{\frac{e}{(c+dx)^2}}}{c+dx}\,dx}{d} + \frac{(2(-bc+ad)e)\int \frac{e^{\frac{e}{(c+\cdots}}}{(c+\cdots}}{d}$$

$$= -\frac{(bc-ad)e^{\frac{e}{(c+dx)^2}}(c+dx)}{d^2} + \frac{be^{\frac{e}{(c+dx)^2}}(c+dx)^2}{2d^2} - \frac{be\mathrm{Ei}\left(\frac{e}{(c+dx)^2}\right)}{2d^2} + \frac{(2(bc-ad)e)\,\mathrm{Subst}\left(\int e\cdots\right.}{d^2}$$

$$= -\frac{(bc-ad)e^{\frac{e}{(c+dx)^2}}(c+dx)}{d^2} + \frac{be^{\frac{e}{(c+dx)^2}}(c+dx)^2}{2d^2} + \frac{(bc-ad)\sqrt{e}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\sqrt{e}}{c+dx}\right)}{d^2} - \frac{be\mathrm{Ei}\left(\frac{e}{(c+d\cdots}\right.}{2d^2}$$

Mathematica [A] time = 0.13, size = 85, normalized size = 0.77

$$-\frac{2\sqrt{\pi}\sqrt{e}(ad-bc)\text{erfi}\left(\frac{\sqrt{e}}{c+dx}\right)+(c+dx)e^{\frac{e}{(c+dx)^2}}(-2ad+bc-bdx)+be\text{Ei}\left(\frac{e}{(c+dx)^2}\right)}{2d^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(e/(c + d*x)^2)*(a + b*x),x]
```

```
[Out] -1/2*(E^(e/(c + d*x)^2)*(c + d*x)*(b*c - 2*a*d - b*d*x) + 2*(-(b*c) + a*d)*
Sqrt[e]*Sqrt[Pi]*Erfi[Sqrt[e]/(c + d*x)] + b*e*ExpIntegralEi[e/(c + d*x)^2]
)/d^2
```

fricas [A] time = 0.42, size = 122, normalized size = 1.10

$$-\frac{be\text{Ei}\left(\frac{e}{d^2x^2+2\,cdx+c^2}\right)+2\,\sqrt{\pi}\left(bcd-ad^2\right)\sqrt{-\frac{e}{d^2}}\,\text{erf}\left(\frac{d\sqrt{-\frac{e}{d^2}}}{dx+c}\right)-\left(bd^2x^2+2\,ad^2x-bc^2+2\,acd\right)e^{\left(\frac{e}{d^2x^2+2\,cdx+c^2}\right)}}{2\,d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^2)*(b*x+a),x, algorithm="fricas")
```

```
[Out] -1/2*(b*e*Ei(e/(d^2*x^2 + 2*c*d*x + c^2)) + 2*sqrt(pi)*(b*c*d - a*d^2)*sqrt
(-e/d^2)*erf(d*sqrt(-e/d^2)/(d*x + c)) - (b*d^2*x^2 + 2*a*d^2*x - b*c^2 + 2
*a*c*d)*e^(e/(d^2*x^2 + 2*c*d*x + c^2)))/d^2
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (bx+a)e^{\left(\frac{e}{(dx+c)^2}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^2)*(b*x+a),x, algorithm="giac")
```

```
[Out] integrate((b*x + a)*e^(e/(d*x + c)^2), x)
```

maple [A] time = 0.02, size = 140, normalized size = 1.26

$$-\frac{\left(\frac{\sqrt{\pi}\,e\,\text{erf}\left(\frac{\sqrt{-e}}{dx+c}\right)}{\sqrt{-e}}-(dx+c)\,\text{e}^{\frac{e}{(dx+c)^2}}\right)a-\frac{\left(\frac{\sqrt{\pi}\,e\,\text{erf}\left(\frac{\sqrt{-e}}{dx+c}\right)}{\sqrt{-e}}-(dx+c)\text{e}^{\frac{e}{(dx+c)^2}}\right)bc}{d}+\frac{\left(-\frac{e\,\text{Ei}\left(1,-\frac{e}{(dx+c)^2}\right)}{2}-\frac{(dx+c)^2\text{e}^{\frac{e}{(dx+c)^2}}}{2}\right)b}{d}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(1/(d*x+c)^2*e)*(b*x+a),x)
```

```
[Out] -1/d*(a*(-(d*x+c)*exp(1/(d*x+c)^2*e)+e*Pi^(1/2)/(-e)^(1/2)*erf((-e)^(1/2)/(
d*x+c)))+b/d*(-1/2*(d*x+c)^2*exp(1/(d*x+c)^2*e)-1/2*e*Ei(1,-1/(d*x+c)^2*e))
-b*c/d*(-(d*x+c)*exp(1/(d*x+c)^2*e)+e*Pi^(1/2)/(-e)^(1/2)*erf((-e)^(1/2)/(d
*x+c))))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2}\left(bx^2+2\,ax\right)e^{\left(\frac{e}{d^2x^2+2\,cdx+c^2}\right)}+\int\frac{\left(bdex^2+2\,adex\right)e^{\left(\frac{e}{d^2x^2+2\,cdx+c^2}\right)}}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^2)*(b*x+a),x, algorithm="maxima")
```

```
[Out] 1/2*(b*x^2 + 2*a*x)*e^(e/(d^2*x^2 + 2*c*d*x + c^2)) + integrate((b*d*e*x^2
+ 2*a*d*e*x)*e^(e/(d^2*x^2 + 2*c*d*x + c^2))/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2
*d*x + c^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \mathrm{e}^{\frac{e}{{(c+d\,x)}^2}}\,\left(a+b\,x\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(c + d*x)^2)*(a + b*x),x)
```

```
[Out] int(exp(e/(c + d*x)^2)*(a + b*x), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(a+bx\right)e^{\frac{e}{c^2+2cdx+d^2x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)**2)*(b*x+a),x)
```

```
[Out] Integral((a + b*x)*exp(e/(c**2 + 2*c*d*x + d**2*x**2)), x)
```

3.412 $\int e^{\frac{e}{(c+dx)^2}}\,dx$

Optimal. Leaf size=50

$$\frac{(c+dx)e^{\frac{e}{(c+dx)^2}}}{d}-\frac{\sqrt{\pi}\,\sqrt{e}\,\mathrm{erfi}\left(\frac{\sqrt{e}}{c+dx}\right)}{d}$$

```
[Out] exp(e/(d*x+c)^2)*(d*x+c)/d-erfi(e^(1/2)/(d*x+c))*e^(1/2)*Pi^(1/2)/d
```

Rubi [A] time = 0.04, antiderivative size = 50, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {2206, 2211, 2204}

$$\frac{(c+dx)e^{\frac{e}{(c+dx)^2}}}{d}-\frac{\sqrt{\pi}\,\sqrt{e}\,\mathrm{Erfi}\left(\frac{\sqrt{e}}{c+dx}\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Int[E^(e/(c + d*x)^2),x]
```

```
[Out] (E^(e/(c + d*x)^2)*(c + d*x))/d - (Sqrt[e]*Sqrt[Pi]*Erfi[Sqrt[e]/(c + d*x)]
)/d
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2206

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> Simp[((c +
 d*x)*F^(a + b*(c + d*x)^n))/d, x] - Dist[b*n*Log[F], Int[(c + d*x)^n*F^(a
+ b*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[2/n] && I
LtQ[n, 0]
```

Rule 2211

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Dist[1/(d*(m + 1)), Subst[Int[F^(a + b*x^2), x], x, (c + d
*x)^(m + 1)], x] /; FreeQ[{F, a, b, c, d, m, n}, x] && EqQ[n, 2*(m + 1)]
```

Rubi steps

$$\int e^{\frac{e}{(c+dx)^2}}\,dx = \frac{e^{\frac{e}{(c+dx)^2}}(c+dx)}{d} + (2e)\int \frac{e^{\frac{e}{(c+dx)^2}}}{(c+dx)^2}\,dx$$
$$= \frac{e^{\frac{e}{(c+dx)^2}}(c+dx)}{d} - \frac{(2e)\,\text{Subst}\left(\int e^{ex^2}\,dx, x, \frac{1}{c+dx}\right)}{d}$$
$$= \frac{e^{\frac{e}{(c+dx)^2}}(c+dx)}{d} - \frac{\sqrt{e}\,\sqrt{\pi}\,\text{erfi}\left(\frac{\sqrt{e}}{c+dx}\right)}{d}$$

Mathematica [A] time = 0.02, size = 50, normalized size = 1.00

$$\frac{(c+dx)e^{\frac{e}{(c+dx)^2}}}{d} - \frac{\sqrt{\pi}\,\sqrt{e}\,\text{erfi}\left(\frac{\sqrt{e}}{c+dx}\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(e/(c + d*x)^2),x]
[Out] (E^(e/(c + d*x)^2)*(c + d*x))/d - (Sqrt[e]*Sqrt[Pi]*Erfi[Sqrt[e]/(c + d*x)]
)/d
```

fricas [A] time = 0.41, size = 63, normalized size = 1.26

$$\frac{\sqrt{\pi}\,d\sqrt{-\frac{e}{d^2}}\;\text{erf}\left(\frac{d\sqrt{-\frac{e}{d^2}}}{dx+c}\right) + (dx+c)e^{\left(\frac{e}{d^2x^2+2\,cdx+c^2}\right)}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^2),x, algorithm="fricas")
[Out] (sqrt(pi)*d*sqrt(-e/d^2)*erf(d*sqrt(-e/d^2)/(d*x + c)) + (d*x + c)*e^(e/(d^
2*x^2 + 2*c*d*x + c^2)))/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int e^{\left(\frac{e}{(dx+c)^2}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^2),x, algorithm="giac")
```

```
[Out] integrate(e^(e/(d*x + c)^2), x)
```

maple [A] time = 0.02, size = 48, normalized size = 0.96

$$-\frac{\frac{\sqrt{\pi}\, e \operatorname{erf}\left(\frac{\sqrt{-e}}{dx+c}\right)}{\sqrt{-e}} - (dx+c)\, \mathrm{e}^{\frac{e}{(dx+c)^2}}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(1/(d*x+c)^2*e),x)
```

```
[Out] -1/d*(-(d*x+c)*exp(1/(d*x+c)^2*e)+e*Pi^(1/2)/(-e)^(1/2)*erf((-e)^(1/2)/(d*x
+c)))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$2\, de \int \frac{xe^{\left(\frac{e}{d^2x^2+2\, cdx+c^2}\right)}}{d^3x^3 + 3\, cd^2x^2 + 3\, c^2dx + c^3}\, dx + xe^{\left(\frac{e}{d^2x^2+2\, cdx+c^2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^2),x, algorithm="maxima")
```

```
[Out] 2*d*e*integrate(x*e^(e/(d^2*x^2 + 2*c*d*x + c^2))/(d^3*x^3 + 3*c*d^2*x^2 +
3*c^2*d*x + c^3), x) + x*e^(e/(d^2*x^2 + 2*c*d*x + c^2))
```

mupad [B] time = 3.69, size = 43, normalized size = 0.86

$$\frac{\mathrm{e}^{\frac{e}{(c+d\,x)^2}}\,(c+d\,x)}{d} - \frac{\sqrt{e}\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{\sqrt{e}}{c+d\,x}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(c + d*x)^2),x)
```

```
[Out] (exp(e/(c + d*x)^2)*(c + d*x))/d - (e^(1/2)*pi^(1/2)*erfi(e^(1/2)/(c + d*x)
))/d
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int e^{\frac{e}{(c+dx)^2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)**2),x)
```

```
[Out] Integral(exp(e/(c + d*x)**2), x)
```

3.413 $\int \frac{e^{\frac{e}{(c+dx)^2}}}{a+bx}\,dx$

Optimal. Leaf size=22

$$\text{Int}\left(\frac{e^{\frac{e}{(c+dx)^2}}}{a+bx},x\right)$$

```
[Out] Unintegrable(exp(e/(d*x+c)^2)/(b*x+a),x)
```

Rubi [A] time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{e^{\frac{e}{(c+dx)^2}}}{a+bx}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[E^(e/(c + d*x)^2)/(a + b*x),x]
```

```
[Out] Defer[Int][E^(e/(c + d*x)^2)/(a + b*x), x]
```

Rubi steps

$$\int \frac{e^{\frac{e}{(c+dx)^2}}}{a+bx}\,dx = \int \frac{e^{\frac{e}{(c+dx)^2}}}{a+bx}\,dx$$

Mathematica [A] time = 0.04, size = 0, normalized size = 0.00

$$\int \frac{e^{\frac{e}{(c+dx)^2}}}{a+bx}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[E^(e/(c + d*x)^2)/(a + b*x),x]
```

```
[Out] Integrate[E^(e/(c + d*x)^2)/(a + b*x), x]
```

fricas [A] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{e^{\left(\frac{e}{d^2x^2+2\,cdx+c^2}\right)}}{bx+a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^2)/(b*x+a),x, algorithm="fricas")
```

```
[Out] integral(e^(e/(d^2*x^2 + 2*c*d*x + c^2))/(b*x + a), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{\left(\frac{e}{(dx+c)^2}\right)}}{bx+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^2)/(b*x+a),x, algorithm="giac")
```

```
[Out] integrate(e^(e/(d*x + c)^2)/(b*x + a), x)
```

maple [A] time = 0.12, size = 0, normalized size = 0.00

$$\int \frac{\mathrm{e}^{\frac{e}{(dx+c)^2}}}{bx+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(1/(d*x+c)^2*e)/(b*x+a),x)
```

```
[Out] int(exp(1/(d*x+c)^2*e)/(b*x+a),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{\left(\frac{e}{(dx+c)^2}\right)}}{bx+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^2)/(b*x+a),x, algorithm="maxima")
```

```
[Out] integrate(e^(e/(d*x + c)^2)/(b*x + a), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.05

$$\int \frac{\mathrm{e}^{\frac{e}{(c+d\,x)^2}}}{a+b\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(c + d*x)^2)/(a + b*x),x)
```

```
[Out] int(exp(e/(c + d*x)^2)/(a + b*x), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{\frac{e}{c^2+2cdx+d^2x^2}}}{a+bx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)**2)/(b*x+a),x)
```

```
[Out] Integral(exp(e/(c**2 + 2*c*d*x + d**2*x**2))/(a + b*x), x)
```

3.414 $\int \frac{e^{\frac{e}{(c+dx)^2}}}{(a+bx)^2}\,dx$

Optimal. Leaf size=22

$$\text{Int}\left(\frac{e^{\frac{e}{(c+dx)^2}}}{(a+bx)^2},x\right)$$

[Out] CannotIntegrate(exp(e/(d*x+c)^2)/(b*x+a)^2,x)

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{e^{\frac{e}{(c+dx)^2}}}{(a+bx)^2}\,dx$$

Verification is Not applicable to the result.

[In] Int[E^(e/(c + d*x)^2)/(a + b*x)^2,x]

[Out] Defer[Int][E^(e/(c + d*x)^2)/(a + b*x)^2, x]

Rubi steps

$$\int \frac{e^{\frac{e}{(c+dx)^2}}}{(a+bx)^2}\,dx = \int \frac{e^{\frac{e}{(c+dx)^2}}}{(a+bx)^2}\,dx$$

Mathematica [A] time = 0.33, size = 0, normalized size = 0.00

$$\int \frac{e^{\frac{e}{(c+dx)^2}}}{(a+bx)^2}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[E^(e/(c + d*x)^2)/(a + b*x)^2,x]

[Out] Integrate[E^(e/(c + d*x)^2)/(a + b*x)^2, x]

fricas [A] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{e^{\left(\frac{e}{d^2x^2+2\,cdx+c^2}\right)}}{b^2x^2+2\,abx+a^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^2)/(b*x+a)^2,x, algorithm="fricas")
[Out] integral(e^(e/(d^2*x^2 + 2*c*d*x + c^2))/(b^2*x^2 + 2*a*b*x + a^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$undef$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^2)/(b*x+a)^2,x, algorithm="giac")
[Out] undef
```

maple [A] time = 0.14, size = 0, normalized size = 0.00

$$\int \frac{\mathrm{e}^{\frac{e}{(dx+c)^2}}}{(bx+a)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(1/(d*x+c)^2*e)/(b*x+a)^2,x)
[Out] int(exp(1/(d*x+c)^2*e)/(b*x+a)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{\left(\frac{e}{(dx+c)^2}\right)}}{(bx+a)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^2)/(b*x+a)^2,x, algorithm="maxima")
[Out] integrate(e^(e/(d*x + c)^2)/(b*x + a)^2, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.05

$$\int \frac{\mathrm{e}^{\frac{e}{(c+d\,x)^2}}}{(a+b\,x)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(c + d*x)^2)/(a + b*x)^2,x)
```

```
[Out] int(exp(e/(c + d*x)^2)/(a + b*x)^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{\frac{e}{c^2+2cdx+d^2x^2}}}{(a+bx)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)**2)/(b*x+a)**2,x)
```

```
[Out] Integral(exp(e/(c**2 + 2*c*d*x + d**2*x**2))/(a + b*x)**2, x)
```

3.415 $\int \frac{e^{\frac{e}{(c+dx)^2}}}{(a+bx)^3}\,dx$

Optimal. Leaf size=22

$$\operatorname{Int}\left(\frac{e^{\frac{e}{(c+dx)^2}}}{(a+bx)^3},x\right)$$

```
[Out] CannotIntegrate(exp(e/(d*x+c)^2)/(b*x+a)^3,x)
```

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{e^{\frac{e}{(c+dx)^2}}}{(a+bx)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[E^(e/(c + d*x)^2)/(a + b*x)^3,x]
```

```
[Out] Defer[Int][E^(e/(c + d*x)^2)/(a + b*x)^3, x]
```

Rubi steps

$$\int \frac{e^{\frac{e}{(c+dx)^2}}}{(a+bx)^3}\,dx=\int \frac{e^{\frac{e}{(c+dx)^2}}}{(a+bx)^3}\,dx$$

Mathematica [A] time = 0.09, size = 0, normalized size = 0.00

$$\int \frac{e^{\frac{e}{(c+dx)^2}}}{(a+bx)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[E^(e/(c + d*x)^2)/(a + b*x)^3,x]
```

```
[Out] Integrate[E^(e/(c + d*x)^2)/(a + b*x)^3, x]
```

fricas [A] time = 0.44, size = 0, normalized size = 0.00

$$\operatorname{integral}\left(\frac{e^{\left(\frac{e}{d^2x^2+2\,cdx+c^2}\right)}}{b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^2)/(b*x+a)^3,x, algorithm="fricas")
```

```
[Out] integral(e^(e/(d^2*x^2 + 2*c*d*x + c^2))/(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x
 + a^3), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{\left(\frac{e}{(dx+c)^2}\right)}}{(bx+a)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^2)/(b*x+a)^3,x, algorithm="giac")
```

```
[Out] integrate(e^(e/(d*x + c)^2)/(b*x + a)^3, x)
```

maple [A] time = 0.20, size = 0, normalized size = 0.00

$$\int \frac{\mathrm{e}^{\frac{e}{(dx+c)^2}}}{(bx+a)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(1/(d*x+c)^2*e)/(b*x+a)^3,x)
```

```
[Out] int(exp(1/(d*x+c)^2*e)/(b*x+a)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{\left(\frac{e}{(dx+c)^2}\right)}}{(bx+a)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^2)/(b*x+a)^3,x, algorithm="maxima")
```

```
[Out] integrate(e^(e/(d*x + c)^2)/(b*x + a)^3, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.05

$$\int \frac{\mathrm{e}^{\frac{e}{(c+d\,x)^2}}}{(a+b\,x)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(c + d*x)^2)/(a + b*x)^3,x)
```

```
[Out] int(exp(e/(c + d*x)^2)/(a + b*x)^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)**2)/(b*x+a)**3,x)
```

```
[Out] Timed out
```

3.416 $\int e^{\frac{e}{(c+dx)^3}}(a+bx)^3\,dx$

Optimal. Leaf size=206

$$\frac{b^2e(bc-ad)\text{Ei}\left(\frac{e}{(c+dx)^3}\right)}{d^4}-\frac{b^2(c+dx)^3(bc-ad)e^{\frac{e}{(c+dx)^3}}}{d^4}+\frac{b(c+dx)^2(bc-ad)^2\left(-\frac{e}{(c+dx)^3}\right)^{2/3}\Gamma\left(-\frac{2}{3},-\frac{e}{(c+dx)^3}\right)}{d^4}-\frac{(c+dx)}{}$$

```
[Out] -b^2*(-a*d+b*c)*exp(e/(d*x+c)^3)*(d*x+c)^3/d^4+b^2*(-a*d+b*c)*e*Ei(e/(d*x+c
)^3)/d^4+1/3*b^3*(-e/(d*x+c)^3)^(4/3)*(d*x+c)^4*GAMMA(-4/3,-e/(d*x+c)^3)/d^
4+b*(-a*d+b*c)^2*(-e/(d*x+c)^3)^(2/3)*(d*x+c)^2*GAMMA(-2/3,-e/(d*x+c)^3)/d^
4-1/3*(-a*d+b*c)^3*(-e/(d*x+c)^3)^(1/3)*(d*x+c)*GAMMA(-1/3,-e/(d*x+c)^3)/d^
4
```

Rubi [A] time = 0.19, antiderivative size = 206, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.263, Rules used = {2226, 2208, 2218, 2214, 2210}

$$\frac{b(c+dx)^2(bc-ad)^2\left(-\frac{e}{(c+dx)^3}\right)^{2/3}\text{Gamma}\left(-\frac{2}{3},-\frac{e}{(c+dx)^3}\right)}{d^4}-\frac{(c+dx)(bc-ad)^3\sqrt[3]{-\frac{e}{(c+dx)^3}}\text{Gamma}\left(-\frac{1}{3},-\frac{e}{(c+dx)^3}\right)}{3d^4}+$$

Antiderivative was successfully verified.

```
[In] Int[E^(e/(c + d*x)^3)*(a + b*x)^3,x]
```

```
[Out] -((b^2*(b*c - a*d)*E^(e/(c + d*x)^3)*(c + d*x)^3)/d^4) + (b^2*(b*c - a*d)*e
*ExpIntegralEi[e/(c + d*x)^3])/d^4 + (b^3*(-(e/(c + d*x)^3))^(4/3)*(c + d*x
)^4*Gamma[-4/3, -(e/(c + d*x)^3)])/(3*d^4) + (b*(b*c - a*d)^2*(-(e/(c + d*x
)^3))^(2/3)*(c + d*x)^2*Gamma[-2/3, -(e/(c + d*x)^3)])/d^4 - ((b*c - a*d)^3
*(-(e/(c + d*x)^3))^(1/3)*(c + d*x)*Gamma[-1/3, -(e/(c + d*x)^3)])/(3*d^4)
```

Rule 2208

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> -Simp[(F^a
*(c + d*x)*Gamma[1/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x)^n*Log[F
]))^(1/n)), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2226

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int e^{\frac{e}{(c+dx)^3}}(a+bx)^3\,dx = \int\left(\frac{(-bc+ad)^3 e^{\frac{e}{(c+dx)^3}}}{d^3}+\frac{3b(bc-ad)^2 e^{\frac{e}{(c+dx)^3}}(c+dx)}{d^3}-\frac{3b^2(bc-ad)e^{\frac{e}{(c+dx)^3}}(c+dx)^2}{d^3}+\right.$$

$$=\frac{b^3\int e^{\frac{e}{(c+dx)^3}}(c+dx)^3\,dx}{d^3}-\frac{\left(3b^2(bc-ad)\right)\int e^{\frac{e}{(c+dx)^3}}(c+dx)^2\,dx}{d^3}+\frac{\left(3b(bc-ad)^2\right)\int e^{\frac{e}{(c+dx)^3}}}{d^3}$$

$$=-\frac{b^2(bc-ad)e^{\frac{e}{(c+dx)^3}}(c+dx)^3}{d^4}+\frac{b^3\left(-\frac{e}{(c+dx)^3}\right)^{4/3}(c+dx)^4\Gamma\left(-\frac{4}{3},-\frac{e}{(c+dx)^3}\right)}{3d^4}+\frac{b(bc-ad)^2}{}$$

$$=-\frac{b^2(bc-ad)e^{\frac{e}{(c+dx)^3}}(c+dx)^3}{d^4}+\frac{b^2(bc-ad)e\operatorname{Ei}\left(\frac{e}{(c+dx)^3}\right)}{d^4}+\frac{b^3\left(-\frac{e}{(c+dx)^3}\right)^{4/3}(c+dx)^4\Gamma\left(-\right.}{3d^4}$$

Mathematica [A] time = 0.19, size = 195, normalized size = 0.95

$$\frac{3b^2e(bc-ad)\operatorname{Ei}\left(\frac{e}{(c+dx)^3}\right)-3b^2(c+dx)^3(bc-ad)e^{\frac{e}{(c+dx)^3}}+3b(c+dx)^2(bc-ad)^2\left(-\frac{e}{(c+dx)^3}\right)^{2/3}\Gamma\left(-\frac{2}{3},-\frac{e}{(c+dx)^3}\right)-(}{3d^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(e/(c + d*x)^3)*(a + b*x)^3,x]
```

```
[Out] (-3*b^2*(b*c - a*d)*E^(e/(c + d*x)^3)*(c + d*x)^3 + 3*b^2*(b*c - a*d)*e*Exp
IntegralEi[e/(c + d*x)^3] + b^3*(-(e/(c + d*x)^3))^(4/3)*(c + d*x)^4*Gamma[
-4/3, -(e/(c + d*x)^3)] + 3*b*(b*c - a*d)^2*(-(e/(c + d*x)^3))^(2/3)*(c + d
*x)^2*Gamma[-2/3, -(e/(c + d*x)^3)] - (b*c - a*d)^3*(-(e/(c + d*x)^3))^(1/3
)*(c + d*x)*Gamma[-1/3, -(e/(c + d*x)^3)])/(3*d^4)
```

fricas [A] time = 0.49, size = 349, normalized size = 1.69

$$\frac{4\left(b^3c-ab^2d\right)e\mathrm{Ei}\left(\frac{e}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right)-6\left(b^3c^2d^2-2\,ab^2cd^3+a^2bd^4\right)\left(-\frac{e}{d^3}\right)^{\frac{2}{3}}\Gamma\left(\frac{1}{3},-\frac{e}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right)+\left(4\,b\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^3)*(b*x+a)^3,x, algorithm="fricas")
```

```
[Out] 1/4*(4*(b^3*c - a*b^2*d)*e*Ei(e/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))
- 6*(b^3*c^2*d^2 - 2*a*b^2*c*d^3 + a^2*b*d^4)*(-e/d^3)^(2/3)*gamma(1/3, -e/
(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3)) + (4*b^3*c^3*d - 12*a*b^2*c^2*d^
2 + 12*a^2*b*c*d^3 - 4*a^3*d^4 - 3*b^3*d*e)*(-e/d^3)^(1/3)*gamma(2/3, -e/(d
^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3)) + (b^3*d^4*x^4 + 4*a*b^2*d^4*x^3 +
 6*a^2*b*d^4*x^2 - b^3*c^4 + 4*a*b^2*c^3*d - 6*a^2*b*c^2*d^2 + 4*a^3*c*d^3
+ 3*b^3*c*e + (4*a^3*d^4 + 3*b^3*d*e)*x)*e^(e/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^
2*d*x + c^3)))/d^4
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (bx+a)^3 e^{\left(\frac{e}{(dx+c)^3}\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^3)*(b*x+a)^3,x, algorithm="giac")
```

```
[Out] integrate((b*x + a)^3*e^(e/(d*x + c)^3), x)
```

maple [F] time = 0.13, size = 0, normalized size = 0.00

$$\int (bx+a)^3\, \mathrm{e}^{\frac{e}{(dx+c)^3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(d*x+c)^3)*(b*x+a)^3,x)
```

```
[Out] int(exp(e/(d*x+c)^3)*(b*x+a)^3,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\left(b^3d^3x^4 + 4\,ab^2d^3x^3 + 6\,a^2bd^3x^2 + \left(4\,a^3d^3 + 3\,b^3e\right)x\right)e^{\left(\frac{e}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right)}}{4\,d^3} + \int -\frac{3\left(b^3c^4e + 4\left(b^3cd^3e - ab^2d^4e\right)x^3\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^3)*(b*x+a)^3,x, algorithm="maxima")
```

```
[Out] 1/4*(b^3*d^3*x^4 + 4*a*b^2*d^3*x^3 + 6*a^2*b*d^3*x^2 + (4*a^3*d^3 + 3*b^3*e
)*x)*e^(e/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))/d^3 + integrate(-3/4*(
b^3*c^4*e + 4*(b^3*c*d^3*e - a*b^2*d^4*e)*x^3 + 6*(b^3*c^2*d^2*e - a^2*b*d^
4*e)*x^2 - (4*a^3*d^4*e - (4*c^3*d*e - 3*d*e^2)*b^3)*x)*e^(e/(d^3*x^3 + 3*c
*d^2*x^2 + 3*c^2*d*x + c^3))/(d^7*x^4 + 4*c*d^6*x^3 + 6*c^2*d^5*x^2 + 4*c^3
*d^4*x + c^4*d^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \mathrm{e}^{\frac{e}{(c+d\,x)^3}}\,(a+b\,x)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(c + d*x)^3)*(a + b*x)^3,x)
```

```
[Out] int(exp(e/(c + d*x)^3)*(a + b*x)^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (a+bx)^3\,e^{\frac{e}{c^3+3c^2dx+3cd^2x^2+d^3x^3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)**3)*(b*x+a)**3,x)
```

```
[Out] Integral((a + b*x)**3*exp(e/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3*x**3)
), x)
```

3.417 $\int e^{\frac{e}{(c+dx)^3}}(a+bx)^2\,dx$

Optimal. Leaf size=151

$$-\frac{2b(c+dx)^2(bc-ad)\left(-\frac{e}{(c+dx)^3}\right)^{2/3}\Gamma\left(-\frac{2}{3},-\frac{e}{(c+dx)^3}\right)}{3d^3}+\frac{(c+dx)(bc-ad)^2\sqrt[3]{-\frac{e}{(c+dx)^3}}\,\Gamma\left(-\frac{1}{3},-\frac{e}{(c+dx)^3}\right)}{3d^3}-\frac{b^2e\mathrm{Ei}\left(\frac{e}{(c+dx)^3}\right)}{3d^3}$$

```
[Out] 1/3*b^2*exp(e/(d*x+c)^3)*(d*x+c)^3/d^3-1/3*b^2*e*Ei(e/(d*x+c)^3)/d^3-2/3*b*
(-a*d+b*c)*(-e/(d*x+c)^3)^(2/3)*(d*x+c)^2*GAMMA(-2/3,-e/(d*x+c)^3)/d^3+1/3*
(-a*d+b*c)^2*(-e/(d*x+c)^3)^(1/3)*(d*x+c)*GAMMA(-1/3,-e/(d*x+c)^3)/d^3
```

Rubi [A] time = 0.13, antiderivative size = 151, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.263, Rules used = {2226, 2208, 2218, 2214, 2210}

$$-\frac{2b(c+dx)^2(bc-ad)\left(-\frac{e}{(c+dx)^3}\right)^{2/3}\mathrm{Gamma}\left(-\frac{2}{3},-\frac{e}{(c+dx)^3}\right)}{3d^3}+\frac{(c+dx)(bc-ad)^2\sqrt[3]{-\frac{e}{(c+dx)^3}}\,\mathrm{Gamma}\left(-\frac{1}{3},-\frac{e}{(c+dx)^3}\right)}{3d^3}-$$

Antiderivative was successfully verified.

```
[In] Int[E^(e/(c + d*x)^3)*(a + b*x)^2,x]
```

```
[Out] (b^2*E^(e/(c + d*x)^3)*(c + d*x)^3)/(3*d^3) - (b^2*e*ExpIntegralEi[e/(c + d
*x)^3])/(3*d^3) - (2*b*(b*c - a*d)*(-(e/(c + d*x)^3))^(2/3)*(c + d*x)^2*Gam
ma[-2/3, -(e/(c + d*x)^3)])/(3*d^3) + ((b*c - a*d)^2*(-(e/(c + d*x)^3))^(1/
3)*(c + d*x)*Gamma[-1/3, -(e/(c + d*x)^3)])/(3*d^3)
```

Rule 2208

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> -Simp[(F^a
*(c + d*x)*Gamma[1/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x)^n*Log[F
]))^(1/n)), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
```

```
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2226

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int e^{\frac{e}{(c+dx)^3}}(a+bx)^2\,dx=\int\left(\frac{(-bc+ad)^2e^{\frac{e}{(c+dx)^3}}}{d^2}-\frac{2b(bc-ad)e^{\frac{e}{(c+dx)^3}}(c+dx)}{d^2}+\frac{b^2e^{\frac{e}{(c+dx)^3}}(c+dx)^2}{d^2}\right)dx$$

$$=\frac{b^2\int e^{\frac{e}{(c+dx)^3}}(c+dx)^2\,dx}{d^2}-\frac{(2b(bc-ad))\int e^{\frac{e}{(c+dx)^3}}(c+dx)\,dx}{d^2}+\frac{(bc-ad)^2\int e^{\frac{e}{(c+dx)^3}}\,dx}{d^2}$$

$$=\frac{b^2e^{\frac{e}{(c+dx)^3}}(c+dx)^3}{3d^3}-\frac{2b(bc-ad)\left(-\frac{e}{(c+dx)^3}\right)^{2/3}(c+dx)^2\Gamma\left(-\frac{2}{3},-\frac{e}{(c+dx)^3}\right)}{3d^3}+\frac{(bc-ad)^2\sqrt[3]{-\cdots}}{\cdots}$$

$$=\frac{b^2e^{\frac{e}{(c+dx)^3}}(c+dx)^3}{3d^3}-\frac{b^2e\text{Ei}\left(\frac{e}{(c+dx)^3}\right)}{3d^3}-\frac{2b(bc-ad)\left(-\frac{e}{(c+dx)^3}\right)^{2/3}(c+dx)^2\Gamma\left(-\frac{2}{3},-\frac{e}{(c+dx)^3}\right)}{3d^3}\cdots$$

Mathematica [A] time = 0.08, size = 136, normalized size = 0.90

$$\frac{-2b(c+dx)^2(bc-ad)\left(-\frac{e}{(c+dx)^3}\right)^{2/3}\Gamma\left(-\frac{2}{3},-\frac{e}{(c+dx)^3}\right)+(c+dx)(bc-ad)^2\sqrt[3]{-\frac{e}{(c+dx)^3}}\,\Gamma\left(-\frac{1}{3},-\frac{e}{(c+dx)^3}\right)-b^2e\text{Ei}\left(\frac{e}{(c+dx)^3}\right)\cdots}{3d^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(e/(c + d*x)^3)*(a + b*x)^2,x]
```

```
[Out] (b^2*E^(e/(c + d*x)^3)*(c + d*x)^3 - b^2*e*ExpIntegralEi[e/(c + d*x)^3] - 2
*b*(b*c - a*d)*(-(e/(c + d*x)^3))^(2/3)*(c + d*x)^2*Gamma[-2/3, -(e/(c + d*
x)^3)] + (b*c - a*d)^2*(-(e/(c + d*x)^3))^(1/3)*(c + d*x)*Gamma[-1/3, -(e/(
c + d*x)^3)])/(3*d^3)
```

fricas [A] time = 0.46, size = 259, normalized size = 1.72

$$-\frac{b^2e\mathrm{Ei}\left(\frac{e}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right)-3\left(b^2cd^2-abd^3\right)\left(-\frac{e}{d^3}\right)^{\frac{2}{3}}\Gamma\left(\frac{1}{3},-\frac{e}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right)+3\left(b^2c^2d-2\,abcd^2+a^2d^3\right)\left(\right.}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^3)*(b*x+a)^2,x, algorithm="fricas")
```

```
[Out] -1/3*(b^2*e*Ei(e/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3)) - 3*(b^2*c*d^2
- a*b*d^3)*(-e/d^3)^(2/3)*gamma(1/3, -e/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x
+ c^3)) + 3*(b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*(-e/d^3)^(1/3)*gamma(2/3, -
e/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3)) - (b^2*d^3*x^3 + 3*a*b*d^3*x^2
 + 3*a^2*d^3*x + b^2*c^3 - 3*a*b*c^2*d + 3*a^2*c*d^2)*e^(e/(d^3*x^3 + 3*c*d
^2*x^2 + 3*c^2*d*x + c^3)))/d^3
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (bx+a)^2 e^{\left(\frac{e}{(dx+c)^3}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^3)*(b*x+a)^2,x, algorithm="giac")
```

```
[Out] integrate((b*x + a)^2*e^(e/(d*x + c)^3), x)
```

maple [F] time = 0.11, size = 0, normalized size = 0.00

$$\int (bx+a)^2\, \mathrm{e}^{\frac{e}{(dx+c)^3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(1/(d*x+c)^3*e)*(b*x+a)^2,x)
```

```
[Out] int(exp(1/(d*x+c)^3*e)*(b*x+a)^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{3}\left(b^2x^3+3\,abx^2+3\,a^2x\right)e^{\left(\frac{e}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right)}+\int \frac{\left(b^2dex^3+3\,abdex^2+3\,a^2dex\right)e^{\left(\frac{e}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right)}}{d^4x^4+4\,cd^3x^3+6\,c^2d^2x^2+4\,c^3dx+c^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^3)*(b*x+a)^2,x, algorithm="maxima")
```

```
[Out] 1/3*(b^2*x^3 + 3*a*b*x^2 + 3*a^2*x)*e^(e/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x
 + c^3)) + integrate((b^2*d*e*x^3 + 3*a*b*d*e*x^2 + 3*a^2*d*e*x)*e^(e/(d^3*
x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))/(d^4*x^4 + 4*c*d^3*x^3 + 6*c^2*d^2*x^
2 + 4*c^3*d*x + c^4), x)
```

mupad **[F]** time = 0.00, size = -1, normalized size = -0.01

$$\int \mathrm{e}^{\frac{e}{(c+d\,x)^3}}\,(a+b\,x)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(c + d*x)^3)*(a + b*x)^2,x)
```

```
[Out] int(exp(e/(c + d*x)^3)*(a + b*x)^2, x)
```

sympy **[F]** time = 0.00, size = 0, normalized size = 0.00

$$\int (a+bx)^2\,e^{\frac{e}{c^3+3c^2dx+3cd^2x^2+d^3x^3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)**3)*(b*x+a)**2,x)
```

```
[Out] Integral((a + b*x)**2*exp(e/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3*x**3)
), x)
```

3.418 $\int e^{\frac{e}{(c+dx)^3}}(a+bx)\,dx$

Optimal. Leaf size=92

$$\frac{b(c+dx)^2\left(-\frac{e}{(c+dx)^3}\right)^{2/3}\Gamma\left(-\frac{2}{3},-\frac{e}{(c+dx)^3}\right)}{3d^2}-\frac{(c+dx)(bc-ad)\sqrt[3]{-\frac{e}{(c+dx)^3}}\,\Gamma\left(-\frac{1}{3},-\frac{e}{(c+dx)^3}\right)}{3d^2}$$

```
[Out] 1/3*b*(-e/(d*x+c)^3)^(2/3)*(d*x+c)^2*GAMMA(-2/3,-e/(d*x+c)^3)/d^2-1/3*(-a*d
+b*c)*(-e/(d*x+c)^3)^(1/3)*(d*x+c)*GAMMA(-1/3,-e/(d*x+c)^3)/d^2
```

Rubi [A] time = 0.06, antiderivative size = 92, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.176, Rules used = {2226, 2208, 2218}

$$\frac{b(c+dx)^2\left(-\frac{e}{(c+dx)^3}\right)^{2/3}\text{Gamma}\left(-\frac{2}{3},-\frac{e}{(c+dx)^3}\right)}{3d^2}-\frac{(c+dx)(bc-ad)\sqrt[3]{-\frac{e}{(c+dx)^3}}\,\text{Gamma}\left(-\frac{1}{3},-\frac{e}{(c+dx)^3}\right)}{3d^2}$$

Antiderivative was successfully verified.

```
[In] Int[E^(e/(c + d*x)^3)*(a + b*x),x]
```

```
[Out] (b*(-(e/(c + d*x)^3))^(2/3)*(c + d*x)^2*Gamma[-2/3, -(e/(c + d*x)^3)])/(3*d
^2) - ((b*c - a*d)*(-(e/(c + d*x)^3))^(1/3)*(c + d*x)*Gamma[-1/3, -(e/(c +
d*x)^3)])/(3*d^2)
```

Rule 2208

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> -Simp[(F^a
*(c + d*x)*Gamma[1/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x)^n*Log[F
]))^(1/n)), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2226

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\begin{aligned}\int e^{\frac{e}{(c+dx)^3}}(a+bx)\,dx &= \int\left(\frac{(-bc+ad)e^{\frac{e}{(c+dx)^3}}}{d}+\frac{be^{\frac{e}{(c+dx)^3}}(c+dx)}{d}\right)dx\\ &= \frac{b\int e^{\frac{e}{(c+dx)^3}}(c+dx)\,dx}{d}+\frac{(-bc+ad)\int e^{\frac{e}{(c+dx)^3}}\,dx}{d}\\ &= \frac{b\left(-\frac{e}{(c+dx)^3}\right)^{2/3}(c+dx)^2\Gamma\left(-\frac{2}{3},-\frac{e}{(c+dx)^3}\right)}{3d^2}-\frac{(bc-ad)\sqrt[3]{-\frac{e}{(c+dx)^3}}(c+dx)\Gamma\left(-\frac{1}{3},-\frac{e}{(c+dx)^3}\right)}{3d^2}\end{aligned}$$

Mathematica [A] time = 0.09, size = 85, normalized size = 0.92

$$\frac{(c+dx)\left((ad-bc)\sqrt[3]{-\frac{e}{(c+dx)^3}}\,\Gamma\left(-\frac{1}{3},-\frac{e}{(c+dx)^3}\right)+b(c+dx)\left(-\frac{e}{(c+dx)^3}\right)^{2/3}\Gamma\left(-\frac{2}{3},-\frac{e}{(c+dx)^3}\right)\right)}{3d^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(e/(c + d*x)^3)*(a + b*x),x]
```

```
[Out] ((c + d*x)*(b*(-(e/(c + d*x)^3))^(2/3)*(c + d*x)*Gamma[-2/3, -(e/(c + d*x)^
3)] + (-(b*c) + a*d)*(-(e/(c + d*x)^3))^(1/3)*Gamma[-1/3, -(e/(c + d*x)^3)]
))/(3*d^2)
```

fricas [B] time = 0.45, size = 169, normalized size = 1.84

$$-\frac{bd^2\left(-\frac{e}{d^3}\right)^{\frac{2}{3}}\Gamma\left(\frac{1}{3},-\frac{e}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right)-2\left(bcd-ad^2\right)\left(-\frac{e}{d^3}\right)^{\frac{1}{3}}\Gamma\left(\frac{2}{3},-\frac{e}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right)-\left(bd^2x^2+2\,ad^2x-\right.}{2\,d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^3)*(b*x+a),x, algorithm="fricas")
```

```
[Out] -1/2*(b*d^2*(-e/d^3)^(2/3)*gamma(1/3, -e/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x
 + c^3)) - 2*(b*c*d - a*d^2)*(-e/d^3)^(1/3)*gamma(2/3, -e/(d^3*x^3 + 3*c*d^
2*x^2 + 3*c^2*d*x + c^3)) - (b*d^2*x^2 + 2*a*d^2*x - b*c^2 + 2*a*c*d)*e^(e/
(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3)))/d^2
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int(bx+a)e^{\left(\frac{e}{(dx+c)^3}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^3)*(b*x+a),x, algorithm="giac")
```

```
[Out] integrate((b*x + a)*e^(e/(d*x + c)^3), x)
```

maple [F] time = 0.10, size = 0, normalized size = 0.00

$$\int (bx+a)\,\mathrm{e}^{\frac{e}{(dx+c)^3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(1/(d*x+c)^3*e)*(b*x+a),x)
```

```
[Out] int(exp(1/(d*x+c)^3*e)*(b*x+a),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2}\left(bx^2+2\,ax\right)e^{\left(\frac{e}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right)}+\int\frac{3\left(bdex^2+2\,adex\right)e^{\left(\frac{e}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right)}}{2\left(d^4x^4+4\,cd^3x^3+6\,c^2d^2x^2+4\,c^3dx+c^4\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^3)*(b*x+a),x, algorithm="maxima")
```

```
[Out] 1/2*(b*x^2 + 2*a*x)*e^(e/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3)) + integ
rate(3/2*(b*d*e*x^2 + 2*a*d*e*x)*e^(e/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x +
c^3))/(d^4*x^4 + 4*c*d^3*x^3 + 6*c^2*d^2*x^2 + 4*c^3*d*x + c^4), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \mathrm{e}^{\frac{e}{{(c+d\,x)}^3}}\,\left(a+b\,x\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(c + d*x)^3)*(a + b*x),x)
```

```
[Out] int(exp(e/(c + d*x)^3)*(a + b*x), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (a+bx)\,e^{\frac{e}{c^3+3c^2dx+3cd^2x^2+d^3x^3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)**3)*(b*x+a),x)
```

```
[Out] Integral((a + b*x)*exp(e/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3*x**3)),
x)
```

3.419 $\int e^{\frac{e}{(c+dx)^3}} dx$

Optimal. Leaf size=40

$$\frac{(c+dx)\sqrt[3]{-\frac{e}{(c+dx)^3}}\,\Gamma\left(-\frac{1}{3},-\frac{e}{(c+dx)^3}\right)}{3d}$$

```
[Out] 1/3*(-e/(d*x+c)^3)^(1/3)*(d*x+c)*GAMMA(-1/3,-e/(d*x+c)^3)/d
```

Rubi [A] time = 0.01, antiderivative size = 40, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {2208}

$$\frac{(c+dx)\sqrt[3]{-\frac{e}{(c+dx)^3}}\,\text{Gamma}\left(-\frac{1}{3},-\frac{e}{(c+dx)^3}\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[E^(e/(c + d*x)^3),x]
```

```
[Out] ((-(e/(c + d*x)^3))^(1/3)*(c + d*x)*Gamma[-1/3, -(e/(c + d*x)^3)])/(3*d)
```

Rule 2208

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> -Simp[(F^a
*(c + d*x)*Gamma[1/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x)^n*Log[F
]))^(1/n)), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rubi steps

$$\int e^{\frac{e}{(c+dx)^3}}\,dx=\frac{\sqrt[3]{-\frac{e}{(c+dx)^3}}\,(c+dx)\Gamma\left(-\frac{1}{3},-\frac{e}{(c+dx)^3}\right)}{3d}$$

Mathematica [A] time = 0.01, size = 40, normalized size = 1.00

$$\frac{(c+dx)\sqrt[3]{-\frac{e}{(c+dx)^3}}\,\Gamma\left(-\frac{1}{3},-\frac{e}{(c+dx)^3}\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(e/(c + d*x)^3),x]
```

```
[Out] ((-(e/(c + d*x)^3))^(1/3)*(c + d*x)*Gamma[-1/3, -(e/(c + d*x)^3)])/(3*d)
```

fricas [B] time = 0.43, size = 89, normalized size = 2.22

$$-\frac{d\left(-\frac{e}{d^3}\right)^{\frac{1}{3}}\Gamma\left(\frac{2}{3},-\frac{e}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right)-(dx+c)e^{\left(\frac{e}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right)}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^3),x, algorithm="fricas")
[Out] -(d*(-e/d^3)^(1/3)*gamma(2/3, -e/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))
 - (d*x + c)*e^(e/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3)))/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int e^{\left(\frac{e}{(dx+c)^3}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^3),x, algorithm="giac")
[Out] integrate(e^(e/(d*x + c)^3), x)
```

maple [F] time = 0.05, size = 0, normalized size = 0.00

$$\int \mathrm{e}^{\frac{e}{(dx+c)^3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(1/(d*x+c)^3*e),x)
[Out] int(exp(1/(d*x+c)^3*e),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$3\,de\int\frac{xe^{\left(\frac{e}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right)}}{d^4x^4+4\,cd^3x^3+6\,c^2d^2x^2+4\,c^3dx+c^4}\,dx+xe^{\left(\frac{e}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^3),x, algorithm="maxima")
[Out] 3*d*e*integrate(x*e^(e/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))/(d^4*x^4
+ 4*c*d^3*x^3 + 6*c^2*d^2*x^2 + 4*c^3*d*x + c^4), x) + x*e^(e/(d^3*x^3 + 3*
c*d^2*x^2 + 3*c^2*d*x + c^3))
```

mupad [B] time = 3.95, size = 61, normalized size = 1.52

$$\frac{(c+d\,x)\left(\mathrm{e}^{\frac{e}{(c+d\,x)^3}}+\Gamma\left(\frac{2}{3}\right)\left(-\frac{e}{(c+d\,x)^3}\right)^{1/3}-\left(-\frac{e}{(c+d\,x)^3}\right)^{1/3}\Gamma\left(\frac{2}{3},-\frac{e}{(c+d\,x)^3}\right)\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(c + d*x)^3),x)
```

```
[Out] ((c + d*x)*(exp(e/(c + d*x)^3) + gamma(2/3)*(-e/(c + d*x)^3)^(1/3) - (-e/(c
 + d*x)^3)^(1/3)*igamma(2/3, -e/(c + d*x)^3)))/d
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int e^{\frac{e}{(c+dx)^3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)**3),x)
```

```
[Out] Integral(exp(e/(c + d*x)**3), x)
```

3.420 $\int \frac{e^{\frac{e}{(c+dx)^3}}}{a+bx} dx$

Optimal. Leaf size=22

$$\text{Int}\left(\frac{e^{\frac{e}{(c+dx)^3}}}{a+bx}, x\right)$$

```
[Out] Unintegrable(exp(e/(d*x+c)^3)/(b*x+a),x)
```

Rubi [A] time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{e^{\frac{e}{(c+dx)^3}}}{a+bx} dx$$

Verification is Not applicable to the result.

```
[In] Int[E^(e/(c + d*x)^3)/(a + b*x),x]
```

```
[Out] Defer[Int][E^(e/(c + d*x)^3)/(a + b*x), x]
```

Rubi steps

$$\int \frac{e^{\frac{e}{(c+dx)^3}}}{a+bx} dx = \int \frac{e^{\frac{e}{(c+dx)^3}}}{a+bx} dx$$

Mathematica [A] time = 0.03, size = 0, normalized size = 0.00

$$\int \frac{e^{\frac{e}{(c+dx)^3}}}{a+bx} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[E^(e/(c + d*x)^3)/(a + b*x),x]
```

```
[Out] Integrate[E^(e/(c + d*x)^3)/(a + b*x), x]
```

fricas [A] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{e^{\left(\frac{e}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right)}}{bx+a}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^3)/(b*x+a),x, algorithm="fricas")
[Out] integral(e^(e/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))/(b*x + a), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{\left(\frac{e}{(dx+c)^3}\right)}}{bx+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^3)/(b*x+a),x, algorithm="giac")
[Out] integrate(e^(e/(d*x + c)^3)/(b*x + a), x)
```

maple [A] time = 0.11, size = 0, normalized size = 0.00

$$\int \frac{\mathrm{e}^{\frac{e}{(dx+c)^3}}}{bx+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(1/(d*x+c)^3*e)/(b*x+a),x)
[Out] int(exp(1/(d*x+c)^3*e)/(b*x+a),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{\left(\frac{e}{(dx+c)^3}\right)}}{bx+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^3)/(b*x+a),x, algorithm="maxima")
[Out] integrate(e^(e/(d*x + c)^3)/(b*x + a), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.05

$$\int \frac{\mathrm{e}^{\frac{e}{(c+d\,x)^3}}}{a+b\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(c + d*x)^3)/(a + b*x),x)
```

```
[Out] int(exp(e/(c + d*x)^3)/(a + b*x), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{\frac{e}{c^3+3c^2dx+3cd^2x^2+d^3x^3}}}{a+bx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)**3)/(b*x+a),x)
```

```
[Out] Integral(exp(e/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3*x**3))/(a + b*x),
x)
```

3.421 $\int \frac{e^{\frac{e}{(c+dx)^3}}}{(a+bx)^2} dx$

Optimal. Leaf size=22

$$\text{Int}\left(\frac{e^{\frac{e}{(c+dx)^3}}}{(a+bx)^2}, x\right)$$

[Out] CannotIntegrate(exp(e/(d*x+c)^3)/(b*x+a)^2,x)

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{e^{\frac{e}{(c+dx)^3}}}{(a+bx)^2} dx$$

Verification is Not applicable to the result.

[In] Int[E^(e/(c + d*x)^3)/(a + b*x)^2,x]

[Out] Defer[Int][E^(e/(c + d*x)^3)/(a + b*x)^2, x]

Rubi steps

$$\int \frac{e^{\frac{e}{(c+dx)^3}}}{(a+bx)^2} dx = \int \frac{e^{\frac{e}{(c+dx)^3}}}{(a+bx)^2} dx$$

Mathematica [A] time = 0.36, size = 0, normalized size = 0.00

$$\int \frac{e^{\frac{e}{(c+dx)^3}}}{(a+bx)^2} dx$$

Verification is Not applicable to the result.

[In] Integrate[E^(e/(c + d*x)^3)/(a + b*x)^2,x]

[Out] Integrate[E^(e/(c + d*x)^3)/(a + b*x)^2, x]

fricas [A] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{e^{\left(\frac{e}{d^3x^3+3\,cd^2x^2+3\,c^2dx+c^3}\right)}}{b^2x^2+2\,abx+a^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^3)/(b*x+a)^2,x, algorithm="fricas")
```

```
[Out] integral(e^(e/(d^3*x^3 + 3*c*d^2*x^2 + 3*c^2*d*x + c^3))/(b^2*x^2 + 2*a*b*x
 + a^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$undef$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^3)/(b*x+a)^2,x, algorithm="giac")
```

```
[Out] undef
```

maple [A] time = 0.12, size = 0, normalized size = 0.00

$$\int \frac{e^{\frac{e}{(dx+c)^3}}}{(bx+a)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(1/(d*x+c)^3*e)/(b*x+a)^2,x)
```

```
[Out] int(exp(1/(d*x+c)^3*e)/(b*x+a)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{\left(\frac{e}{(dx+c)^3}\right)}}{(bx+a)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)^3)/(b*x+a)^2,x, algorithm="maxima")
```

```
[Out] integrate(e^(e/(d*x + c)^3)/(b*x + a)^2, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.05

$$\int \frac{e^{\frac{e}{(c+d\,x)^3}}}{(a+b\,x)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e/(c + d*x)^3)/(a + b*x)^2,x)
```

```
[Out] int(exp(e/(c + d*x)^3)/(a + b*x)^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e/(d*x+c)**3)/(b*x+a)**2,x)
```

```
[Out] Timed out
```

3.422 $\int \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{g+hx}\,dx$

Optimal. Leaf size=104

$$\frac{F^{\frac{f(bg-ah)}{dg-ch}+e}\text{Ei}\left(-\frac{(bc-ad)f(g+hx)\log(F)}{(dg-ch)(c+dx)}\right)}{h}-\frac{F^{\frac{bf}{d}+e}\text{Ei}\left(-\frac{(bc-ad)f\log(F)}{d(c+dx)}\right)}{h}$$

```
[Out] -F^(e+b*f/d)*Ei(-(-a*d+b*c)*f*ln(F)/d/(d*x+c))/h+F^(e+f*(-a*h+b*g)/(-c*h+d*
g))*Ei(-(-a*d+b*c)*f*(h*x+g)*ln(F)/(-c*h+d*g)/(d*x+c))/h
```

Rubi [A] time = 1.05, antiderivative size = 104, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.192, Rules used = {2231, 2230, 2210, 2233, 2178}

$$\frac{F^{\frac{f(bg-ah)}{dg-ch}+e}\text{Ei}\left(-\frac{(bc-ad)f(g+hx)\log(F)}{(dg-ch)(c+dx)}\right)}{h}-\frac{F^{\frac{bf}{d}+e}\text{Ei}\left(-\frac{(bc-ad)f\log(F)}{d(c+dx)}\right)}{h}$$

Antiderivative was successfully verified.

```
[In] Int[F^(e + (f*(a + b*x))/(c + d*x))/(g + h*x),x]
```

```
[Out] -((F^(e + (b*f)/d)*ExpIntegralEi[-(((b*c - a*d)*f*Log[F])/(d*(c + d*x)))])/
h) + (F^(e + (f*(b*g - a*h))/(d*g - c*h))*ExpIntegralEi[-(((b*c - a*d)*f*(g
 + h*x)*Log[F])/((d*g - c*h)*(c + d*x)))])/h
```

Rule 2178

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - (c*f)/d))*ExpIntegralEi[(f*g*(c + d*x)*Log[F])/d])/d, x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2230

```
Int[(F_)^((e_.) + ((f_.)*((a_.) + (b_.)*(x_)))/((c_.) + (d_.)*(x_)))*((g_.)
 + (h_.)*(x_))^(m_.), x_Symbol] :> Int[(g + h*x)^m*F^((d*e + b*f)/d - (f*(b
*c - a*d))/(d*(c + d*x))), x] /; FreeQ[{F, a, b, c, d, e, f, g, h, m}, x] &
```

```
& NeQ[b*c - a*d, 0] && EqQ[d*g - c*h, 0]
```

Rule 2231

```
Int[(F_)^((e_.) + ((f_.)*((a_.) + (b_.)*(x_)))/((c_.) + (d_.)*(x_)))/((g_.)
 + (h_.)*(x_)), x_Symbol] :> Dist[d/h, Int[F^(e + (f*(a + b*x))/(c + d*x))/
(c + d*x), x], x] - Dist[(d*g - c*h)/h, Int[F^(e + (f*(a + b*x))/(c + d*x))
/((c + d*x)*(g + h*x)), x], x] /; FreeQ[{F, a, b, c, d, e, f, g, h}, x] &&
NeQ[b*c - a*d, 0] && NeQ[d*g - c*h, 0]
```

Rule 2233

```
Int[(F_)^((e_.) + ((f_.)*((a_.) + (b_.)*(x_)))/((c_.) + (d_.)*(x_)))/(((g_.
) + (h_.)*(x_))*((i_.) + (j_.)*(x_))), x_Symbol] :> -Dist[d/(h*(d*i - c*j))
, Subst[Int[F^(e + (f*(b*i - a*j))/(d*i - c*j) - ((b*c - a*d)*f*x)/(d*i - c
*j))/x, x], x, (i + j*x)/(c + d*x)], x] /; FreeQ[{F, a, b, c, d, e, f, g, h
}, x] && EqQ[d*g - c*h, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{g+hx}\,dx &= \frac{d\int \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{c+dx}\,dx}{h} - \frac{(dg-ch)\int \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{(c+dx)(g+hx)}\,dx}{h}\\
&= \frac{\text{Subst}\left(\int \frac{F^{e+\frac{f(bg-ah)}{dg-ch}-\frac{(bc-ad)fx}{dg-ch}}}{x}\,dx, x, \frac{g+hx}{c+dx}\right)}{h} + \frac{d\int \frac{F^{\frac{de+bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}}{c+dx}\,dx}{h}\\
&= -\frac{F^{e+\frac{bf}{d}}\,\text{Ei}\left(-\frac{(bc-ad)f\log(F)}{d(c+dx)}\right)}{h} + \frac{F^{e+\frac{f(bg-ah)}{dg-ch}}\,\text{Ei}\left(-\frac{(bc-ad)f(g+hx)\log(F)}{(dg-ch)(c+dx)}\right)}{h}
\end{aligned}$$

Mathematica [A] time = 0.32, size = 103, normalized size = 0.99

$$\frac{F^{\frac{bf}{d}+e}\left(F^{\frac{fh(bc-ad)}{d(dg-ch)}}\,\text{Ei}\left(\frac{(bc-ad)f(g+hx)\log(F)}{(ch-dg)(c+dx)}\right)-\text{Ei}\left(\frac{(adf-bcf)\log(F)}{d(c+dx)}\right)\right)}{h}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(e + (f*(a + b*x))/(c + d*x))/(g + h*x),x]
```

```
[Out] (F^(e + (b*f)/d)*(-ExpIntegralEi[((-(b*c*f) + a*d*f)*Log[F])/(d*(c + d*x))]
 + F^(((b*c - a*d)*f*h)/(d*(d*g - c*h)))*ExpIntegralEi[((b*c - a*d)*f*(g +
h*x)*Log[F])/((-(d*g) + c*h)*(c + d*x))]))/h
```

fricas [A] time = 0.43, size = 135, normalized size = 1.30

$$-\frac{F^{\frac{de+bf}{d}}\operatorname{Ei}\left(-\frac{(bc-ad)f\log(F)}{d^2x+cd}\right)-F^{\frac{(de+bf)g-(ce+af)h}{dg-ch}}\operatorname{Ei}\left(-\frac{\left((bc-ad)fhx+(bc-ad)fg\right)\log(F)}{cdg-c^2h+\left(d^2g-cdh\right)x}\right)}{h}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(e+f*(b*x+a)/(d*x+c))/(h*x+g),x, algorithm="fricas")
```

```
[Out] -(F^((d*e + b*f)/d)*Ei(-(b*c - a*d)*f*log(F)/(d^2*x + c*d)) - F^(((d*e + b*
f)*g - (c*e + a*f)*h)/(d*g - c*h))*Ei(-((b*c - a*d)*f*h*x + (b*c - a*d)*f*g
)*log(F)/(c*d*g - c^2*h + (d^2*g - c*d*h)*x)))/h
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{e+\frac{(bx+a)f}{dx+c}}}{hx+g}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(e+f*(b*x+a)/(d*x+c))/(h*x+g),x, algorithm="giac")
```

```
[Out] integrate(F^(e + (b*x + a)*f/(d*x + c))/(h*x + g), x)
```

maple [B] time = 0.26, size = 432, normalized size = 4.15

$$\frac{adF^{\frac{bf+de}{d}}\operatorname{Ei}\left(1,-\frac{(ad-bc)f\ln(F)}{(dx+c)d}-\frac{(bf+de)\ln(F)}{d}-\frac{-bf\ln(F)-de\ln(F)}{d}\right)}{(ad-bc)h}-\frac{adF^{\frac{afh-bfg+ceh-deg}{ch-dg}}\operatorname{Ei}\left(1,-\frac{(ad-bc)f\ln(F)}{(dx+c)d}-\frac{(bf+de)\ln(F)}{d}\right.}{(ad-bc)h}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(e+f*(b*x+a)/(d*x+c))/(h*x+g),x)
```

```
[Out] d/h/(a*d-b*c)*F^((b*f+d*e)/d)*Ei(1,-f*(a*d-b*c)*ln(F)/d/(d*x+c)-(b*f+d*e)*l
n(F)/d-(-b*f*ln(F)-d*e*ln(F))/d)*a-1/h/(a*d-b*c)*F^((b*f+d*e)/d)*Ei(1,-f*(a
*d-b*c)*ln(F)/d/(d*x+c)-(b*f+d*e)*ln(F)/d-(-b*f*ln(F)-d*e*ln(F))/d)*b*c-d/h
/(a*d-b*c)*F^((a*f*h-b*f*g+c*e*h-d*e*g)/(c*h-d*g))*Ei(1,-f*(a*d-b*c)*ln(F)/
d/(d*x+c)-(b*f+d*e)*ln(F)/d-(-ln(F)*a*f*h+ln(F)*b*f*g-ln(F)*c*e*h+ln(F)*d*e
*g)/(c*h-d*g))*a+1/h/(a*d-b*c)*F^((a*f*h-b*f*g+c*e*h-d*e*g)/(c*h-d*g))*Ei(1
```

```
,-f*(a*d-b*c)*ln(F)/d/(d*x+c)-(b*f+d*e)*ln(F)/d-(-ln(F)*a*f*h+ln(F)*b*f*g-l
n(F)*c*e*h+ln(F)*d*e*g)/(c*h-d*g))*b*c
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{e+\frac{(bx+a)f}{dx+c}}}{hx+g}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(e+f*(b*x+a)/(d*x+c))/(h*x+g),x, algorithm="maxima")
```

```
[Out] integrate(F^(e + (b*x + a)*f/(d*x + c))/(h*x + g), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{F^{e+\frac{f\,(a+b\,x)}{c+d\,x}}}{g+h\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(e + (f*(a + b*x))/(c + d*x))/(g + h*x),x)
```

```
[Out] int(F^(e + (f*(a + b*x))/(c + d*x))/(g + h*x), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(e+f*(b*x+a)/(d*x+c))/(h*x+g),x)
```

```
[Out] Timed out
```

3.423 $\int \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{(g+hx)^2}\,dx$

Optimal. Leaf size=159

$$\frac{f\log(F)(bc-ad)F^{\frac{f(bg-ah)}{dg-ch}+e}\text{Ei}\left(-\frac{(bc-ad)f(g+hx)\log(F)}{(dg-ch)(c+dx)}\right)}{(dg-ch)^2}+\frac{dF^{-\frac{f(bc-ad)}{d(c+dx)}+\frac{bf}{d}+e}}{h(dg-ch)}-\frac{F^{\frac{f(a+bx)}{c+dx}+e}}{h(g+hx)}$$

```
[Out] d*F^(e+b*f/d-(-a*d+b*c)*f/d/(d*x+c))/h/(-c*h+d*g)-F^(e+f*(b*x+a)/(d*x+c))/h
/(h*x+g)+(-a*d+b*c)*f*F^(e+f*(-a*h+b*g)/(-c*h+d*g))*Ei(-(-a*d+b*c)*f*(h*x+g
)*ln(F)/(-c*h+d*g)/(d*x+c))*ln(F)/(-c*h+d*g)^2
```

Rubi [A] time = 2.56, antiderivative size = 159, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 8, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308, Rules used = {2232, 6742, 2230, 2209, 2210, 2231, 2233, 2178}

$$\frac{f\log(F)(bc-ad)F^{\frac{f(bg-ah)}{dg-ch}+e}\text{Ei}\left(-\frac{(bc-ad)f(g+hx)\log(F)}{(dg-ch)(c+dx)}\right)}{(dg-ch)^2}+\frac{dF^{-\frac{f(bc-ad)}{d(c+dx)}+\frac{bf}{d}+e}}{h(dg-ch)}-\frac{F^{\frac{f(a+bx)}{c+dx}+e}}{h(g+hx)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(e + (f*(a + b*x))/(c + d*x))/(g + h*x)^2,x]
```

```
[Out] (d*F^(e + (b*f)/d - ((b*c - a*d)*f)/(d*(c + d*x))))/(h*(d*g - c*h)) - F^(e
+ (f*(a + b*x))/(c + d*x))/(h*(g + h*x)) + ((b*c - a*d)*f*F^(e + (f*(b*g -
a*h))/(d*g - c*h))*ExpIntegralEi[-(((b*c - a*d)*f*(g + h*x)*Log[F])/((d*g -
 c*h)*(c + d*x)))]*Log[F])/(d*g - c*h)^2
```

Rule 2178

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - (c*f)/d))*ExpIntegralEi[(f*g*(c + d*x)*Log[F])/d])/d, x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2230

```
Int[(F_)^((e_.) + ((f_.)*((a_.) + (b_.)*(x_)))/((c_.) + (d_.)*(x_)))*((g_.)
 + (h_.)*(x_))^(m_.), x_Symbol] :> Int[(g + h*x)^m*F^((d*e + b*f)/d - (f*(b
*c - a*d))/(d*(c + d*x))), x] /; FreeQ[{F, a, b, c, d, e, f, g, h, m}, x] &
& NeQ[b*c - a*d, 0] && EqQ[d*g - c*h, 0]
```

Rule 2231

```
Int[(F_)^((e_.) + ((f_.)*((a_.) + (b_.)*(x_)))/((c_.) + (d_.)*(x_)))/((g_.)
 + (h_.)*(x_)), x_Symbol] :> Dist[d/h, Int[F^(e + (f*(a + b*x))/(c + d*x))/
(c + d*x), x], x] - Dist[(d*g - c*h)/h, Int[F^(e + (f*(a + b*x))/(c + d*x))
/((c + d*x)*(g + h*x)), x], x] /; FreeQ[{F, a, b, c, d, e, f, g, h}, x] &&
NeQ[b*c - a*d, 0] && NeQ[d*g - c*h, 0]
```

Rule 2232

```
Int[(F_)^((e_.) + ((f_.)*((a_.) + (b_.)*(x_)))/((c_.) + (d_.)*(x_)))*((g_.)
 + (h_.)*(x_))^(m_), x_Symbol] :> Simp[((g + h*x)^(m + 1)*F^(e + (f*(a + b*
x))/(c + d*x)))/(h*(m + 1)), x] - Dist[(f*(b*c - a*d)*Log[F])/(h*(m + 1)),
Int[((g + h*x)^(m + 1)*F^(e + (f*(a + b*x))/(c + d*x)))/(c + d*x)^2, x], x]
 /; FreeQ[{F, a, b, c, d, e, f, g, h}, x] && NeQ[b*c - a*d, 0] && NeQ[d*g -
 c*h, 0] && ILtQ[m, -1]
```

Rule 2233

```
Int[(F_)^((e_.) + ((f_.)*((a_.) + (b_.)*(x_)))/((c_.) + (d_.)*(x_)))/(((g_.
) + (h_.)*(x_))*((i_.) + (j_.)*(x_))), x_Symbol] :> -Dist[d/(h*(d*i - c*j))
, Subst[Int[F^(e + (f*(b*i - a*j))/(d*i - c*j) - ((b*c - a*d)*f*x)/(d*i - c
*j))/x, x], x, (i + j*x)/(c + d*x)], x] /; FreeQ[{F, a, b, c, d, e, f, g, h
}, x] && EqQ[d*g - c*h, 0]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{(g+hx)^2}\,dx = -\frac{F^{e+\frac{f(a+bx)}{c+dx}}}{h(g+hx)} + \frac{((bc-ad)f\log(F))\int \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{(c+dx)^2(g+hx)}\,dx}{h}$$

$$= -\frac{F^{e+\frac{f(a+bx)}{c+dx}}}{h(g+hx)} + \frac{((bc-ad)f\log(F))\int \left(\frac{dF^{e+\frac{f(a+bx)}{c+dx}}}{(dg-ch)(c+dx)^2} - \frac{dF^{e+\frac{f(a+bx)}{c+dx}}h}{(dg-ch)^2(c+dx)} + \frac{F^{e+\frac{f(a+bx)}{c+dx}}h^2}{(dg-ch)^2(g+hx)}\right)dx}{h}$$

$$= -\frac{F^{e+\frac{f(a+bx)}{c+dx}}}{h(g+hx)} - \frac{(d(bc-ad)f\log(F))\int \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{c+dx}\,dx}{(dg-ch)^2} + \frac{((bc-ad)fh\log(F))\int \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{g+hx}\,dx}{(dg-ch)^2} + \frac{(d(\ldots}{\ldots}$$

$$= -\frac{F^{e+\frac{f(a+bx)}{c+dx}}}{h(g+hx)} - \frac{(d(bc-ad)f\log(F))\int \frac{F^{\frac{de+bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}}{c+dx}\,dx}{(dg-ch)^2} + \frac{(d(bc-ad)f\log(F))\int \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{c+dx}\,dx}{(dg-ch)^2} - \ldots$$

$$= \frac{dF^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}}{h(dg-ch)} - \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{h(g+hx)} + \frac{(bc-ad)fF^{e+\frac{bf}{d}}\operatorname{Ei}\left(-\frac{(bc-ad)f\log(F)}{d(c+dx)}\right)\log(F)}{(dg-ch)^2} + \frac{((bc-ad)f\log(F)\ldots}{\ldots}$$

$$= \frac{dF^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}}{h(dg-ch)} - \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{h(g+hx)} + \frac{(bc-ad)fF^{e+\frac{f(bg-ah)}{dg-ch}}\operatorname{Ei}\left(-\frac{(bc-ad)f(g+hx)\log(F)}{(dg-ch)(c+dx)}\right)\log(F)}{(dg-ch)^2}$$

Mathematica [F] time = 1.19, size = 0, normalized size = 0.00

$$\int \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{(g+hx)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[F^(e + (f*(a + b*x))/(c + d*x))/(g + h*x)^2,x]
```

```
[Out] Integrate[F^(e + (f*(a + b*x))/(c + d*x))/(g + h*x)^2, x]
```

fricas [A] time = 0.54, size = 220, normalized size = 1.38

$$\frac{\left((bc-ad)fhx+(bc-ad)fg\right)F^{\frac{(de+bf)g-(ce+af)h}{dg-ch}}\operatorname{Ei}\left(-\frac{\left((bc-ad)fhx+(bc-ad)fg\right)\log(F)}{cdg-c^2h+\left(d^2g-cdh\right)x}\right)\log(F)+\left(cdg-c^2h+\left(d^2g-cdh\right)x\right)\ldots}{d^2g^3-2\,cdg^2h+c^2gh^2+\left(d^2g^2h-2\,cdgh^2+c^2h^3\right)x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(e+f*(b*x+a)/(d*x+c))/(h*x+g)^2,x, algorithm="fricas")
```

```
[Out] (((b*c - a*d)*f*h*x + (b*c - a*d)*f*g)*F^(((d*e + b*f)*g - (c*e + a*f)*h)/(
d*g - c*h))*Ei(-((b*c - a*d)*f*h*x + (b*c - a*d)*f*g)*log(F)/(c*d*g - c^2*h
 + (d^2*g - c*d*h)*x))*log(F) + (c*d*g - c^2*h + (d^2*g - c*d*h)*x)*F^((c*e
 + a*f + (d*e + b*f)*x)/(d*x + c)))/(d^2*g^3 - 2*c*d*g^2*h + c^2*g*h^2 + (d
^2*g^2*h - 2*c*d*g*h^2 + c^2*h^3)*x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{e+\frac{(bx+a)f}{dx+c}}}{\left(hx+g\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(e+f*(b*x+a)/(d*x+c))/(h*x+g)^2,x, algorithm="giac")
```

```
[Out] integrate(F^(e + (b*x + a)*f/(d*x + c))/(h*x + g)^2, x)
```

maple [B] time = 0.21, size = 580, normalized size = 3.65

$$\frac{adf\,F^{\frac{bf+de}{d}}F^{\frac{(ad-bc)f}{(dx+c)d}}\ln(F)}{\left(ch-dg\right)^{2}\left(-\frac{afh\ln(F)}{ch-dg}+\frac{bfg\ln(F)}{ch-dg}-\frac{ceh\ln(F)}{ch-dg}+\frac{deg\ln(F)}{ch-dg}+\frac{af\ln(F)}{dx+c}-\frac{bcf\ln(F)}{(dx+c)d}+\frac{bf\ln(F)}{d}+e\ln(F)\right)}+\frac{adf\,F^{\frac{afh-bfg+ceh-deg}{ch-dg}}\,\mathrm{Ei}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(e+f*(b*x+a)/(d*x+c))/(h*x+g)^2,x)
```

```
[Out] f*ln(F)/(c*h-d*g)^2*F^((b*f+d*e)/d)*F^((a*d-b*c)/(d*x+c)/d*f)/(f*ln(F)/(d*x
+c)*a-f*ln(F)/d/(d*x+c)*b*c+ln(F)/d*b*f+ln(F)*e-1/(c*h-d*g)*ln(F)*a*f*h+1/(
c*h-d*g)*ln(F)*b*f*g-1/(c*h-d*g)*ln(F)*c*e*h+1/(c*h-d*g)*ln(F)*d*e*g)*a*d-f
*ln(F)/(c*h-d*g)^2*F^((b*f+d*e)/d)*F^((a*d-b*c)/(d*x+c)/d*f)/(f*ln(F)/(d*x+
c)*a-f*ln(F)/d/(d*x+c)*b*c+ln(F)/d*b*f+ln(F)*e-1/(c*h-d*g)*ln(F)*a*f*h+1/(c
*h-d*g)*ln(F)*b*f*g-1/(c*h-d*g)*ln(F)*c*e*h+1/(c*h-d*g)*ln(F)*d*e*g)*b*c+f*
ln(F)/(c*h-d*g)^2*F^((a*f*h-b*f*g+c*e*h-d*e*g)/(c*h-d*g))*Ei(1,-(a*d-b*c)/(
d*x+c)/d*f*ln(F)-(b*f+d*e)/d*ln(F)-(-a*f*h*ln(F)+b*f*g*ln(F)-c*e*h*ln(F)+d*
e*g*ln(F))/(c*h-d*g))*a*d-f*ln(F)/(c*h-d*g)^2*F^((a*f*h-b*f*g+c*e*h-d*e*g)/
(c*h-d*g))*Ei(1,-(a*d-b*c)/(d*x+c)/d*f*ln(F)-(b*f+d*e)/d*ln(F)-(-a*f*h*ln(F
)+b*f*g*ln(F)-c*e*h*ln(F)+d*e*g*ln(F))/(c*h-d*g))*b*c
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{e+\frac{(bx+a)f}{dx+c}}}{\left(hx+g\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(e+f*(b*x+a)/(d*x+c))/(h*x+g)^2,x, algorithm="maxima")
```

```
[Out] integrate(F^(e + (b*x + a)*f/(d*x + c))/(h*x + g)^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{F^{e+\frac{f\,(a+b\,x)}{c+d\,x}}}{{\left(g+h\,x\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(e + (f*(a + b*x))/(c + d*x))/(g + h*x)^2,x)
```

```
[Out] int(F^(e + (f*(a + b*x))/(c + d*x))/(g + h*x)^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(e+f*(b*x+a)/(d*x+c))/(h*x+g)**2,x)
```

```
[Out] Timed out
```

3.424 $\int \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{(g+hx)^3}\,dx$

Optimal. Leaf size=366

$$\frac{d^2F^{-\frac{f(bc-ad)}{d(c+dx)}+\frac{bf}{d}+e}}{2h(dg-ch)^2}+\frac{f^2h\log^2(F)(bc-ad)^2F^{\frac{f(bg-ah)}{dg-ch}+e}\text{Ei}\left(-\frac{(bc-ad)f(g+hx)\log(F)}{(dg-ch)(c+dx)}\right)}{2(dg-ch)^4}+\frac{df\log(F)(bc-ad)F^{\frac{f(bg-ah)}{dg-ch}+e}\text{Ei}\left(-\frac{(bc-\cdots}{\cdots}\right.}{(dg-ch)^3}$$

```
[Out] 1/2*d^2*F^(e+b*f/d-(-a*d+b*c)*f/d/(d*x+c))/h/(-c*h+d*g)^2-1/2*F^(e+f*(b*x+a
)/(d*x+c))/h/(h*x+g)^2+1/2*d*(-a*d+b*c)*f*F^(e+b*f/d-(-a*d+b*c)*f/d/(d*x+c)
)*ln(F)/(-c*h+d*g)^3-1/2*(-a*d+b*c)*f*F^(e+f*(b*x+a)/(d*x+c))*ln(F)/(-c*h+d
*g)^2/(h*x+g)+d*(-a*d+b*c)*f*F^(e+f*(-a*h+b*g)/(-c*h+d*g))*Ei(-(-a*d+b*c)*f
*(h*x+g)*ln(F)/(-c*h+d*g)/(d*x+c))*ln(F)/(-c*h+d*g)^3+1/2*(-a*d+b*c)^2*f^2*
F^(e+f*(-a*h+b*g)/(-c*h+d*g))*h*Ei(-(-a*d+b*c)*f*(h*x+g)*ln(F)/(-c*h+d*g)/(
d*x+c))*ln(F)^2/(-c*h+d*g)^4
```

Rubi [A] time = 4.76, antiderivative size = 366, normalized size of antiderivative = 1.00, number of steps used = 24, number of rules used = 8, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308, Rules used = {2232, 6742, 2230, 2209, 2210, 2231, 2233, 2178}

$$\frac{d^2F^{-\frac{f(bc-ad)}{d(c+dx)}+\frac{bf}{d}+e}}{2h(dg-ch)^2}+\frac{f^2h\log^2(F)(bc-ad)^2F^{\frac{f(bg-ah)}{dg-ch}+e}\text{Ei}\left(-\frac{(bc-ad)f(g+hx)\log(F)}{(dg-ch)(c+dx)}\right)}{2(dg-ch)^4}+\frac{df\log(F)(bc-ad)F^{\frac{f(bg-ah)}{dg-ch}+e}\text{Ei}\left(-\frac{(bc-\cdots}{\cdots}\right.}{(dg-ch)^3}$$

Antiderivative was successfully verified.

```
[In] Int[F^(e + (f*(a + b*x))/(c + d*x))/(g + h*x)^3,x]
```

```
[Out] (d^2*F^(e + (b*f)/d - ((b*c - a*d)*f)/(d*(c + d*x))))/(2*h*(d*g - c*h)^2) -
 F^(e + (f*(a + b*x))/(c + d*x))/(2*h*(g + h*x)^2) + (d*(b*c - a*d)*f*F^(e
+ (b*f)/d - ((b*c - a*d)*f)/(d*(c + d*x)))*Log[F])/(2*(d*g - c*h)^3) - ((b*
c - a*d)*f*F^(e + (f*(a + b*x))/(c + d*x))*Log[F])/(2*(d*g - c*h)^2*(g + h*
x)) + (d*(b*c - a*d)*f*F^(e + (f*(b*g - a*h))/(d*g - c*h))*ExpIntegralEi[-(
((b*c - a*d)*f*(g + h*x)*Log[F])/((d*g - c*h)*(c + d*x)))]*Log[F])/(d*g - c
*h)^3 + ((b*c - a*d)^2*f^2*F^(e + (f*(b*g - a*h))/(d*g - c*h))*h*ExpIntegra
lEi[-(((b*c - a*d)*f*(g + h*x)*Log[F])/((d*g - c*h)*(c + d*x)))]*Log[F]^2)/
(2*(d*g - c*h)^4)
```

Rule 2178

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - (c*f)/d))*ExpIntegralEi[(f*g*(c + d*x)*Log[F])/d])/d, x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2230

```
Int[(F_)^((e_.) + ((f_.)*((a_.) + (b_.)*(x_)))/((c_.) + (d_.)*(x_)))*((g_.)
 + (h_.)*(x_))^(m_.), x_Symbol] :> Int[(g + h*x)^m*F^((d*e + b*f)/d - (f*(b
*c - a*d))/(d*(c + d*x))), x] /; FreeQ[{F, a, b, c, d, e, f, g, h, m}, x] &
& NeQ[b*c - a*d, 0] && EqQ[d*g - c*h, 0]
```

Rule 2231

```
Int[(F_)^((e_.) + ((f_.)*((a_.) + (b_.)*(x_)))/((c_.) + (d_.)*(x_)))/((g_.)
 + (h_.)*(x_)), x_Symbol] :> Dist[d/h, Int[F^(e + (f*(a + b*x))/(c + d*x))/
(c + d*x), x], x] - Dist[(d*g - c*h)/h, Int[F^(e + (f*(a + b*x))/(c + d*x))
/((c + d*x)*(g + h*x)), x], x] /; FreeQ[{F, a, b, c, d, e, f, g, h}, x] &&
NeQ[b*c - a*d, 0] && NeQ[d*g - c*h, 0]
```

Rule 2232

```
Int[(F_)^((e_.) + ((f_.)*((a_.) + (b_.)*(x_)))/((c_.) + (d_.)*(x_)))*((g_.)
 + (h_.)*(x_))^(m_), x_Symbol] :> Simp[((g + h*x)^(m + 1)*F^(e + (f*(a + b*
x))/(c + d*x)))/(h*(m + 1)), x] - Dist[(f*(b*c - a*d)*Log[F])/(h*(m + 1)),
Int[((g + h*x)^(m + 1)*F^(e + (f*(a + b*x))/(c + d*x)))/(c + d*x)^2, x], x]
 /; FreeQ[{F, a, b, c, d, e, f, g, h}, x] && NeQ[b*c - a*d, 0] && NeQ[d*g -
 c*h, 0] && ILtQ[m, -1]
```

Rule 2233

```
Int[(F_)^((e_.) + ((f_.)*((a_.) + (b_.)*(x_)))/((c_.) + (d_.)*(x_)))/(((g_.
) + (h_.)*(x_))*((i_.) + (j_.)*(x_))), x_Symbol] :> -Dist[d/(h*(d*i - c*j))
, Subst[Int[F^(e + (f*(b*i - a*j))/(d*i - c*j) - ((b*c - a*d)*f*x)/(d*i - c
*j))/x, x], x, (i + j*x)/(c + d*x)], x] /; FreeQ[{F, a, b, c, d, e, f, g, h
}, x] && EqQ[d*g - c*h, 0]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{(g+hx)^3}\,dx = -\frac{F^{e+\frac{f(a+bx)}{c+dx}}}{2h(g+hx)^2} + \frac{((bc-ad)f\log(F))\int \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{(c+dx)^2(g+hx)^2}\,dx}{2h}$$

$$= -\frac{F^{e+\frac{f(a+bx)}{c+dx}}}{2h(g+hx)^2} + \frac{((bc-ad)f\log(F))\int \left(\frac{d^2F^{e+\frac{f(a+bx)}{c+dx}}}{(dg-ch)^2(c+dx)^2} - \frac{2d^2F^{e+\frac{f(a+bx)}{c+dx}}h}{(dg-ch)^3(c+dx)} + \frac{F^{e+\frac{f(a+bx)}{c+dx}}h^2}{(dg-ch)^2(g+hx)^2} + \frac{2dF^{e+\frac{f(a+b}{c+dx}}}{(dg-ch)^3(g}\right.}{2h}$$

$$= -\frac{F^{e+\frac{f(a+bx)}{c+dx}}}{2h(g+hx)^2} - \frac{\left(d^2(bc-ad)f\log(F)\right)\int \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{c+dx}\,dx}{(dg-ch)^3} + \frac{(d(bc-ad)fh\log(F))\int \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{g+hx}\,dx}{(dg-ch)^3} +$$

$$= -\frac{F^{e+\frac{f(a+bx)}{c+dx}}}{2h(g+hx)^2} - \frac{(bc-ad)fF^{e+\frac{f(a+bx)}{c+dx}}\log(F)}{2(dg-ch)^2(g+hx)} - \frac{\left(d^2(bc-ad)f\log(F)\right)\int \frac{F^{\frac{de+bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}}{c+dx}\,dx}{(dg-ch)^3} + \frac{\left(d^2(b\right.}{}$$

$$= \frac{d^2F^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}}{2h(dg-ch)^2} - \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{2h(g+hx)^2} - \frac{(bc-ad)fF^{e+\frac{f(a+bx)}{c+dx}}\log(F)}{2(dg-ch)^2(g+hx)} + \frac{d(bc-ad)fF^{e+\frac{bf}{d}}\text{Ei}\left(-\frac{(bc-ad)f\log}{d(c+dx)}\right.}{(dg-ch)^3}$$

$$= \frac{d^2F^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}}{2h(dg-ch)^2} - \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{2h(g+hx)^2} - \frac{(bc-ad)fF^{e+\frac{f(a+bx)}{c+dx}}\log(F)}{2(dg-ch)^2(g+hx)} + \frac{d(bc-ad)fF^{e+\frac{f(bg-ah)}{dg-ch}}\text{Ei}\left(-\frac{(bc-ad}{(dg}\right.}{(dg-ch)^3}$$

$$= \frac{d^2F^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}}{2h(dg-ch)^2} - \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{2h(g+hx)^2} - \frac{(bc-ad)fF^{e+\frac{f(a+bx)}{c+dx}}\log(F)}{2(dg-ch)^2(g+hx)} + \frac{d(bc-ad)fF^{e+\frac{f(bg-ah)}{dg-ch}}\text{Ei}\left(-\frac{(bc-ad}{(dg}\right.}{(dg-ch)^3}$$

$$= \frac{d^2F^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}}{2h(dg-ch)^2} - \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{2h(g+hx)^2} + \frac{d(bc-ad)fF^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}\log(F)}{2(dg-ch)^3} - \frac{(bc-ad)fF^{e+\frac{f(a+bx)}{c+dx}}\log(F)}{2(dg-ch)^2(g+hx)}$$

$$= \frac{d^2F^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}}{2h(dg-ch)^2} - \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{2h(g+hx)^2} + \frac{d(bc-ad)fF^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}\log(F)}{2(dg-ch)^3} - \frac{(bc-ad)fF^{e+\frac{f(a+bx)}{c+dx}}\log(F)}{2(dg-ch)^2(g+hx)}$$

Mathematica [F] time = 0.52, size = 0, normalized size = 0.00

$$\int \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{(g+hx)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[F^(e + (f*(a + b*x))/(c + d*x))/(g + h*x)^3,x]
```

```
[Out] Integrate[F^(e + (f*(a + b*x))/(c + d*x))/(g + h*x)^3, x]
```

fricas [B] time = 0.48, size = 755, normalized size = 2.06

$$\frac{\left(\left(\left(b^2c^2 - 2\,abcd + a^2d^2\right)f^2h^3x^2 + 2\left(b^2c^2 - 2\,abcd + a^2d^2\right)f^2gh^2x + \left(b^2c^2 - 2\,abcd + a^2d^2\right)f^2g^2h\right)\log(F)^2 + 2\left(\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(e+f*(b*x+a)/(d*x+c))/(h*x+g)^3,x, algorithm="fricas")
```

```
[Out] 1/2*((((b^2*c^2 - 2*a*b*c*d + a^2*d^2)*f^2*h^3*x^2 + 2*(b^2*c^2 - 2*a*b*c*d
 + a^2*d^2)*f^2*g*h^2*x + (b^2*c^2 - 2*a*b*c*d + a^2*d^2)*f^2*g^2*h)*log(F)
^2 + 2*((b*c*d^2 - a*d^3)*f*g^3 - (b*c^2*d - a*c*d^2)*f*g^2*h + ((b*c*d^2 -
 a*d^3)*f*g*h^2 - (b*c^2*d - a*c*d^2)*f*h^3)*x^2 + 2*((b*c*d^2 - a*d^3)*f*g
^2*h - (b*c^2*d - a*c*d^2)*f*g*h^2)*x)*log(F))*F^((((d*e + b*f)*g - (c*e + a
*f)*h)/(d*g - c*h))*Ei(-((b*c - a*d)*f*h*x + (b*c - a*d)*f*g)*log(F)/(c*d*g
 - c^2*h + (d^2*g - c*d*h)*x)) + (2*c*d^3*g^3 - 5*c^2*d^2*g^2*h + 4*c^3*d*g
*h^2 - c^4*h^3 + (d^4*g^2*h - 2*c*d^3*g*h^2 + c^2*d^2*h^3)*x^2 + 2*(d^4*g^3
 - 2*c*d^3*g^2*h + c^2*d^2*g*h^2)*x + ((b*c^2*d - a*c*d^2)*f*g^2*h - (b*c^3
 - a*c^2*d)*f*g*h^2 + ((b*c*d^2 - a*d^3)*f*g*h^2 - (b*c^2*d - a*c*d^2)*f*h^
3)*x^2 + ((b*c*d^2 - a*d^3)*f*g^2*h - (b*c^3 - a*c^2*d)*f*h^3)*x)*log(F))*F
^((c*e + a*f + (d*e + b*f)*x)/(d*x + c)))/(d^4*g^6 - 4*c*d^3*g^5*h + 6*c^2*
d^2*g^4*h^2 - 4*c^3*d*g^3*h^3 + c^4*g^2*h^4 + (d^4*g^4*h^2 - 4*c*d^3*g^3*h^
3 + 6*c^2*d^2*g^2*h^4 - 4*c^3*d*g*h^5 + c^4*h^6)*x^2 + 2*(d^4*g^5*h - 4*c*d
^3*g^4*h^2 + 6*c^2*d^2*g^3*h^3 - 4*c^3*d*g^2*h^4 + c^4*g*h^5)*x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{e+\frac{(bx+a)f}{dx+c}}}{\left(hx+g\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(e+f*(b*x+a)/(d*x+c))/(h*x+g)^3,x, algorithm="giac")

[Out] integrate(F^(e + (b*x + a)*f/(d*x + c))/(h*x + g)^3, x)

maple [B] time = 0.25, size = 2014, normalized size = 5.50

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int(F^(e+f*(b*x+a)/(d*x+c))/(h*x+g)^3,x)

[Out] -ln(F)*f*d^2/(c*h-d*g)^3*F^((b*f+d*e)/d)*F^((a*d-b*c)/(d*x+c)/d*f)/(-1/(c*h -d*g)*a*f*h*ln(F)+1/(c*h-d*g)*b*f*g*ln(F)-1/(c*h-d*g)*c*e*h*ln(F)+1/(c*h-d* g)*d*e*g*ln(F)+1/(d*x+c)*a*f*ln(F)-1/(d*x+c)*b*c/d*f*ln(F)+b/d*f*ln(F)+e*ln (F))*a+ln(F)*f*d/(c*h-d*g)^3*F^((b*f+d*e)/d)*F^((a*d-b*c)/(d*x+c)/d*f)/(-1/ (c*h-d*g)*a*f*h*ln(F)+1/(c*h-d*g)*b*f*g*ln(F)-1/(c*h-d*g)*c*e*h*ln(F)+1/(c* h-d*g)*d*e*g*ln(F)+1/(d*x+c)*a*f*ln(F)-1/(d*x+c)*b*c/d*f*ln(F)+b/d*f*ln(F)+ e*ln(F))*b*c-ln(F)*f*d^2/(c*h-d*g)^3*F^((a*f*h-b*f*g+c*e*h-d*e*g)/(c*h-d*g))*Ei(1,-(a*d-b*c)/(d*x+c)/d*f*ln(F)-(b*f+d*e)/d*ln(F)-(-a*f*h*ln(F)+b*f*g*l n(F)-c*e*h*ln(F)+d*e*g*ln(F))/(c*h-d*g))*a+ln(F)*f*d/(c*h-d*g)^3*F^((a*f*h- b*f*g+c*e*h-d*e*g)/(c*h-d*g))*Ei(1,-(a*d-b*c)/(d*x+c)/d*f*ln(F)-(b*f+d*e)/d *ln(F)-(-a*f*h*ln(F)+b*f*g*ln(F)-c*e*h*ln(F)+d*e*g*ln(F))/(c*h-d*g))*b*c-1/ 2*ln(F)^2*f^2*d^2*h/(c*h-d*g)^4*F^((b*f+d*e)/d)*F^((a*d-b*c)/(d*x+c)/d*f)/(-1/(c*h-d*g)*a*f*h*ln(F)+1/(c*h-d*g)*b*f*g*ln(F)-1/(c*h-d*g)*c*e*h*ln(F)+1/ (c*h-d*g)*d*e*g*ln(F)+1/(d*x+c)*a*f*ln(F)-1/(d*x+c)*b*c/d*f*ln(F)+b/d*f*ln(F)+e*ln(F))^2*a^2+ln(F)^2*f^2*d*h/(c*h-d*g)^4*F^((b*f+d*e)/d)*F^((a*d-b*c)/ (d*x+c)/d*f)/(-1/(c*h-d*g)*a*f*h*ln(F)+1/(c*h-d*g)*b*f*g*ln(F)-1/(c*h-d*g)* c*e*h*ln(F)+1/(c*h-d*g)*d*e*g*ln(F)+1/(d*x+c)*a*f*ln(F)-1/(d*x+c)*b*c/d*f*l n(F)+b/d*f*ln(F)+e*ln(F))^2*a*b*c-1/2*ln(F)^2*f^2*h/(c*h-d*g)^4*F^((b*f+d*e)/d)*F^((a*d-b*c)/(d*x+c)/d*f)/(-1/(c*h-d*g)*a*f*h*ln(F)+1/(c*h-d*g)*b*f*g* ln(F)-1/(c*h-d*g)*c*e*h*ln(F)+1/(c*h-d*g)*d*e*g*ln(F)+1/(d*x+c)*a*f*ln(F)-1 /(d*x+c)*b*c/d*f*ln(F)+b/d*f*ln(F)+e*ln(F))^2*b^2*c^2-1/2*ln(F)^2*f^2*d^2*h /(c*h-d*g)^4*F^((b*f+d*e)/d)*F^((a*d-b*c)/(d*x+c)/d*f)/(-1/(c*h-d*g)*a*f*h* ln(F)+1/(c*h-d*g)*b*f*g*ln(F)-1/(c*h-d*g)*c*e*h*ln(F)+1/(c*h-d*g)*d*e*g*ln(F)+1/(d*x+c)*a*f*ln(F)-1/(d*x+c)*b*c/d*f*ln(F)+b/d*f*ln(F)+e*ln(F))*a^2+ln(F)^2*f^2*d*h/(c*h-d*g)^4*F^((b*f+d*e)/d)*F^((a*d-b*c)/(d*x+c)/d*f)/(-1/(c*h -d*g)*a*f*h*ln(F)+1/(c*h-d*g)*b*f*g*ln(F)-1/(c*h-d*g)*c*e*h*ln(F)+1/(c*h-d* g)*d*e*g*ln(F)+1/(d*x+c)*a*f*ln(F)-1/(d*x+c)*b*c/d*f*ln(F)+b/d*f*ln(F)+e*ln (F))*a*b*c-1/2*ln(F)^2*f^2*h/(c*h-d*g)^4*F^((b*f+d*e)/d)*F^((a*d-b*c)/(d*x+ c)/d*f)/(-1/(c*h-d*g)*a*f*h*ln(F)+1/(c*h-d*g)*b*f*g*ln(F)-1/(c*h-d*g)*c*e*h *ln(F)+1/(c*h-d*g)*d*e*g*ln(F)+1/(d*x+c)*a*f*ln(F)-1/(d*x+c)*b*c/d*f*ln(F)+ b/d*f*ln(F)+e*ln(F))*b^2*c^2-1/2*ln(F)^2*f^2*d^2*h/(c*h-d*g)^4*F^((a*f*h-b* f*g+c*e*h-d*e*g)/(c*h-d*g))*Ei(1,-(a*d-b*c)/(d*x+c)/d*f*ln(F)-(b*f+d*e)/d*l n(F)-(-a*f*h*ln(F)+b*f*g*ln(F)-c*e*h*ln(F)+d*e*g*ln(F))/(c*h-d*g))*a^2+ln(F)^2*f^2*d*h/(c*h-d*g)^4*F^((a*f*h-b*f*g+c*e*h-d*e*g)/(c*h-d*g))*Ei(1,-(a*d-

```
b*c)/(d*x+c)/d*f*ln(F)-(b*f+d*e)/d*ln(F)-(-a*f*h*ln(F)+b*f*g*ln(F)-c*e*h*ln
(F)+d*e*g*ln(F))/(c*h-d*g))*a*b*c-1/2*ln(F)^2*f^2*h/(c*h-d*g)^4*F^((a*f*h-b
*f*g+c*e*h-d*e*g)/(c*h-d*g))*Ei(1,-(a*d-b*c)/(d*x+c)/d*f*ln(F)-(b*f+d*e)/d*
ln(F)-(-a*f*h*ln(F)+b*f*g*ln(F)-c*e*h*ln(F)+d*e*g*ln(F))/(c*h-d*g))*b^2*c^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{e+\frac{(bx+a)f}{dx+c}}}{(hx+g)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(e+f*(b*x+a)/(d*x+c))/(h*x+g)^3,x, algorithm="maxima")
[Out] integrate(F^(e + (b*x + a)*f/(d*x + c))/(h*x + g)^3, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{F^{e+\frac{f\,(a+b\,x)}{c+d\,x}}}{{(g+h\,x)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(e + (f*(a + b*x))/(c + d*x))/(g + h*x)^3,x)
[Out] int(F^(e + (f*(a + b*x))/(c + d*x))/(g + h*x)^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(e+f*(b*x+a)/(d*x+c))/(h*x+g)**3,x)
[Out] Timed out
```

3.425 $\int \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{(g+hx)^4}\,dx$

Optimal. Leaf size=634

$$\frac{d^3F^{-\frac{f(bc-ad)}{d(c+dx)}+\frac{bf}{d}+e}}{3h(dg-ch)^3}+\frac{d^2f\log(F)(bc-ad)F^{\frac{f(bg-ah)}{dg-ch}+e}\mathrm{Ei}\left(-\frac{(bc-ad)f(g+hx)\log(F)}{(dg-ch)(c+dx)}\right)}{(dg-ch)^4}+\frac{5d^2f\log(F)(bc-ad)F^{-\frac{f(bc-ad)}{d(c+dx)}+\frac{bf}{d}+e}}{6(dg-ch)^4}+\frac{f^3}{}$$

```
[Out] 1/3*d^3*F^(e+b*f/d-(-a*d+b*c)*f/d/(d*x+c))/h/(-c*h+d*g)^3-1/3*F^(e+f*(b*x+a
)/(d*x+c))/h/(h*x+g)^3+5/6*d^2*(-a*d+b*c)*f*F^(e+b*f/d-(-a*d+b*c)*f/d/(d*x+
c))*ln(F)/(-c*h+d*g)^4-1/6*(-a*d+b*c)*f*F^(e+f*(b*x+a)/(d*x+c))*ln(F)/(-c*h
+d*g)^2/(h*x+g)^2-2/3*d*(-a*d+b*c)*f*F^(e+f*(b*x+a)/(d*x+c))*ln(F)/(-c*h+d*
g)^3/(h*x+g)+d^2*(-a*d+b*c)*f*F^(e+f*(-a*h+b*g)/(-c*h+d*g))*Ei(-(-a*d+b*c)*
f*(h*x+g)*ln(F)/(-c*h+d*g)/(d*x+c))*ln(F)/(-c*h+d*g)^4+1/6*d*(-a*d+b*c)^2*f
^2*F^(e+b*f/d-(-a*d+b*c)*f/d/(d*x+c))*h*ln(F)^2/(-c*h+d*g)^5-1/6*(-a*d+b*c)
^2*f^2*F^(e+f*(b*x+a)/(d*x+c))*h*ln(F)^2/(-c*h+d*g)^4/(h*x+g)+d*(-a*d+b*c)^
2*f^2*F^(e+f*(-a*h+b*g)/(-c*h+d*g))*h*Ei(-(-a*d+b*c)*f*(h*x+g)*ln(F)/(-c*h+
d*g)/(d*x+c))*ln(F)^2/(-c*h+d*g)^5+1/6*(-a*d+b*c)^3*f^3*F^(e+f*(-a*h+b*g)/(
-c*h+d*g))*h^2*Ei(-(-a*d+b*c)*f*(h*x+g)*ln(F)/(-c*h+d*g)/(d*x+c))*ln(F)^3/(
-c*h+d*g)^6
```

Rubi [A] time = 9.41, antiderivative size = 634, normalized size of antiderivative = 1.00, number of steps used = 48, number of rules used = 8, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308, Rules used = {2232, 6742, 2230, 2209, 2210, 2231, 2233, 2178}

$$\frac{d^2f\log(F)(bc-ad)F^{\frac{f(bg-ah)}{dg-ch}+e}\mathrm{Ei}\left(-\frac{(bc-ad)f(g+hx)\log(F)}{(dg-ch)(c+dx)}\right)}{(dg-ch)^4}+\frac{d^3F^{-\frac{f(bc-ad)}{d(c+dx)}+\frac{bf}{d}+e}}{3h(dg-ch)^3}+\frac{5d^2f\log(F)(bc-ad)F^{-\frac{f(bc-ad)}{d(c+dx)}+\frac{bf}{d}+e}}{6(dg-ch)^4}+\frac{f^3}{}$$

Antiderivative was successfully verified.

```
[In] Int[F^(e + (f*(a + b*x))/(c + d*x))/(g + h*x)^4,x]
```

```
[Out] (d^3*F^(e + (b*f)/d - ((b*c - a*d)*f)/(d*(c + d*x))))/(3*h*(d*g - c*h)^3) -
 F^(e + (f*(a + b*x))/(c + d*x))/(3*h*(g + h*x)^3) + (5*d^2*(b*c - a*d)*f*F
^(e + (b*f)/d - ((b*c - a*d)*f)/(d*(c + d*x)))*Log[F])/(6*(d*g - c*h)^4) -
((b*c - a*d)*f*F^(e + (f*(a + b*x))/(c + d*x))*Log[F])/(6*(d*g - c*h)^2*(g
+ h*x)^2) - (2*d*(b*c - a*d)*f*F^(e + (f*(a + b*x))/(c + d*x))*Log[F])/(3*(
d*g - c*h)^3*(g + h*x)) + (d^2*(b*c - a*d)*f*F^(e + (f*(b*g - a*h))/(d*g -
c*h))*ExpIntegralEi[-(((b*c - a*d)*f*(g + h*x)*Log[F])/((d*g - c*h)*(c + d*
x)))]*Log[F])/(d*g - c*h)^4 + (d*(b*c - a*d)^2*f^2*F^(e + (b*f)/d - ((b*c -
 a*d)*f)/(d*(c + d*x)))*h*Log[F]^2)/(6*(d*g - c*h)^5) - ((b*c - a*d)^2*f^2*
F^(e + (f*(a + b*x))/(c + d*x))*h*Log[F]^2)/(6*(d*g - c*h)^4*(g + h*x)) + (
```

```
d*(b*c - a*d)^2*f^2*F^(e + (f*(b*g - a*h))/(d*g - c*h))*h*ExpIntegralEi[-((
(b*c - a*d)*f*(g + h*x)*Log[F])/((d*g - c*h)*(c + d*x)))]*Log[F]^2)/(d*g -
c*h)^5 + ((b*c - a*d)^3*f^3*F^(e + (f*(b*g - a*h))/(d*g - c*h))*h^2*ExpInte
gralEi[-(((b*c - a*d)*f*(g + h*x)*Log[F])/((d*g - c*h)*(c + d*x)))]*Log[F]^
3)/(6*(d*g - c*h)^6)
```

Rule 2178

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - (c*f)/d))*ExpIntegralEi[(f*g*(c + d*x)*Log[F])/d])/d, x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2210

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))/((e_.) + (f_.)*(x_)), x_
Symbol] :> Simp[(F^a*ExpIntegralEi[b*(c + d*x)^n*Log[F]])/(f*n), x] /; Free
Q[{F, a, b, c, d, e, f, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2230

```
Int[(F_)^((e_.) + ((f_.)*((a_.) + (b_.)*(x_)))/((c_.) + (d_.)*(x_)))*((g_.)
 + (h_.)*(x_))^(m_.), x_Symbol] :> Int[(g + h*x)^m*F^((d*e + b*f)/d - (f*(b
*c - a*d))/(d*(c + d*x))), x] /; FreeQ[{F, a, b, c, d, e, f, g, h, m}, x] &
& NeQ[b*c - a*d, 0] && EqQ[d*g - c*h, 0]
```

Rule 2231

```
Int[(F_)^((e_.) + ((f_.)*((a_.) + (b_.)*(x_)))/((c_.) + (d_.)*(x_)))/((g_.)
 + (h_.)*(x_)), x_Symbol] :> Dist[d/h, Int[F^(e + (f*(a + b*x))/(c + d*x))/
(c + d*x), x], x] - Dist[(d*g - c*h)/h, Int[F^(e + (f*(a + b*x))/(c + d*x))
/((c + d*x)*(g + h*x)), x], x] /; FreeQ[{F, a, b, c, d, e, f, g, h}, x] &&
NeQ[b*c - a*d, 0] && NeQ[d*g - c*h, 0]
```

Rule 2232

```
Int[(F_)^((e_.) + ((f_.)*((a_.) + (b_.)*(x_)))/((c_.) + (d_.)*(x_)))*((g_.)
 + (h_.)*(x_))^(m_), x_Symbol] :> Simp[((g + h*x)^(m + 1)*F^(e + (f*(a + b*
x))/(c + d*x)))/(h*(m + 1)), x] - Dist[(f*(b*c - a*d)*Log[F])/(h*(m + 1)),
Int[((g + h*x)^(m + 1)*F^(e + (f*(a + b*x))/(c + d*x)))/(c + d*x)^2, x], x]
```

```
/; FreeQ[{F, a, b, c, d, e, f, g, h}, x] && NeQ[b*c - a*d, 0] && NeQ[d*g -
c*h, 0] && ILtQ[m, -1]
```

Rule 2233

```
Int[(F_)^((e_.) + ((f_.)*((a_.) + (b_.)*(x_)))/((c_.) + (d_.)*(x_)))/(((g_.
) + (h_.)*(x_))*((i_.) + (j_.)*(x_))), x_Symbol] :> -Dist[d/(h*(d*i - c*j))
, Subst[Int[F^(e + (f*(b*i - a*j))/(d*i - c*j) - ((b*c - a*d)*f*x)/(d*i - c
*j))/x, x], x, (i + j*x)/(c + d*x)], x] /; FreeQ[{F, a, b, c, d, e, f, g, h
}, x] && EqQ[d*g - c*h, 0]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{(g+hx)^4}\,dx = -\frac{F^{e+\frac{f(a+bx)}{c+dx}}}{3h(g+hx)^3} + \frac{((bc-ad)f\log(F))\int \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{(c+dx)^2(g+hx)^3}\,dx}{3h}$$

$$= -\frac{F^{e+\frac{f(a+bx)}{c+dx}}}{3h(g+hx)^3} + \frac{((bc-ad)f\log(F))\int \left(\frac{d^3F^{e+\frac{f(a+bx)}{c+dx}}}{(dg-ch)^3(c+dx)^2} - \frac{3d^3F^{e+\frac{f(a+bx)}{c+dx}}h}{(dg-ch)^4(c+dx)} + \frac{F^{e+\frac{f(a+bx)}{c+dx}}h^2}{(dg-ch)^2(g+hx)^3} + \frac{2dF^{e+\frac{f(a}{c}}}{(dg-ch)^3(}\right.}{3h}$$

$$= -\frac{F^{e+\frac{f(a+bx)}{c+dx}}}{3h(g+hx)^3} - \frac{\left(d^3(bc-ad)f\log(F)\right)\int \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{c+dx}\,dx}{(dg-ch)^4} + \frac{\left(d^2(bc-ad)fh\log(F)\right)\int \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{g+hx}\,dx}{(dg-ch)^4}$$

$$= -\frac{F^{e+\frac{f(a+bx)}{c+dx}}}{3h(g+hx)^3} - \frac{(bc-ad)fF^{e+\frac{f(a+bx)}{c+dx}}\log(F)}{6(dg-ch)^2(g+hx)^2} - \frac{2d(bc-ad)fF^{e+\frac{f(a+bx)}{c+dx}}\log(F)}{3(dg-ch)^3(g+hx)} - \frac{\left(d^3(bc-ad)f\,\mathrm{l}\right.}{}$$

$$= \frac{d^3F^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}}{3h(dg-ch)^3} - \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{3h(g+hx)^3} - \frac{(bc-ad)fF^{e+\frac{f(a+bx)}{c+dx}}\log(F)}{6(dg-ch)^2(g+hx)^2} - \frac{2d(bc-ad)fF^{e+\frac{f(a+bx)}{c+dx}}\log(F)}{3(dg-ch)^3(g+hx)} +$$

$$= \frac{d^3F^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}}{3h(dg-ch)^3} - \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{3h(g+hx)^3} - \frac{(bc-ad)fF^{e+\frac{f(a+bx)}{c+dx}}\log(F)}{6(dg-ch)^2(g+hx)^2} - \frac{2d(bc-ad)fF^{e+\frac{f(a+bx)}{c+dx}}\log(F)}{3(dg-ch)^3(g+hx)} +$$

$$= \frac{d^3F^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}}{3h(dg-ch)^3} - \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{3h(g+hx)^3} - \frac{(bc-ad)fF^{e+\frac{f(a+bx)}{c+dx}}\log(F)}{6(dg-ch)^2(g+hx)^2} - \frac{2d(bc-ad)fF^{e+\frac{f(a+bx)}{c+dx}}\log(F)}{3(dg-ch)^3(g+hx)} +$$

$$= \frac{d^3F^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}}{3h(dg-ch)^3} - \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{3h(g+hx)^3} + \frac{5d^2(bc-ad)fF^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}\log(F)}{6(dg-ch)^4} - \frac{(bc-ad)fF^{e+\frac{f(a+bx)}{c+dx}}\log}{6(dg-ch)^2(g+hx)^2}$$

$$= \frac{d^3F^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}}{3h(dg-ch)^3} - \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{3h(g+hx)^3} + \frac{5d^2(bc-ad)fF^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}\log(F)}{6(dg-ch)^4} - \frac{(bc-ad)fF^{e+\frac{f(a+bx)}{c+dx}}\log}{6(dg-ch)^2(g+hx)^2}$$

$$= \frac{d^3F^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}}{3h(dg-ch)^3} - \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{3h(g+hx)^3} + \frac{5d^2(bc-ad)fF^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}\log(F)}{6(dg-ch)^4} - \frac{(bc-ad)fF^{e+\frac{f(a+bx)}{c+dx}}\log}{6(dg-ch)^2(g+hx)^2}$$

$$= \frac{d^3F^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}}{3h(dg-ch)^3} - \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{3h(g+hx)^3} + \frac{5d^2(bc-ad)fF^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}\log(F)}{6(dg-ch)^4} - \frac{(bc-ad)fF^{e+\frac{f(a+bx)}{c+dx}}\log}{6(dg-ch)^2(g+hx)^2}$$

$$= \frac{d^3F^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}}{3h(dg-ch)^3} - \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{3h(g+hx)^3} + \frac{5d^2(bc-ad)fF^{e+\frac{bf}{d}-\frac{(bc-ad)f}{d(c+dx)}}\log(F)}{6(dg-ch)^4} - \frac{(bc-ad)fF^{e+\frac{f(a+bx)}{c+dx}}\log}{6(dg-ch)^2(g+hx)^2}$$

Mathematica [F] time = 0.99, size = 0, normalized size = 0.00

$$\int \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{(g+hx)^4}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[F^(e + (f*(a + b*x))/(c + d*x))/(g + h*x)^4,x]
```

```
[Out] Integrate[F^(e + (f*(a + b*x))/(c + d*x))/(g + h*x)^4, x]
```

fricas [B] time = 0.51, size = 2250, normalized size = 3.55

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(e+f*(b*x+a)/(d*x+c))/(h*x+g)^4,x, algorithm="fricas")
```

```
[Out] 1/6*((((b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*f^3*h^5*x^3 + 3*
(b^3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*f^3*g*h^4*x^2 + 3*(b^3*
c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*f^3*g^2*h^3*x + (b^3*c^3 - 3
*a*b^2*c^2*d + 3*a^2*b*c*d^2 - a^3*d^3)*f^3*g^3*h^2)*log(F)^3 + 6*((b^2*c^2
*d^2 - 2*a*b*c*d^3 + a^2*d^4)*f^2*g^4*h - (b^2*c^3*d - 2*a*b*c^2*d^2 + a^2*
c*d^3)*f^2*g^3*h^2 + ((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)*f^2*g*h^4 - (b^
2*c^3*d - 2*a*b*c^2*d^2 + a^2*c*d^3)*f^2*h^5)*x^3 + 3*((b^2*c^2*d^2 - 2*a*b
*c*d^3 + a^2*d^4)*f^2*g^2*h^3 - (b^2*c^3*d - 2*a*b*c^2*d^2 + a^2*c*d^3)*f^2
*g*h^4)*x^2 + 3*((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)*f^2*g^3*h^2 - (b^2*c
^3*d - 2*a*b*c^2*d^2 + a^2*c*d^3)*f^2*g^2*h^3)*x)*log(F)^2 + 6*((b*c*d^4 -
a*d^5)*f*g^5 - 2*(b*c^2*d^3 - a*c*d^4)*f*g^4*h + (b*c^3*d^2 - a*c^2*d^3)*f*
g^3*h^2 + ((b*c*d^4 - a*d^5)*f*g^2*h^3 - 2*(b*c^2*d^3 - a*c*d^4)*f*g*h^4 +
(b*c^3*d^2 - a*c^2*d^3)*f*h^5)*x^3 + 3*((b*c*d^4 - a*d^5)*f*g^3*h^2 - 2*(b*
c^2*d^3 - a*c*d^4)*f*g^2*h^3 + (b*c^3*d^2 - a*c^2*d^3)*f*g*h^4)*x^2 + 3*((b
*c*d^4 - a*d^5)*f*g^4*h - 2*(b*c^2*d^3 - a*c*d^4)*f*g^3*h^2 + (b*c^3*d^2 -
a*c^2*d^3)*f*g^2*h^3)*x)*log(F))*F^(((d*e + b*f)*g - (c*e + a*f)*h)/(d*g -
c*h))*Ei(-((b*c - a*d)*f*h*x + (b*c - a*d)*f*g)*log(F)/(c*d*g - c^2*h + (d^
2*g - c*d*h)*x)) + (6*c*d^5*g^5 - 24*c^2*d^4*g^4*h + 38*c^3*d^3*g^3*h^2 - 3
0*c^4*d^2*g^2*h^3 + 12*c^5*d*g*h^4 - 2*c^6*h^5 + 2*(d^6*g^3*h^2 - 3*c*d^5*g
^2*h^3 + 3*c^2*d^4*g*h^4 - c^3*d^3*h^5)*x^3 + 6*(d^6*g^4*h - 3*c*d^5*g^3*h^
2 + 3*c^2*d^4*g^2*h^3 - c^3*d^3*g*h^4)*x^2 + ((b^2*c^3*d - 2*a*b*c^2*d^2 +
a^2*c*d^3)*f^2*g^3*h^2 - (b^2*c^4 - 2*a*b*c^3*d + a^2*c^2*d^2)*f^2*g^2*h^3
+ ((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)*f^2*g*h^4 - (b^2*c^3*d - 2*a*b*c^2
*d^2 + a^2*c*d^3)*f^2*h^5)*x^3 + (2*(b^2*c^2*d^2 - 2*a*b*c*d^3 + a^2*d^4)*f
^2*g^2*h^3 - (b^2*c^3*d - 2*a*b*c^2*d^2 + a^2*c*d^3)*f^2*g*h^4 - (b^2*c^4 -
 2*a*b*c^3*d + a^2*c^2*d^2)*f^2*h^5)*x^2 + ((b^2*c^2*d^2 - 2*a*b*c*d^3 + a^
2*d^4)*f^2*g^3*h^2 + (b^2*c^3*d - 2*a*b*c^2*d^2 + a^2*c*d^3)*f^2*g^2*h^3 -
```

```
2*(b^2*c^4 - 2*a*b*c^3*d + a^2*c^2*d^2)*f^2*g*h^4)*x)*log(F)^2 + 6*(d^6*g^5
 - 3*c*d^5*g^4*h + 3*c^2*d^4*g^3*h^2 - c^3*d^3*g^2*h^3)*x + (6*(b*c^2*d^3 -
 a*c*d^4)*f*g^4*h - 13*(b*c^3*d^2 - a*c^2*d^3)*f*g^3*h^2 + 8*(b*c^4*d - a*c
^3*d^2)*f*g^2*h^3 - (b*c^5 - a*c^4*d)*f*g*h^4 + 5*((b*c*d^4 - a*d^5)*f*g^2*
h^3 - 2*(b*c^2*d^3 - a*c*d^4)*f*g*h^4 + (b*c^3*d^2 - a*c^2*d^3)*f*h^5)*x^3
+ (11*(b*c*d^4 - a*d^5)*f*g^3*h^2 - 18*(b*c^2*d^3 - a*c*d^4)*f*g^2*h^3 + 3*
(b*c^3*d^2 - a*c^2*d^3)*f*g*h^4 + 4*(b*c^4*d - a*c^3*d^2)*f*h^5)*x^2 + (6*(
b*c*d^4 - a*d^5)*f*g^4*h - 2*(b*c^2*d^3 - a*c*d^4)*f*g^3*h^2 - 15*(b*c^3*d^
2 - a*c^2*d^3)*f*g^2*h^3 + 12*(b*c^4*d - a*c^3*d^2)*f*g*h^4 - (b*c^5 - a*c^
4*d)*f*h^5)*x)*log(F))*F^((c*e + a*f + (d*e + b*f)*x)/(d*x + c)))/(d^6*g^9
- 6*c*d^5*g^8*h + 15*c^2*d^4*g^7*h^2 - 20*c^3*d^3*g^6*h^3 + 15*c^4*d^2*g^5*
h^4 - 6*c^5*d*g^4*h^5 + c^6*g^3*h^6 + (d^6*g^6*h^3 - 6*c*d^5*g^5*h^4 + 15*c
^2*d^4*g^4*h^5 - 20*c^3*d^3*g^3*h^6 + 15*c^4*d^2*g^2*h^7 - 6*c^5*d*g*h^8 +
c^6*h^9)*x^3 + 3*(d^6*g^7*h^2 - 6*c*d^5*g^6*h^3 + 15*c^2*d^4*g^5*h^4 - 20*c
^3*d^3*g^4*h^5 + 15*c^4*d^2*g^3*h^6 - 6*c^5*d*g^2*h^7 + c^6*g*h^8)*x^2 + 3*
(d^6*g^8*h - 6*c*d^5*g^7*h^2 + 15*c^2*d^4*g^6*h^3 - 20*c^3*d^3*g^5*h^4 + 15
*c^4*d^2*g^4*h^5 - 6*c^5*d*g^3*h^6 + c^6*g^2*h^7)*x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{e+\frac{(bx+a)f}{dx+c}}}{(hx+g)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(e+f*(b*x+a)/(d*x+c))/(h*x+g)^4,x, algorithm="giac")
```

```
[Out] integrate(F^(e + (b*x + a)*f/(d*x + c))/(h*x + g)^4, x)
```

maple [B] time = 0.30, size = 4671, normalized size = 7.37

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(e+f*(b*x+a)/(d*x+c))/(h*x+g)^4,x)
```

```
[Out] -1/2*ln(F)^3*f^3*d^2*h^2/(c*h-d*g)^6*F^((b*f+d*e)/d)*F^((a*d-b*c)/(d*x+c)/d
*f)/(-1/(c*h-d*g)*a*f*h*ln(F)+1/(c*h-d*g)*b*f*g*ln(F)-1/(c*h-d*g)*c*e*h*ln(
F)+1/(c*h-d*g)*d*e*g*ln(F)+1/(d*x+c)*a*f*ln(F)-1/(d*x+c)*b*c/d*f*ln(F)+b/d*
f*ln(F)+e*ln(F))^2*a^2*b*c+1/2*ln(F)^3*f^3*d*h^2/(c*h-d*g)^6*F^((b*f+d*e)/d
)*F^((a*d-b*c)/(d*x+c)/d*f)/(-1/(c*h-d*g)*a*f*h*ln(F)+1/(c*h-d*g)*b*f*g*ln(
F)-1/(c*h-d*g)*c*e*h*ln(F)+1/(c*h-d*g)*d*e*g*ln(F)+1/(d*x+c)*a*f*ln(F)-1/(d
*x+c)*b*c/d*f*ln(F)+b/d*f*ln(F)+e*ln(F))^2*a*b^2*c^2-1/2*ln(F)^3*f^3*d^2*h^
2/(c*h-d*g)^6*F^((b*f+d*e)/d)*F^((a*d-b*c)/(d*x+c)/d*f)/(-1/(c*h-d*g)*a*f*h
```

```
*ln(F)+1/(c*h-d*g)*b*f*g*ln(F)-1/(c*h-d*g)*c*e*h*ln(F)+1/(c*h-d*g)*d*e*g*ln
(F)+1/(d*x+c)*a*f*ln(F)-1/(d*x+c)*b*c/d*f*ln(F)+b/d*f*ln(F)+e*ln(F))*a^2*b*
c+1/2*ln(F)^3*f^3*d*h^2/(c*h-d*g)^6*F^((b*f+d*e)/d)*F^((a*d-b*c)/(d*x+c)/d*
f)/(-1/(c*h-d*g)*a*f*h*ln(F)+1/(c*h-d*g)*b*f*g*ln(F)-1/(c*h-d*g)*c*e*h*ln(F
)+1/(c*h-d*g)*d*e*g*ln(F)+1/(d*x+c)*a*f*ln(F)-1/(d*x+c)*b*c/d*f*ln(F)+b/d*f
*ln(F)+e*ln(F))*a*b^2*c^2-2*ln(F)^2*f^2*d^2*h/(c*h-d*g)^5*F^((b*f+d*e)/d)*F
^((a*d-b*c)/(d*x+c)/d*f)/(-1/(c*h-d*g)*a*f*h*ln(F)+1/(c*h-d*g)*b*f*g*ln(F)-
1/(c*h-d*g)*c*e*h*ln(F)+1/(c*h-d*g)*d*e*g*ln(F)+1/(d*x+c)*a*f*ln(F)-1/(d*x+
c)*b*c/d*f*ln(F)+b/d*f*ln(F)+e*ln(F))^2*a*b*c-2*ln(F)^2*f^2*d^2*h/(c*h-d*g)
^5*F^((b*f+d*e)/d)*F^((a*d-b*c)/(d*x+c)/d*f)/(-1/(c*h-d*g)*a*f*h*ln(F)+1/(c
*h-d*g)*b*f*g*ln(F)-1/(c*h-d*g)*c*e*h*ln(F)+1/(c*h-d*g)*d*e*g*ln(F)+1/(d*x+
c)*a*f*ln(F)-1/(d*x+c)*b*c/d*f*ln(F)+b/d*f*ln(F)+e*ln(F))*a*b*c-ln(F)^3*f^3
*d^2*h^2/(c*h-d*g)^6*F^((b*f+d*e)/d)*F^((a*d-b*c)/(d*x+c)/d*f)/(-1/(c*h-d*g
)*a*f*h*ln(F)+1/(c*h-d*g)*b*f*g*ln(F)-1/(c*h-d*g)*c*e*h*ln(F)+1/(c*h-d*g)*d
*e*g*ln(F)+1/(d*x+c)*a*f*ln(F)-1/(d*x+c)*b*c/d*f*ln(F)+b/d*f*ln(F)+e*ln(F))
^3*a^2*b*c+ln(F)^3*f^3*d*h^2/(c*h-d*g)^6*F^((b*f+d*e)/d)*F^((a*d-b*c)/(d*x+
c)/d*f)/(-1/(c*h-d*g)*a*f*h*ln(F)+1/(c*h-d*g)*b*f*g*ln(F)-1/(c*h-d*g)*c*e*h
*ln(F)+1/(c*h-d*g)*d*e*g*ln(F)+1/(d*x+c)*a*f*ln(F)-1/(d*x+c)*b*c/d*f*ln(F)+
b/d*f*ln(F)+e*ln(F))^3*a*b^2*c^2+1/3*ln(F)^3*f^3*d^3*h^2/(c*h-d*g)^6*F^((b*
f+d*e)/d)*F^((a*d-b*c)/(d*x+c)/d*f)/(-1/(c*h-d*g)*a*f*h*ln(F)+1/(c*h-d*g)*b
*f*g*ln(F)-1/(c*h-d*g)*c*e*h*ln(F)+1/(c*h-d*g)*d*e*g*ln(F)+1/(d*x+c)*a*f*ln
(F)-1/(d*x+c)*b*c/d*f*ln(F)+b/d*f*ln(F)+e*ln(F))^3*a^3+1/6*ln(F)^3*f^3*d^3*
h^2/(c*h-d*g)^6*F^((b*f+d*e)/d)*F^((a*d-b*c)/(d*x+c)/d*f)/(-1/(c*h-d*g)*a*f
*h*ln(F)+1/(c*h-d*g)*b*f*g*ln(F)-1/(c*h-d*g)*c*e*h*ln(F)+1/(c*h-d*g)*d*e*g*
ln(F)+1/(d*x+c)*a*f*ln(F)-1/(d*x+c)*b*c/d*f*ln(F)+b/d*f*ln(F)+e*ln(F))^2*a^
3+1/6*ln(F)^3*f^3*d^3*h^2/(c*h-d*g)^6*F^((b*f+d*e)/d)*F^((a*d-b*c)/(d*x+c)/
d*f)/(-1/(c*h-d*g)*a*f*h*ln(F)+1/(c*h-d*g)*b*f*g*ln(F)-1/(c*h-d*g)*c*e*h*ln
(F)+1/(c*h-d*g)*d*e*g*ln(F)+1/(d*x+c)*a*f*ln(F)-1/(d*x+c)*b*c/d*f*ln(F)+b/d
*f*ln(F)+e*ln(F))*a^3-ln(F)*f*d^2/(c*h-d*g)^4*F^((b*f+d*e)/d)*F^((a*d-b*c)/
(d*x+c)/d*f)/(-1/(c*h-d*g)*a*f*h*ln(F)+1/(c*h-d*g)*b*f*g*ln(F)-1/(c*h-d*g)*
c*e*h*ln(F)+1/(c*h-d*g)*d*e*g*ln(F)+1/(d*x+c)*a*f*ln(F)-1/(d*x+c)*b*c/d*f*l
n(F)+b/d*f*ln(F)+e*ln(F))*b*c+1/2*ln(F)^3*f^3*d*h^2/(c*h-d*g)^6*F^((a*f*h-b
*f*g+c*e*h-d*e*g)/(c*h-d*g))*Ei(1,-(a*d-b*c)/(d*x+c)/d*f*ln(F)-(b*f+d*e)/d*
ln(F)-(-a*f*h*ln(F)+b*f*g*ln(F)-c*e*h*ln(F)+d*e*g*ln(F))/(c*h-d*g))*a*b^2*c
^2+ln(F)^2*f^2*d*h/(c*h-d*g)^5*F^((b*f+d*e)/d)*F^((a*d-b*c)/(d*x+c)/d*f)/(-
1/(c*h-d*g)*a*f*h*ln(F)+1/(c*h-d*g)*b*f*g*ln(F)-1/(c*h-d*g)*c*e*h*ln(F)+1/(
c*h-d*g)*d*e*g*ln(F)+1/(d*x+c)*a*f*ln(F)-1/(d*x+c)*b*c/d*f*ln(F)+b/d*f*ln(F
)+e*ln(F))^2*b^2*c^2+ln(F)^2*f^2*d*h/(c*h-d*g)^5*F^((b*f+d*e)/d)*F^((a*d-b*
c)/(d*x+c)/d*f)/(-1/(c*h-d*g)*a*f*h*ln(F)+1/(c*h-d*g)*b*f*g*ln(F)-1/(c*h-d*
g)*c*e*h*ln(F)+1/(c*h-d*g)*d*e*g*ln(F)+1/(d*x+c)*a*f*ln(F)-1/(d*x+c)*b*c/d*
f*ln(F)+b/d*f*ln(F)+e*ln(F))*b^2*c^2-2*ln(F)^2*f^2*d^2*h/(c*h-d*g)^5*F^((a*
f*h-b*f*g+c*e*h-d*e*g)/(c*h-d*g))*Ei(1,-(a*d-b*c)/(d*x+c)/d*f*ln(F)-(b*f+d*
e)/d*ln(F)-(-a*f*h*ln(F)+b*f*g*ln(F)-c*e*h*ln(F)+d*e*g*ln(F))/(c*h-d*g))*a*
b*c-1/2*ln(F)^3*f^3*d^2*h^2/(c*h-d*g)^6*F^((a*f*h-b*f*g+c*e*h-d*e*g)/(c*h-d
*g))*Ei(1,-(a*d-b*c)/(d*x+c)/d*f*ln(F)-(b*f+d*e)/d*ln(F)-(-a*f*h*ln(F)+b*f*
```

```
g*ln(F)-c*e*h*ln(F)+d*e*g*ln(F))/(c*h-d*g))*a^2*b*c+ln(F)^2*f^2*d^3*h/(c*h-
d*g)^5*F^((a*f*h-b*f*g+c*e*h-d*e*g)/(c*h-d*g))*Ei(1,-(a*d-b*c)/(d*x+c)/d*f*
ln(F)-(b*f+d*e)/d*ln(F)-(-a*f*h*ln(F)+b*f*g*ln(F)-c*e*h*ln(F)+d*e*g*ln(F))/
(c*h-d*g))*a^2+1/6*ln(F)^3*f^3*d^3*h^2/(c*h-d*g)^6*F^((a*f*h-b*f*g+c*e*h-d*
e*g)/(c*h-d*g))*Ei(1,-(a*d-b*c)/(d*x+c)/d*f*ln(F)-(b*f+d*e)/d*ln(F)-(-a*f*h
*ln(F)+b*f*g*ln(F)-c*e*h*ln(F)+d*e*g*ln(F))/(c*h-d*g))*a^3+ln(F)*f*d^3/(c*h
-d*g)^4*F^((b*f+d*e)/d)*F^((a*d-b*c)/(d*x+c)/d*f)/(-1/(c*h-d*g)*a*f*h*ln(F)
+1/(c*h-d*g)*b*f*g*ln(F)-1/(c*h-d*g)*c*e*h*ln(F)+1/(c*h-d*g)*d*e*g*ln(F)+1/
(d*x+c)*a*f*ln(F)-1/(d*x+c)*b*c/d*f*ln(F)+b/d*f*ln(F)+e*ln(F))*a-ln(F)*f*d^
2/(c*h-d*g)^4*F^((a*f*h-b*f*g+c*e*h-d*e*g)/(c*h-d*g))*Ei(1,-(a*d-b*c)/(d*x+
c)/d*f*ln(F)-(b*f+d*e)/d*ln(F)-(-a*f*h*ln(F)+b*f*g*ln(F)-c*e*h*ln(F)+d*e*g*
ln(F))/(c*h-d*g))*b*c-1/6*ln(F)^3*f^3*h^2/(c*h-d*g)^6*F^((a*f*h-b*f*g+c*e*h
-d*e*g)/(c*h-d*g))*Ei(1,-(a*d-b*c)/(d*x+c)/d*f*ln(F)-(b*f+d*e)/d*ln(F)-(-a*
f*h*ln(F)+b*f*g*ln(F)-c*e*h*ln(F)+d*e*g*ln(F))/(c*h-d*g))*b^3*c^3+ln(F)*f*d
^3/(c*h-d*g)^4*F^((a*f*h-b*f*g+c*e*h-d*e*g)/(c*h-d*g))*Ei(1,-(a*d-b*c)/(d*x
+c)/d*f*ln(F)-(b*f+d*e)/d*ln(F)-(-a*f*h*ln(F)+b*f*g*ln(F)-c*e*h*ln(F)+d*e*g
*ln(F))/(c*h-d*g))*a+ln(F)^2*f^2*d^3*h/(c*h-d*g)^5*F^((b*f+d*e)/d)*F^((a*d-
b*c)/(d*x+c)/d*f)/(-1/(c*h-d*g)*a*f*h*ln(F)+1/(c*h-d*g)*b*f*g*ln(F)-1/(c*h-
d*g)*c*e*h*ln(F)+1/(c*h-d*g)*d*e*g*ln(F)+1/(d*x+c)*a*f*ln(F)-1/(d*x+c)*b*c/
d*f*ln(F)+b/d*f*ln(F)+e*ln(F))^2*a^2+ln(F)^2*f^2*d^3*h/(c*h-d*g)^5*F^((b*f+
d*e)/d)*F^((a*d-b*c)/(d*x+c)/d*f)/(-1/(c*h-d*g)*a*f*h*ln(F)+1/(c*h-d*g)*b*f
*g*ln(F)-1/(c*h-d*g)*c*e*h*ln(F)+1/(c*h-d*g)*d*e*g*ln(F)+1/(d*x+c)*a*f*ln(F
)-1/(d*x+c)*b*c/d*f*ln(F)+b/d*f*ln(F)+e*ln(F))*a^2+ln(F)^2*f^2*d*h/(c*h-d*g
)^5*F^((a*f*h-b*f*g+c*e*h-d*e*g)/(c*h-d*g))*Ei(1,-(a*d-b*c)/(d*x+c)/d*f*ln(
F)-(b*f+d*e)/d*ln(F)-(-a*f*h*ln(F)+b*f*g*ln(F)-c*e*h*ln(F)+d*e*g*ln(F))/(c*
h-d*g))*b^2*c^2-1/3*ln(F)^3*f^3*h^2/(c*h-d*g)^6*F^((b*f+d*e)/d)*F^((a*d-b*c
)/(d*x+c)/d*f)/(-1/(c*h-d*g)*a*f*h*ln(F)+1/(c*h-d*g)*b*f*g*ln(F)-1/(c*h-d*g
)*c*e*h*ln(F)+1/(c*h-d*g)*d*e*g*ln(F)+1/(d*x+c)*a*f*ln(F)-1/(d*x+c)*b*c/d*f
*ln(F)+b/d*f*ln(F)+e*ln(F))^3*b^3*c^3-1/6*ln(F)^3*f^3*h^2/(c*h-d*g)^6*F^((b
*f+d*e)/d)*F^((a*d-b*c)/(d*x+c)/d*f)/(-1/(c*h-d*g)*a*f*h*ln(F)+1/(c*h-d*g)*
b*f*g*ln(F)-1/(c*h-d*g)*c*e*h*ln(F)+1/(c*h-d*g)*d*e*g*ln(F)+1/(d*x+c)*a*f*l
n(F)-1/(d*x+c)*b*c/d*f*ln(F)+b/d*f*ln(F)+e*ln(F))^2*b^3*c^3-1/6*ln(F)^3*f^3
*h^2/(c*h-d*g)^6*F^((b*f+d*e)/d)*F^((a*d-b*c)/(d*x+c)/d*f)/(-1/(c*h-d*g)*a*
f*h*ln(F)+1/(c*h-d*g)*b*f*g*ln(F)-1/(c*h-d*g)*c*e*h*ln(F)+1/(c*h-d*g)*d*e*g
*ln(F)+1/(d*x+c)*a*f*ln(F)-1/(d*x+c)*b*c/d*f*ln(F)+b/d*f*ln(F)+e*ln(F))*b^3
*c^3
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{e+\frac{(bx+a)f}{dx+c}}}{\left(hx+g\right)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(e+f*(b*x+a)/(d*x+c))/(h*x+g)^4,x, algorithm="maxima")
```

```
[Out] integrate(F^(e + (b*x + a)*f/(d*x + c))/(h*x + g)^4, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{F^{e+\frac{f(a+bx)}{c+dx}}}{(g+hx)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(e + (f*(a + b*x))/(c + d*x))/(g + h*x)^4,x)
[Out] int(F^(e + (f*(a + b*x))/(c + d*x))/(g + h*x)^4, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(e+f*(b*x+a)/(d*x+c))/(h*x+g)**4,x)
[Out] Timed out
```

3.426 $\int f^{a+bx+cx^2}x^3\,dx$

Optimal. Leaf size=217

$$\frac{3\sqrt{\pi}\,bf^{a-\frac{b^2}{4c}}\operatorname{erfi}\left(\frac{\sqrt{\log(f)}\,(b+2cx)}{2\sqrt{c}}\right)}{8c^{5/2}\log^{\frac{3}{2}}(f)}+\frac{b^2f^{a+bx+cx^2}}{8c^3\log(f)}-\frac{\sqrt{\pi}\,b^3f^{a-\frac{b^2}{4c}}\operatorname{erfi}\left(\frac{\sqrt{\log(f)}\,(b+2cx)}{2\sqrt{c}}\right)}{16c^{7/2}\sqrt{\log(f)}}-\frac{f^{a+bx+cx^2}}{2c^2\log^2(f)}-\frac{bxf^{a+bx+cx^2}}{4c^2\log(f)}+\frac{x^2f^{a+bx+cx^2}}{2c\log(f)}$$

```
[Out] -1/2*f^(c*x^2+b*x+a)/c^2/ln(f)^2+1/8*b^2*f^(c*x^2+b*x+a)/c^3/ln(f)-1/4*b*f^
(c*x^2+b*x+a)*x/c^2/ln(f)+1/2*f^(c*x^2+b*x+a)*x^2/c/ln(f)+3/8*b*f^(a-1/4/c*
b^2)*erfi(1/2*(2*c*x+b)*ln(f)^(1/2)/c^(1/2))*Pi^(1/2)/c^(5/2)/ln(f)^(3/2)-1
/16*b^3*f^(a-1/4/c*b^2)*erfi(1/2*(2*c*x+b)*ln(f)^(1/2)/c^(1/2))*Pi^(1/2)/c^
(7/2)/ln(f)^(1/2)
```

Rubi [A] time = 0.23, antiderivative size = 217, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 4, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {2241, 2240, 2234, 2204}

$$\frac{3\sqrt{\pi}\,bf^{a-\frac{b^2}{4c}}\operatorname{Erfi}\left(\frac{\sqrt{\log(f)}\,(b+2cx)}{2\sqrt{c}}\right)}{8c^{5/2}\log^{\frac{3}{2}}(f)}-\frac{\sqrt{\pi}\,b^3f^{a-\frac{b^2}{4c}}\operatorname{Erfi}\left(\frac{\sqrt{\log(f)}\,(b+2cx)}{2\sqrt{c}}\right)}{16c^{7/2}\sqrt{\log(f)}}+\frac{b^2f^{a+bx+cx^2}}{8c^3\log(f)}-\frac{f^{a+bx+cx^2}}{2c^2\log^2(f)}-\frac{bxf^{a+bx+cx^2}}{4c^2\log(f)}+\frac{x^2f^{a+bx+cx^2}}{2c\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x + c*x^2)*x^3,x]
```

```
[Out] -f^(a + b*x + c*x^2)/(2*c^2*Log[f]^2) + (3*b*f^(a - b^2/(4*c))*Sqrt[Pi]*Erf
i[((b + 2*c*x)*Sqrt[Log[f]])/(2*Sqrt[c])])/(8*c^(5/2)*Log[f]^(3/2)) + (b^2*
f^(a + b*x + c*x^2))/(8*c^3*Log[f]) - (b*f^(a + b*x + c*x^2)*x)/(4*c^2*Log[
f]) + (f^(a + b*x + c*x^2)*x^2)/(2*c*Log[f]) - (b^3*f^(a - b^2/(4*c))*Sqrt[
Pi]*Erfi[((b + 2*c*x)*Sqrt[Log[f]])/(2*Sqrt[c])])/(16*c^(7/2)*Sqrt[Log[f]])
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2234

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_)), x_Symbol
] :> Simp[(e*F^(a + b*x + c*x^2))/(2*c*Log[F]), x] - Dist[(b*e - 2*c*d)/(2*
c), Int[F^(a + b*x + c*x^2), x], x] /; FreeQ[{F, a, b, c, d, e}, x] && NeQ[
b*e - 2*c*d, 0]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_))^(m_), x_S
ymbol] :> Simp[(e*(d + e*x)^(m - 1)*F^(a + b*x + c*x^2))/(2*c*Log[F]), x] +
 (-Dist[(b*e - 2*c*d)/(2*c), Int[(d + e*x)^(m - 1)*F^(a + b*x + c*x^2), x],
 x] - Dist[((m - 1)*e^2)/(2*c*Log[F]), Int[(d + e*x)^(m - 2)*F^(a + b*x + c
*x^2), x], x]) /; FreeQ[{F, a, b, c, d, e}, x] && NeQ[b*e - 2*c*d, 0] && Gt
Q[m, 1]
```

Rubi steps

$$\int f^{a+bx+cx^2}x^3\,dx = \frac{f^{a+bx+cx^2}x^2}{2c\log(f)} - \frac{b\int f^{a+bx+cx^2}x^2\,dx}{2c} - \frac{\int f^{a+bx+cx^2}x\,dx}{c\log(f)}$$

$$= -\frac{f^{a+bx+cx^2}}{2c^2\log^2(f)} - \frac{bf^{a+bx+cx^2}x}{4c^2\log(f)} + \frac{f^{a+bx+cx^2}x^2}{2c\log(f)} + \frac{b^2\int f^{a+bx+cx^2}x\,dx}{4c^2} + \frac{b\int f^{a+bx+cx^2}\,dx}{4c^2\log(f)} + \frac{b\int f^{a+}\cdots}{2c^2\cdots}$$

$$= -\frac{f^{a+bx+cx^2}}{2c^2\log^2(f)} + \frac{b^2f^{a+bx+cx^2}}{8c^3\log(f)} - \frac{bf^{a+bx+cx^2}x}{4c^2\log(f)} + \frac{f^{a+bx+cx^2}x^2}{2c\log(f)} - \frac{b^3\int f^{a+bx+cx^2}\,dx}{8c^3} + \frac{\left(bf^{a-\frac{b^2}{4c}}\right)\int f\cdots}{4c^2\log\cdots}$$

$$= -\frac{f^{a+bx+cx^2}}{2c^2\log^2(f)} + \frac{3bf^{a-\frac{b^2}{4c}}\sqrt{\pi}\operatorname{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)}{8c^{5/2}\log^{\frac{3}{2}}(f)} + \frac{b^2f^{a+bx+cx^2}}{8c^3\log(f)} - \frac{bf^{a+bx+cx^2}x}{4c^2\log(f)} + \frac{f^{a+bx+cx^2}x^2}{2c\log(f)} - \cdots$$

$$= -\frac{f^{a+bx+cx^2}}{2c^2\log^2(f)} + \frac{3bf^{a-\frac{b^2}{4c}}\sqrt{\pi}\operatorname{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)}{8c^{5/2}\log^{\frac{3}{2}}(f)} + \frac{b^2f^{a+bx+cx^2}}{8c^3\log(f)} - \frac{bf^{a+bx+cx^2}x}{4c^2\log(f)} + \frac{f^{a+bx+cx^2}x^2}{2c\log(f)} - \cdots$$

Mathematica [A] time = 0.18, size = 122, normalized size = 0.56

$$\frac{f^{a-\frac{b^2}{4c}}\left(2\sqrt{c}\,f^{\frac{(b+2cx)^2}{4c}}\left(\log(f)\left(b^2-2bcx+4c^2x^2\right)-4c\right)+\sqrt{\pi}\,b\sqrt{\log(f)}\left(6c-b^2\log(f)\right)\operatorname{erfi}\left(\frac{\sqrt{\log(f)}\,(b+2cx)}{2\sqrt{c}}\right)\right)}{16c^{7/2}\log^2(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x + c*x^2)*x^3,x]
```

```
[Out] (f^(a - b^2/(4*c))*(b*Sqrt[Pi]*Erfi[((b + 2*c*x)*Sqrt[Log[f]])/(2*Sqrt[c])]
*Sqrt[Log[f]]*(6*c - b^2*Log[f]) + 2*Sqrt[c]*f^((b + 2*c*x)^2/(4*c))*(-4*c
+ (b^2 - 2*b*c*x + 4*c^2*x^2)*Log[f])))/(16*c^(7/2)*Log[f]^2)
```

fricas [A] time = 0.41, size = 114, normalized size = 0.53

$$-\frac{2\left(4c^2-\left(4c^3x^2-2bc^2x+b^2c\right)\log(f)\right)f^{cx^2+bx+a}-\frac{\sqrt{\pi}\left(b^3\log(f)-6bc\right)\sqrt{-c\log(f)}\operatorname{erf}\left(\frac{(2cx+b)\sqrt{-c\log(f)}}{2c}\right)}{f^{\frac{b^2-4ac}{4c}}}}{16c^4\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*x^3,x, algorithm="fricas")
```

```
[Out] -1/16*(2*(4*c^2 - (4*c^3*x^2 - 2*b*c^2*x + b^2*c)*log(f))*f^(c*x^2 + b*x +
a) - sqrt(pi)*(b^3*log(f) - 6*b*c)*sqrt(-c*log(f))*erf(1/2*(2*c*x + b)*sqrt
(-c*log(f))/c)/f^(1/4*(b^2 - 4*a*c)/c))/(c^4*log(f)^2)
```

giac [A] time = 0.39, size = 137, normalized size = 0.63

$$\frac{\frac{\sqrt{\pi}\left(b^3\log(f)-6bc\right)\operatorname{erf}\left(-\frac{1}{2}\sqrt{-c\log(f)}\left(2x+\frac{b}{c}\right)\right)e^{\left(-\frac{b^2\log(f)-4ac\log(f)}{4c}\right)}}{\sqrt{-c\log(f)}\log(f)}+\frac{2\left(c^2\left(2x+\frac{b}{c}\right)^2\log(f)-3bc\left(2x+\frac{b}{c}\right)\log(f)+3b^2\log(f)-4c\right)e^{(cx^2\log(f)+bx\,\cdots}}{\log(f)^2}}{16c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*x^3,x, algorithm="giac")
```

```
[Out] 1/16*(sqrt(pi)*(b^3*log(f) - 6*b*c)*erf(-1/2*sqrt(-c*log(f))*(2*x + b/c))*e
^(-1/4*(b^2*log(f) - 4*a*c*log(f))/c)/(sqrt(-c*log(f))*log(f)) + 2*(c^2*(2*
x + b/c)^2*log(f) - 3*b*c*(2*x + b/c)*log(f) + 3*b^2*log(f) - 4*c)*e^(c*x^2
*log(f) + b*x*log(f) + a*log(f))/log(f)^2)/c^3
```

maple [A] time = 0.11, size = 218, normalized size = 1.00

$$\frac{\sqrt{\pi}\,b^3f^af^{-\frac{b^2}{4c}}\operatorname{erf}\left(\frac{b\ln(f)}{2\sqrt{-c\ln(f)}}-\sqrt{-c\ln(f)}\,x\right)}{16\sqrt{-c\ln(f)}\,c^3}+\frac{x^2f^af^{bx}f^{cx^2}}{2c\ln(f)}-\frac{bxf^af^{bx}f^{cx^2}}{4c^2\ln(f)}+\frac{b^2f^af^{bx}f^{cx^2}}{8c^3\ln(f)}-\frac{3\sqrt{\pi}\,bf^af^{-\frac{b^2}{4c}}\operatorname{erf}\left(\frac{b\,\cdots}{2\sqrt{\cdots}}\cdots\right)}{8\sqrt{-c\ln(\cdots}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*x^2+b*x+a)*x^3,x)
```

```
[Out] 1/2/c/ln(f)*x^2*f^(c*x^2)*f^(b*x)*f^a-1/4*b/c^2/ln(f)*x*f^(c*x^2)*f^(b*x)*f
^a+1/8*b^2/c^3/ln(f)*f^(c*x^2)*f^(b*x)*f^a+1/16*b^3/c^3*Pi^(1/2)*f^a*f^(-1/
4*b^2/c)/(-c*ln(f))^(1/2)*erf(-(-c*ln(f))^(1/2)*x+1/2*b*ln(f)/(-c*ln(f))^(1
/2))-3/8*b/c^2/ln(f)*Pi^(1/2)*f^a*f^(-1/4*b^2/c)/(-c*ln(f))^(1/2)*erf(-(-c*
ln(f))^(1/2)*x+1/2*b*ln(f)/(-c*ln(f))^(1/2))-1/2/c^2/ln(f)^2*f^(c*x^2)*f^(b
*x)*f^a
```

maxima [A] time = 2.28, size = 201, normalized size = 0.93

$$-\frac{\left(\frac{\sqrt{\pi}(2cx+b)b^3\left(\operatorname{erf}\left(\frac{1}{2}\sqrt{-\frac{(2cx+b)^2\log(f)}{c}}\right)-1\right)\log(f)^4}{\sqrt{-\frac{(2cx+b)^2\log(f)}{c}}\left(c\log(f)\right)^{\frac{7}{2}}}-\frac{12(2cx+b)^3b\Gamma\left(\frac{3}{2},-\frac{(2cx+b)^2\log(f)}{4c}\right)\log(f)^4}{\left(-\frac{(2cx+b)^2\log(f)}{c}\right)^{\frac{3}{2}}\left(c\log(f)\right)^{\frac{7}{2}}}-\frac{6b^2cf^{\frac{(2cx+b)^2}{4c}}\log(f)^3}{\left(c\log(f)\right)^{\frac{7}{2}}}+\frac{8c^2\Gamma\left(2,-\frac{(2cx+b)^2\log(f)}{4c}\right)\log(f)^2}{\left(c\log(f)\right)^{\frac{7}{2}}}\right)f^{a-\frac{b^2}{4c}}}{16\sqrt{c\log(f)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*x^3,x, algorithm="maxima")
```

```
[Out] -1/16*(sqrt(pi)*(2*c*x + b)*b^3*(erf(1/2*sqrt(-(2*c*x + b)^2*log(f)/c)) - 1
)*log(f)^4/(sqrt(-(2*c*x + b)^2*log(f)/c)*(c*log(f))^(7/2)) - 12*(2*c*x + b
)^3*b*gamma(3/2, -1/4*(2*c*x + b)^2*log(f)/c)*log(f)^4/((-(2*c*x + b)^2*log
(f)/c)^(3/2)*(c*log(f))^(7/2)) - 6*b^2*c*f^(1/4*(2*c*x + b)^2/c)*log(f)^3/(
c*log(f))^(7/2) + 8*c^2*gamma(2, -1/4*(2*c*x + b)^2*log(f)/c)*log(f)^2/(c*l
og(f))^(7/2))*f^(a - 1/4*b^2/c)/sqrt(c*log(f))
```

mupad [B] time = 3.87, size = 153, normalized size = 0.71

$$\frac{f^a\,f^{c\,x^2}\,f^{b\,x}\,x^2}{2\,c\,\ln(f)}-f^a\,f^{c\,x^2}\,f^{b\,x}\,\left(\frac{1}{2\,c^2\ln(f)^2}-\frac{b^2}{8\,c^3\,\ln(f)}\right)+\frac{f^{a-\frac{b^2}{4c}}\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{\frac{b\,\ln(f)}{2}+c\,x\,\ln(f)}{\sqrt{c\,\ln(f)}}\right)\,\left(\frac{3\,b\,c}{8}-\frac{b^3\,\ln(f)}{16}\right)}{c^3\,\ln(f)\,\sqrt{c\,\ln(f)}}-\frac{b\,f^a\,f^{c\,x^2}\,f^{b\,x}\,x}{4\,c^2\,\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x + c*x^2)*x^3,x)
```

```
[Out] (f^a*f^(c*x^2)*f^(b*x)*x^2)/(2*c*log(f)) - f^a*f^(c*x^2)*f^(b*x)*(1/(2*c^2*
log(f)^2) - b^2/(8*c^3*log(f))) + (f^(a - b^2/(4*c))*pi^(1/2)*erfi(((b*log(
f))/2 + c*x*log(f))/(c*log(f))^(1/2))*((3*b*c)/8 - (b^3*log(f))/16))/(c^3*l
og(f)*(c*log(f))^(1/2)) - (b*f^a*f^(c*x^2)*f^(b*x)*x)/(4*c^2*log(f))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+bx+cx^2}x^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*x**2+b*x+a)*x**3,x)
```

```
[Out] Integral(f**(a + b*x + c*x**2)*x**3, x)
```

3.427 $\int f^{a+bx+cx^2} x^2 \, dx$

Optimal. Leaf size=164

$$-\frac{\sqrt{\pi}\, f^{a-\frac{b^2}{4c}} \operatorname{erfi}\left(\frac{\sqrt{\log(f)}\,(b+2cx)}{2\sqrt{c}}\right)}{4c^{3/2}\log^{\frac{3}{2}}(f)}+\frac{\sqrt{\pi}\, b^2 f^{a-\frac{b^2}{4c}} \operatorname{erfi}\left(\frac{\sqrt{\log(f)}\,(b+2cx)}{2\sqrt{c}}\right)}{8c^{5/2}\sqrt{\log(f)}}-\frac{b f^{a+bx+cx^2}}{4c^2\log(f)}+\frac{x f^{a+bx+cx^2}}{2c\log(f)}$$

```
[Out] -1/4*b*f^(c*x^2+b*x+a)/c^2/ln(f)+1/2*f^(c*x^2+b*x+a)*x/c/ln(f)-1/4*f^(a-1/4
/c*b^2)*erfi(1/2*(2*c*x+b)*ln(f)^(1/2)/c^(1/2))*Pi^(1/2)/c^(3/2)/ln(f)^(3/2
)+1/8*b^2*f^(a-1/4/c*b^2)*erfi(1/2*(2*c*x+b)*ln(f)^(1/2)/c^(1/2))*Pi^(1/2)/
c^(5/2)/ln(f)^(1/2)
```

Rubi [A] time = 0.09, antiderivative size = 164, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {2241, 2240, 2234, 2204}

$$-\frac{\sqrt{\pi}\, f^{a-\frac{b^2}{4c}} \operatorname{Erfi}\left(\frac{\sqrt{\log(f)}\,(b+2cx)}{2\sqrt{c}}\right)}{4c^{3/2}\log^{\frac{3}{2}}(f)}+\frac{\sqrt{\pi}\, b^2 f^{a-\frac{b^2}{4c}} \operatorname{Erfi}\left(\frac{\sqrt{\log(f)}\,(b+2cx)}{2\sqrt{c}}\right)}{8c^{5/2}\sqrt{\log(f)}}-\frac{b f^{a+bx+cx^2}}{4c^2\log(f)}+\frac{x f^{a+bx+cx^2}}{2c\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x + c*x^2)*x^2,x]
```

```
[Out] -(f^(a - b^2/(4*c))*Sqrt[Pi]*Erfi[((b + 2*c*x)*Sqrt[Log[f]])/(2*Sqrt[c])])/
(4*c^(3/2)*Log[f]^(3/2)) - (b*f^(a + b*x + c*x^2))/(4*c^2*Log[f]) + (f^(a +
 b*x + c*x^2)*x)/(2*c*Log[f]) + (b^2*f^(a - b^2/(4*c))*Sqrt[Pi]*Erfi[((b +
2*c*x)*Sqrt[Log[f]])/(2*Sqrt[c])])/(8*c^(5/2)*Sqrt[Log[f]])
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2234

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_)), x_Symbol
] :> Simp[(e*F^(a + b*x + c*x^2))/(2*c*Log[F]), x] - Dist[(b*e - 2*c*d)/(2*
```

```
c), Int[F^(a + b*x + c*x^2), x], x] /; FreeQ[{F, a, b, c, d, e}, x] && NeQ[
b*e - 2*c*d, 0]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_))^(m_), x_S
ymbol] :> Simp[(e*(d + e*x)^(m - 1)*F^(a + b*x + c*x^2))/(2*c*Log[F]), x] +
 (-Dist[(b*e - 2*c*d)/(2*c), Int[(d + e*x)^(m - 1)*F^(a + b*x + c*x^2), x],
 x] - Dist[((m - 1)*e^2)/(2*c*Log[F]), Int[(d + e*x)^(m - 2)*F^(a + b*x + c
*x^2), x], x]) /; FreeQ[{F, a, b, c, d, e}, x] && NeQ[b*e - 2*c*d, 0] && Gt
Q[m, 1]
```

Rubi steps

$$\begin{aligned}
\int f^{a+bx+cx^2}x^2\,dx &= \frac{f^{a+bx+cx^2}x}{2c\log(f)}-\frac{b\int f^{a+bx+cx^2}x\,dx}{2c}-\frac{\int f^{a+bx+cx^2}\,dx}{2c\log(f)}\\
&= -\frac{bf^{a+bx+cx^2}}{4c^2\log(f)}+\frac{f^{a+bx+cx^2}x}{2c\log(f)}+\frac{b^2\int f^{a+bx+cx^2}\,dx}{4c^2}-\frac{f^{a-\frac{b^2}{4c}}\int f^{\frac{(b+2cx)^2}{4c}}\,dx}{2c\log(f)}\\
&= -\frac{f^{a-\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)}{4c^{3/2}\log^{\frac{3}{2}}(f)}-\frac{bf^{a+bx+cx^2}}{4c^2\log(f)}+\frac{f^{a+bx+cx^2}x}{2c\log(f)}+\frac{\left(b^2f^{a-\frac{b^2}{4c}}\right)\int f^{\frac{(b+2cx)^2}{4c}}\,dx}{4c^2}\\
&= -\frac{f^{a-\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)}{4c^{3/2}\log^{\frac{3}{2}}(f)}-\frac{bf^{a+bx+cx^2}}{4c^2\log(f)}+\frac{f^{a+bx+cx^2}x}{2c\log(f)}+\frac{b^2f^{a-\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)}{8c^{5/2}\sqrt{\log(f)}}
\end{aligned}$$

Mathematica [A] time = 0.12, size = 104, normalized size = 0.63

$$\frac{f^{a-\frac{b^2}{4c}}\left(\sqrt{\pi}\left(b^2\log(f)-2c\right)\mathrm{erfi}\left(\frac{\sqrt{\log(f)}(b+2cx)}{2\sqrt{c}}\right)-2\sqrt{c}\sqrt{\log(f)}(b-2cx)f^{\frac{(b+2cx)^2}{4c}}\right)}{8c^{5/2}\log^{\frac{3}{2}}(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x + c*x^2)*x^2,x]
```

```
[Out] (f^(a - b^2/(4*c))*(-2*Sqrt[c]*f^((b + 2*c*x)^2/(4*c))*(b - 2*c*x)*Sqrt[Log
[f]] + Sqrt[Pi]*Erfi[((b + 2*c*x)*Sqrt[Log[f]])/(2*Sqrt[c])]*(-2*c + b^2*Lo
g[f])))/(8*c^(5/2)*Log[f]^(3/2))
```

fricas [A] time = 0.42, size = 95, normalized size = 0.58

$$\frac{2\left(2\,c^{2}x-bc\right)f^{cx^{2}+bx+a}\log(f)-\frac{\sqrt{\pi}\left(b^{2}\log(f)-2\,c\right)\sqrt{-c\log(f)}\,\operatorname{erf}\left(\frac{(2\,cx+b)\sqrt{-c\log(f)}}{2\,c}\right)}{f^{\frac{b^{2}-4\,ac}{4\,c}}}}{8\,c^{3}\log(f)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*x^2,x, algorithm="fricas")
```

```
[Out] 1/8*(2*(2*c^2*x - b*c)*f^(c*x^2 + b*x + a)*log(f) - sqrt(pi)*(b^2*log(f) -
2*c)*sqrt(-c*log(f))*erf(1/2*(2*c*x + b)*sqrt(-c*log(f))/c)/f^(1/4*(b^2 - 4
*a*c)/c))/(c^3*log(f)^2)
```

giac [A] time = 0.42, size = 108, normalized size = 0.66

$$-\frac{\frac{\sqrt{\pi}\left(b^{2}\log(f)-2\,c\right)\operatorname{erf}\left(-\frac{1}{2}\,\sqrt{-c\log(f)}\left(2\,x+\frac{b}{c}\right)\right)e^{\left(-\frac{b^{2}\log(f)-4\,ac\log(f)}{4\,c}\right)}}{\sqrt{-c\log(f)}\,\log(f)}-\frac{2\left(c\left(2\,x+\frac{b}{c}\right)-2\,b\right)e^{\left(cx^{2}\log(f)+bx\log(f)+a\log(f)\right)}}{\log(f)}}{8\,c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*x^2,x, algorithm="giac")
```

```
[Out] -1/8*(sqrt(pi)*(b^2*log(f) - 2*c)*erf(-1/2*sqrt(-c*log(f))*(2*x + b/c))*e^(
-1/4*(b^2*log(f) - 4*a*c*log(f))/c)/(sqrt(-c*log(f))*log(f)) - 2*(c*(2*x +
b/c) - 2*b)*e^(c*x^2*log(f) + b*x*log(f) + a*log(f))/log(f))/c^2
```

maple [A] time = 0.06, size = 163, normalized size = 0.99

$$-\frac{\sqrt{\pi}\,b^{2}f^{a}f^{-\frac{b^{2}}{4c}}\operatorname{erf}\left(\frac{b\ln(f)}{2\sqrt{-c\ln(f)}}-\sqrt{-c\ln(f)}\,x\right)}{8\sqrt{-c\ln(f)}\,c^{2}}+\frac{x\,f^{a}f^{bx}f^{c\,x^{2}}}{2c\ln(f)}-\frac{b\,f^{a}f^{bx}f^{c\,x^{2}}}{4c^{2}\ln(f)}+\frac{\sqrt{\pi}\,f^{a}f^{-\frac{b^{2}}{4c}}\operatorname{erf}\left(\frac{b\ln(f)}{2\sqrt{-c\ln(f)}}-\sqrt{-c\ln(f)}\right)}{4\sqrt{-c\ln(f)}\,c\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*x^2+b*x+a)*x^2,x)
```

```
[Out] 1/2/c/ln(f)*x*f^(c*x^2)*f^(b*x)*f^a-1/4*b/c^2/ln(f)*f^(c*x^2)*f^(b*x)*f^a-1
/8*b^2/c^2*Pi^(1/2)*f^a*f^(-1/4*b^2/c)/(-c*ln(f))^(1/2)*erf(1/2/(-c*ln(f))^
(1/2)*b*ln(f)-(-c*ln(f))^(1/2)*x)+1/4/c/ln(f)*Pi^(1/2)*f^a*f^(-1/4*b^2/c)/(
-c*ln(f))^(1/2)*erf(1/2/(-c*ln(f))^(1/2)*b*ln(f)-(-c*ln(f))^(1/2)*x)
```

maxima [A] time = 2.08, size = 166, normalized size = 1.01

$$\frac{\left(\frac{\sqrt{\pi}\,(2\,cx+b)b^2\left(\operatorname{erf}\left(\frac{1}{2}\sqrt{-\frac{(2\,cx+b)^2\log(f)}{c}}\right)-1\right)\log(f)^3}{\sqrt{-\frac{(2\,cx+b)^2\log(f)}{c}}\,(c\log(f))^{\frac{5}{2}}}-\frac{4\,(2\,cx+b)^3\Gamma\left(\frac{3}{2},-\frac{(2\,cx+b)^2\log(f)}{4\,c}\right)\log(f)^3}{\left(-\frac{(2\,cx+b)^2\log(f)}{c}\right)^{\frac{3}{2}}(c\log(f))^{\frac{5}{2}}}-\frac{4\,bcf^{\frac{(2\,cx+b)^2}{4\,c}}\log(f)^2}{(c\log(f))^{\frac{5}{2}}}\right)f^{a-\frac{b^2}{4\,c}}}{8\,\sqrt{c\log(f)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*x^2,x, algorithm="maxima")
```

```
[Out] 1/8*(sqrt(pi)*(2*c*x + b)*b^2*(erf(1/2*sqrt(-(2*c*x + b)^2*log(f)/c)) - 1)*
log(f)^3/(sqrt(-(2*c*x + b)^2*log(f)/c)*(c*log(f))^(5/2)) - 4*(2*c*x + b)^3
*gamma(3/2, -1/4*(2*c*x + b)^2*log(f)/c)*log(f)^3/((-(2*c*x + b)^2*log(f)/c
)^(3/2)*(c*log(f))^(5/2)) - 4*b*c*f^(1/4*(2*c*x + b)^2/c)*log(f)^2/(c*log(f
))^(5/2))*f^(a - 1/4*b^2/c)/sqrt(c*log(f))
```

mupad [B] time = 3.60, size = 111, normalized size = 0.68

$$\frac{f^a\,f^{c\,x^2}\,f^{b\,x}\,x}{2\,c\,\ln(f)}-\frac{b\,f^a\,f^{c\,x^2}\,f^{b\,x}}{4\,c^2\,\ln(f)}-\frac{f^{a-\frac{b^2}{4\,c}}\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{\frac{b\,\ln(f)}{2}+c\,x\,\ln(f)}{\sqrt{c\,\ln(f)}}\right)\left(\frac{c}{4}-\frac{b^2\,\ln(f)}{8}\right)}{c^2\,\ln(f)\,\sqrt{c\,\ln(f)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x + c*x^2)*x^2,x)
```

```
[Out] (f^a*f^(c*x^2)*f^(b*x)*x)/(2*c*log(f)) - (b*f^a*f^(c*x^2)*f^(b*x))/(4*c^2*l
og(f)) - (f^(a - b^2/(4*c))*pi^(1/2)*erfi(((b*log(f))/2 + c*x*log(f))/(c*lo
g(f))^(1/2))*(c/4 - (b^2*log(f))/8))/(c^2*log(f)*(c*log(f))^(1/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+bx+cx^2}x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*x**2+b*x+a)*x**2,x)
```

```
[Out] Integral(f**(a + b*x + c*x**2)*x**2, x)
```

3.428 $\int f^{a+bx+cx^2} x \, dx$

Optimal. Leaf size=81

$$\frac{f^{a+bx+cx^2}}{2c\log(f)} - \frac{\sqrt{\pi}\, b f^{a-\frac{b^2}{4c}} \operatorname{erfi}\left(\frac{\sqrt{\log(f)}\,(b+2cx)}{2\sqrt{c}}\right)}{4c^{3/2}\sqrt{\log(f)}}$$

```
[Out] 1/2*f^(c*x^2+b*x+a)/c/ln(f)-1/4*b*f^(a-1/4/c*b^2)*erfi(1/2*(2*c*x+b)*ln(f)^
(1/2)/c^(1/2))*Pi^(1/2)/c^(3/2)/ln(f)^(1/2)
```

Rubi [A] time = 0.04, antiderivative size = 81, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.214, Rules used = {2240, 2234, 2204}

$$\frac{f^{a+bx+cx^2}}{2c\log(f)} - \frac{\sqrt{\pi}\, b f^{a-\frac{b^2}{4c}} \operatorname{Erfi}\left(\frac{\sqrt{\log(f)}\,(b+2cx)}{2\sqrt{c}}\right)}{4c^{3/2}\sqrt{\log(f)}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x + c*x^2)*x,x]
```

```
[Out] f^(a + b*x + c*x^2)/(2*c*Log[f]) - (b*f^(a - b^2/(4*c))*Sqrt[Pi]*Erfi[((b +
 2*c*x)*Sqrt[Log[f]])/(2*Sqrt[c])])/(4*c^(3/2)*Sqrt[Log[f]])
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2234

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_)), x_Symbol
] :> Simp[(e*F^(a + b*x + c*x^2))/(2*c*Log[F]), x] - Dist[(b*e - 2*c*d)/(2*
c), Int[F^(a + b*x + c*x^2), x], x] /; FreeQ[{F, a, b, c, d, e}, x] && NeQ[
b*e - 2*c*d, 0]
```

Rubi steps

$$\int f^{a+bx+cx^2} x\,dx = \frac{f^{a+bx+cx^2}}{2c\log(f)} - \frac{b\int f^{a+bx+cx^2}\,dx}{2c}$$
$$= \frac{f^{a+bx+cx^2}}{2c\log(f)} - \frac{\left(bf^{a-\frac{b^2}{4c}}\right)\int f^{\frac{(b+2cx)^2}{4c}}\,dx}{2c}$$
$$= \frac{f^{a+bx+cx^2}}{2c\log(f)} - \frac{bf^{a-\frac{b^2}{4c}}\sqrt{\pi}\,\text{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)}{4c^{3/2}\sqrt{\log(f)}}$$

Mathematica [A] time = 0.07, size = 81, normalized size = 1.00

$$\frac{f^{a+bx+cx^2}}{2c\log(f)} - \frac{\sqrt{\pi}\,bf^{a-\frac{b^2}{4c}}\text{erfi}\left(\frac{\sqrt{\log(f)}(b+2cx)}{2\sqrt{c}}\right)}{4c^{3/2}\sqrt{\log(f)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x + c*x^2)*x,x]
```

```
[Out] f^(a + b*x + c*x^2)/(2*c*Log[f]) - (b*f^(a - b^2/(4*c))*Sqrt[Pi]*Erfi[((b +
 2*c*x)*Sqrt[Log[f]])/(2*Sqrt[c])])/(4*c^(3/2)*Sqrt[Log[f]])
```

fricas [A] time = 0.41, size = 73, normalized size = 0.90

$$\frac{2\,cf^{cx^2+bx+a} + \frac{\sqrt{\pi}\,\sqrt{-c\log(f)}\,b\,\text{erf}\left(\frac{(2\,cx+b)\sqrt{-c\log(f)}}{2\,c}\right)}{f^{\frac{b^2-4\,ac}{4\,c}}}}{4\,c^2\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*x,x, algorithm="fricas")
```

```
[Out] 1/4*(2*c*f^(c*x^2 + b*x + a) + sqrt(pi)*sqrt(-c*log(f))*b*erf(1/2*(2*c*x +
b)*sqrt(-c*log(f))/c)/f^(1/4*(b^2 - 4*a*c)/c))/(c^2*log(f))
```

giac [A] time = 0.44, size = 80, normalized size = 0.99

$$\frac{\frac{\sqrt{\pi}\,b\,\text{erf}\left(-\frac{1}{2}\,\sqrt{-c\log(f)}\left(2\,x+\frac{b}{c}\right)\right)e^{\left(-\frac{b^2\log(f)-4\,ac\log(f)}{4\,c}\right)}}{\sqrt{-c\log(f)}} + \frac{2\,e^{\left(cx^2\log(f)+bx\log(f)+a\log(f)\right)}}{\log(f)}}{4\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*x,x, algorithm="giac")
```

```
[Out] 1/4*(sqrt(pi)*b*erf(-1/2*sqrt(-c*log(f))*(2*x + b/c))*e^(-1/4*(b^2*log(f) -
 4*a*c*log(f))/c)/sqrt(-c*log(f)) + 2*e^(c*x^2*log(f) + b*x*log(f) + a*log(
f))/log(f))/c
```

maple [A] time = 0.05, size = 79, normalized size = 0.98

$$\frac{\sqrt{\pi}\, b\, f^{a} f^{-\frac{b^{2}}{4c}} \operatorname{erf}\left(\frac{b\ln(f)}{2\sqrt{-c\ln(f)}}-\sqrt{-c\ln(f)}\, x\right)}{4\sqrt{-c\ln(f)}\, c}+\frac{f^{a} f^{bx} f^{c\,x^{2}}}{2c\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*x^2+b*x+a)*x,x)
```

```
[Out] 1/2/c/ln(f)*f^(c*x^2)*f^(b*x)*f^a+1/4*b/c*Pi^(1/2)*f^a*f^(-1/4*b^2/c)/(-c*l
n(f))^(1/2)*erf(1/2/(-c*ln(f))^(1/2)*b*ln(f)-(-c*ln(f))^(1/2)*x)
```

maxima [A] time = 2.03, size = 107, normalized size = 1.32

$$-\frac{\left(\frac{\sqrt{\pi}\,(2\,cx+b)b\left(\operatorname{erf}\left(\frac{1}{2}\sqrt{-\frac{(2\,cx+b)^{2}\log(f)}{c}}\right)-1\right)\log(f)^{2}}{\sqrt{-\frac{(2\,cx+b)^{2}\log(f)}{c}}\left(c\log(f)\right)^{\frac{3}{2}}}-\frac{2\,cf^{\frac{(2\,cx+b)^{2}}{4\,c}}\log(f)}{\left(c\log(f)\right)^{\frac{3}{2}}}\right)f^{a-\frac{b^{2}}{4\,c}}}{4\sqrt{c\log(f)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*x,x, algorithm="maxima")
```

```
[Out] -1/4*(sqrt(pi)*(2*c*x + b)*b*(erf(1/2*sqrt(-(2*c*x + b)^2*log(f)/c)) - 1)*l
og(f)^2/(sqrt(-(2*c*x + b)^2*log(f)/c)*(c*log(f))^(3/2)) - 2*c*f^(1/4*(2*c*
x + b)^2/c)*log(f)/(c*log(f))^(3/2))*f^(a - 1/4*b^2/c)/sqrt(c*log(f))
```

mupad [B] time = 3.57, size = 71, normalized size = 0.88

$$\frac{f^{a}\, f^{c\,x^{2}}\, f^{b\,x}}{2\,c\,\ln(f)}-\frac{b\,f^{a-\frac{b^{2}}{4\,c}}\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{\frac{b\,\ln(f)}{2}+c\,x\,\ln(f)}{\sqrt{c\,\ln(f)}}\right)}{4\,c\,\sqrt{c\,\ln(f)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x + c*x^2)*x,x)
```

```
[Out] (f^a*f^(c*x^2)*f^(b*x))/(2*c*log(f)) - (b*f^(a - b^2/(4*c))*pi^(1/2)*erfi((
(b*log(f))/2 + c*x*log(f))/(c*log(f))^(1/2)))/(4*c*(c*log(f))^(1/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+bx+cx^2}x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*x**2+b*x+a)*x,x)
```

```
[Out] Integral(f**(a + b*x + c*x**2)*x, x)
```

3.429 $\int f^{a+bx+cx^2}\,dx$

Optimal. Leaf size=56

$$\frac{\sqrt{\pi}\, f^{a-\frac{b^2}{4c}}\operatorname{erfi}\left(\frac{\sqrt{\log(f)}\,(b+2cx)}{2\sqrt{c}}\right)}{2\sqrt{c}\,\sqrt{\log(f)}}$$

```
[Out] 1/2*f^(a-1/4/c*b^2)*erfi(1/2*(2*c*x+b)*ln(f)^(1/2)/c^(1/2))*Pi^(1/2)/c^(1/2
)/ln(f)^(1/2)
```

Rubi [A] time = 0.01, antiderivative size = 56, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {2234, 2204}

$$\frac{\sqrt{\pi}\, f^{a-\frac{b^2}{4c}}\operatorname{Erfi}\left(\frac{\sqrt{\log(f)}\,(b+2cx)}{2\sqrt{c}}\right)}{2\sqrt{c}\,\sqrt{\log(f)}}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x + c*x^2),x]
```

```
[Out] (f^(a - b^2/(4*c))*Sqrt[Pi]*Erfi[((b + 2*c*x)*Sqrt[Log[f]])/(2*Sqrt[c])])/(
2*Sqrt[c]*Sqrt[Log[f]])
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2234

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rubi steps

$$\begin{aligned}\int f^{a+bx+cx^2}\,dx &= f^{a-\frac{b^2}{4c}}\int f^{\frac{(b+2cx)^2}{4c}}\,dx\\ &= \frac{f^{a-\frac{b^2}{4c}}\sqrt{\pi}\operatorname{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)}{2\sqrt{c}\,\sqrt{\log(f)}}\end{aligned}$$

Mathematica [A] time = 0.01, size = 56, normalized size = 1.00

$$\frac{\sqrt{\pi}\, f^{a-\frac{b^2}{4c}}\,\mathrm{erfi}\left(\frac{\sqrt{\log(f)}\,(b+2cx)}{2\sqrt{c}}\right)}{2\sqrt{c}\,\sqrt{\log(f)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x + c*x^2),x]
```

```
[Out] (f^(a - b^2/(4*c))*Sqrt[Pi]*Erfi[((b + 2*c*x)*Sqrt[Log[f]])/(2*Sqrt[c])])/(
2*Sqrt[c]*Sqrt[Log[f]])
```

fricas [A] time = 0.41, size = 55, normalized size = 0.98

$$-\frac{\sqrt{\pi}\,\sqrt{-c\log(f)}\,\mathrm{erf}\left(\frac{(2\,cx+b)\sqrt{-c\log(f)}}{2\,c}\right)}{2\,cf^{\frac{b^2-4\,ac}{4\,c}}\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a),x, algorithm="fricas")
```

```
[Out] -1/2*sqrt(pi)*sqrt(-c*log(f))*erf(1/2*(2*c*x + b)*sqrt(-c*log(f))/c)/(c*f^(
1/4*(b^2 - 4*a*c)/c)*log(f))
```

giac [A] time = 0.39, size = 50, normalized size = 0.89

$$-\frac{\sqrt{\pi}\,\mathrm{erf}\left(-\frac{1}{2}\,\sqrt{-c\log(f)}\left(2\,x+\frac{b}{c}\right)\right)e^{\left(-\frac{b^2\log(f)-4\,ac\log(f)}{4\,c}\right)}}{2\,\sqrt{-c\log(f)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a),x, algorithm="giac")
```

```
[Out] -1/2*sqrt(pi)*erf(-1/2*sqrt(-c*log(f))*(2*x + b/c))*e^(-1/4*(b^2*log(f) - 4
*a*c*log(f))/c)/sqrt(-c*log(f))
```

maple [A] time = 0.05, size = 50, normalized size = 0.89

$$-\frac{\sqrt{\pi}\,f^{a}f^{-\frac{b^2}{4c}}\,\mathrm{erf}\left(\frac{b\ln(f)}{2\sqrt{-c\ln(f)}}-\sqrt{-c\ln(f)}\,x\right)}{2\sqrt{-c\ln(f)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*x^2+b*x+a),x)
```

```
[Out] -1/2*Pi^(1/2)*f^a*f^(-1/4*b^2/c)/(-c*ln(f))^(1/2)*erf(1/2/(-c*ln(f))^(1/2)*
b*ln(f)-(-c*ln(f))^(1/2)*x)
```

maxima [A] time = 1.06, size = 50, normalized size = 0.89

$$\frac{\sqrt{\pi}\, f^{a} \operatorname{erf}\left(\sqrt{-c\log(f)}\, x - \frac{b\log(f)}{2\sqrt{-c\log(f)}}\right)}{2\sqrt{-c\log(f)}\, f^{\frac{b^2}{4c}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a),x, algorithm="maxima")
```

```
[Out] 1/2*sqrt(pi)*f^a*erf(sqrt(-c*log(f))*x - 1/2*b*log(f)/sqrt(-c*log(f)))/(sqr
t(-c*log(f))*f^(1/4*b^2/c))
```

mupad [B] time = 3.53, size = 49, normalized size = 0.88

$$-\frac{f^{a}\sqrt{\pi}\, e^{-\frac{b^2\ln(f)}{4c}} \operatorname{erf}\left(\frac{b\ln(f)\,1\mathrm{i}+c\,x\ln(f)\,2\mathrm{i}}{2\sqrt{c\ln(f)}}\right) 1\mathrm{i}}{2\sqrt{c\ln(f)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x + c*x^2),x)
```

```
[Out] -(f^a*pi^(1/2)*exp(-(b^2*log(f))/(4*c))*erf((b*log(f)*1i + c*x*log(f)*2i)/(
2*(c*log(f))^(1/2)))*1i)/(2*(c*log(f))^(1/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+bx+cx^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*x**2+b*x+a),x)
```

```
[Out] Integral(f**(a + b*x + c*x**2), x)
```

3.430 $\int \frac{f^{a+bx+cx^2}}{x} dx$

Optimal. Leaf size=19

$$\text{Int}\left(\frac{f^{a+bx+cx^2}}{x}, x\right)$$

[Out] Unintegrable(f^(c*x^2+b*x+a)/x,x)

Rubi [A] time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{f^{a+bx+cx^2}}{x} dx$$

Verification is Not applicable to the result.

[In] Int[f^(a + b*x + c*x^2)/x,x]

[Out] Defer[Int][f^(a + b*x + c*x^2)/x, x]

Rubi steps

$$\int \frac{f^{a+bx+cx^2}}{x} dx = \int \frac{f^{a+bx+cx^2}}{x} dx$$

Mathematica [A] time = 0.12, size = 0, normalized size = 0.00

$$\int \frac{f^{a+bx+cx^2}}{x} dx$$

Verification is Not applicable to the result.

[In] Integrate[f^(a + b*x + c*x^2)/x,x]

[Out] Integrate[f^(a + b*x + c*x^2)/x, x]

fricas [A] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{f^{cx^2+bx+a}}{x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)/x,x, algorithm="fricas")
```

```
[Out] integral(f^(c*x^2 + b*x + a)/x, x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{cx^2+bx+a}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)/x,x, algorithm="giac")
```

```
[Out] integrate(f^(c*x^2 + b*x + a)/x, x)
```

maple [A] time = 0.03, size = 0, normalized size = 0.00

$$\int \frac{f^{c\,x^2+bx+a}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*x^2+b*x+a)/x,x)
```

```
[Out] int(f^(c*x^2+b*x+a)/x,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{cx^2+bx+a}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)/x,x, algorithm="maxima")
```

```
[Out] integrate(f^(c*x^2 + b*x + a)/x, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.05

$$\int \frac{f^{c\,x^2+b\,x+a}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x + c*x^2)/x,x)
```

```
[Out] int(f^(a + b*x + c*x^2)/x, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+bx+cx^2}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*x**2+b*x+a)/x,x)
```

```
[Out] Integral(f**(a + b*x + c*x**2)/x, x)
```

3.431 $\int \frac{f^{a+bx+cx^2}}{x^2} dx$

Optimal. Leaf size=94

$$b\log(f)\text{Int}\left(\frac{f^{a+bx+cx^2}}{x},x\right)+\sqrt{\pi}\sqrt{c}\sqrt{\log(f)}\,f^{a-\frac{b^2}{4c}}\text{erfi}\left(\frac{\sqrt{\log(f)}\,(b+2cx)}{2\sqrt{c}}\right)-\frac{f^{a+bx+cx^2}}{x}$$

```
[Out] -f^(c*x^2+b*x+a)/x+f^(a-1/4/c*b^2)*erfi(1/2*(2*c*x+b)*ln(f)^(1/2)/c^(1/2))*
c^(1/2)*Pi^(1/2)*ln(f)^(1/2)+b*ln(f)*Unintegrable(f^(c*x^2+b*x+a)/x,x)
```

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{f^{a+bx+cx^2}}{x^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[f^(a + b*x + c*x^2)/x^2,x]
```

```
[Out] -(f^(a + b*x + c*x^2)/x) + Sqrt[c]*f^(a - b^2/(4*c))*Sqrt[Pi]*Erfi[((b + 2*
c*x)*Sqrt[Log[f]])/(2*Sqrt[c])]*Sqrt[Log[f]] + b*Log[f]*Defer[Int][f^(a + b
*x + c*x^2)/x, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{f^{a+bx+cx^2}}{x^2}\,dx &= -\frac{f^{a+bx+cx^2}}{x}+(b\log(f))\int \frac{f^{a+bx+cx^2}}{x}\,dx+(2c\log(f))\int f^{a+bx+cx^2}\,dx\\
&= -\frac{f^{a+bx+cx^2}}{x}+(b\log(f))\int \frac{f^{a+bx+cx^2}}{x}\,dx+\left(2cf^{a-\frac{b^2}{4c}}\log(f)\right)\int f^{\frac{(b+2cx)^2}{4c}}\,dx\\
&= -\frac{f^{a+bx+cx^2}}{x}+\sqrt{c}\,f^{a-\frac{b^2}{4c}}\sqrt{\pi}\,\text{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)\sqrt{\log(f)}+(b\log(f))\int \frac{f^{a+bx+cx^2}}{x}\,dx
\end{aligned}$$

Mathematica [A] time = 0.27, size = 0, normalized size = 0.00

$$\int \frac{f^{a+bx+cx^2}}{x^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[f^(a + b*x + c*x^2)/x^2,x]
[Out] Integrate[f^(a + b*x + c*x^2)/x^2, x]
```

fricas [A] time = 0.40, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{f^{cx^2+bx+a}}{x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)/x^2,x, algorithm="fricas")
[Out] integral(f^(c*x^2 + b*x + a)/x^2, x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{cx^2+bx+a}}{x^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)/x^2,x, algorithm="giac")
[Out] integrate(f^(c*x^2 + b*x + a)/x^2, x)
```

maple [A] time = 0.04, size = 0, normalized size = 0.00

$$\int \frac{f^{c\,x^2+bx+a}}{x^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*x^2+b*x+a)/x^2,x)
[Out] int(f^(c*x^2+b*x+a)/x^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{cx^2+bx+a}}{x^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)/x^2,x, algorithm="maxima")
[Out] integrate(f^(c*x^2 + b*x + a)/x^2, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{f^{c\,x^2+b\,x+a}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x + c*x^2)/x^2,x)
```

```
[Out] int(f^(a + b*x + c*x^2)/x^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+bx+cx^2}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*x**2+b*x+a)/x**2,x)
```

```
[Out] Integral(f**(a + b*x + c*x**2)/x**2, x)
```

3.432 $\int e^{a+bx-cx^2} x^3 \, dx$

Optimal. Leaf size=181

$$-\frac{3\sqrt{\pi}\, b e^{a+\frac{b^2}{4c}} \operatorname{erf}\left(\frac{b-2cx}{2\sqrt{c}}\right)}{8c^{5/2}}-\frac{b^2 e^{a+bx-cx^2}}{8c^3}-\frac{\sqrt{\pi}\, b^3 e^{a+\frac{b^2}{4c}} \operatorname{erf}\left(\frac{b-2cx}{2\sqrt{c}}\right)}{16c^{7/2}}-\frac{bxe^{a+bx-cx^2}}{4c^2}-\frac{e^{a+bx-cx^2}}{2c^2}-\frac{x^2e^{a+bx-cx^2}}{2c}$$

```
[Out] -1/8*b^2*exp(-c*x^2+b*x+a)/c^3-1/2*exp(-c*x^2+b*x+a)/c^2-1/4*b*exp(-c*x^2+b
*x+a)*x/c^2-1/2*exp(-c*x^2+b*x+a)*x^2/c-1/16*b^3*exp(a+1/4/c*b^2)*erf(1/2*(
-2*c*x+b)/c^(1/2))*Pi^(1/2)/c^(7/2)-3/8*b*exp(a+1/4/c*b^2)*erf(1/2*(-2*c*x+
b)/c^(1/2))*Pi^(1/2)/c^(5/2)
```

Rubi [A] time = 0.18, antiderivative size = 181, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 4, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.235$, Rules used = {2241, 2240, 2234, 2205}

$$-\frac{\sqrt{\pi}\, b^3 e^{a+\frac{b^2}{4c}} \operatorname{Erf}\left(\frac{b-2cx}{2\sqrt{c}}\right)}{16c^{7/2}}-\frac{3\sqrt{\pi}\, b e^{a+\frac{b^2}{4c}} \operatorname{Erf}\left(\frac{b-2cx}{2\sqrt{c}}\right)}{8c^{5/2}}-\frac{b^2 e^{a+bx-cx^2}}{8c^3}-\frac{bxe^{a+bx-cx^2}}{4c^2}-\frac{e^{a+bx-cx^2}}{2c^2}-\frac{x^2e^{a+bx-cx^2}}{2c}$$

Antiderivative was successfully verified.

```
[In] Int[E^(a + b*x - c*x^2)*x^3,x]
```

```
[Out] -(b^2*E^(a + b*x - c*x^2))/(8*c^3) - E^(a + b*x - c*x^2)/(2*c^2) - (b*E^(a
+ b*x - c*x^2)*x)/(4*c^2) - (E^(a + b*x - c*x^2)*x^2)/(2*c) - (b^3*E^(a + b
^2/(4*c))*Sqrt[Pi]*Erf[(b - 2*c*x)/(2*Sqrt[c])])/(16*c^(7/2)) - (3*b*E^(a +
 b^2/(4*c))*Sqrt[Pi]*Erf[(b - 2*c*x)/(2*Sqrt[c])])/(8*c^(5/2))
```

Rule 2205

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erf[(c + d*x)*Rt[-(b*Log[F]), 2]])/(2*d*Rt[-(b*Log[F]), 2]), x] /; Fr
eeQ[{F, a, b, c, d}, x] && NegQ[b]
```

Rule 2234

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_)), x_Symbol
] :> Simp[(e*F^(a + b*x + c*x^2))/(2*c*Log[F]), x] - Dist[(b*e - 2*c*d)/(2*
c), Int[F^(a + b*x + c*x^2), x], x] /; FreeQ[{F, a, b, c, d, e}, x] && NeQ[
```

```
b*e - 2*c*d, 0]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_))^(m_), x_S
ymbol] :> Simp[(e*(d + e*x)^(m - 1)*F^(a + b*x + c*x^2))/(2*c*Log[F]), x] +
 (-Dist[(b*e - 2*c*d)/(2*c), Int[(d + e*x)^(m - 1)*F^(a + b*x + c*x^2), x],
 x] - Dist[((m - 1)*e^2)/(2*c*Log[F]), Int[(d + e*x)^(m - 2)*F^(a + b*x + c
*x^2), x], x]) /; FreeQ[{F, a, b, c, d, e}, x] && NeQ[b*e - 2*c*d, 0] && Gt
Q[m, 1]
```

Rubi steps

$$\begin{aligned}
\int e^{a+bx-cx^2}x^3\,dx &= -\frac{e^{a+bx-cx^2}x^2}{2c}+\frac{\int e^{a+bx-cx^2}x\,dx}{c}+\frac{b\int e^{a+bx-cx^2}x^2\,dx}{2c}\\
&= -\frac{e^{a+bx-cx^2}}{2c^2}-\frac{be^{a+bx-cx^2}x}{4c^2}-\frac{e^{a+bx-cx^2}x^2}{2c}+\frac{b\int e^{a+bx-cx^2}\,dx}{4c^2}+\frac{b\int e^{a+bx-cx^2}\,dx}{2c^2}+\frac{b^2\int e^{a+bx-cx^2}x}{4c^2}\\
&= -\frac{b^2e^{a+bx-cx^2}}{8c^3}-\frac{e^{a+bx-cx^2}}{2c^2}-\frac{be^{a+bx-cx^2}x}{4c^2}-\frac{e^{a+bx-cx^2}x^2}{2c}+\frac{b^3\int e^{a+bx-cx^2}\,dx}{8c^3}+\frac{\left(be^{a+\frac{b^2}{4c}}\right)\int e^{-\frac{(b-2cx)^2}{4c}}}{4c^2}\\
&= -\frac{b^2e^{a+bx-cx^2}}{8c^3}-\frac{e^{a+bx-cx^2}}{2c^2}-\frac{be^{a+bx-cx^2}x}{4c^2}-\frac{e^{a+bx-cx^2}x^2}{2c}-\frac{3be^{a+\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erf}\left(\frac{b-2cx}{2\sqrt{c}}\right)}{8c^{5/2}}+\frac{\left(b^3e^{a+\frac{b^2}{4c}}\right)\int e}{8c^3}\\
&= -\frac{b^2e^{a+bx-cx^2}}{8c^3}-\frac{e^{a+bx-cx^2}}{2c^2}-\frac{be^{a+bx-cx^2}x}{4c^2}-\frac{e^{a+bx-cx^2}x^2}{2c}-\frac{b^3e^{a+\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erf}\left(\frac{b-2cx}{2\sqrt{c}}\right)}{16c^{7/2}}-\frac{3be^{a+\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{er}}{8c^{5/2}}
\end{aligned}$$

Mathematica [A] time = 0.23, size = 91, normalized size = 0.50

$$-\frac{e^a\left(\sqrt{\pi}\,b\left(b^2+6c\right)e^{\frac{b^2}{4c}}\mathrm{erf}\left(\frac{b-2cx}{2\sqrt{c}}\right)+2\sqrt{c}\,e^{x(b-cx)}\left(b^2+2bcx+4c\left(cx^2+1\right)\right)\right)}{16c^{7/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a + b*x - c*x^2)*x^3,x]
```

```
[Out] -1/16*(E^a*(2*Sqrt[c]*E^(x*(b - c*x))*(b^2 + 2*b*c*x + 4*c*(1 + c*x^2)) + b
*(b^2 + 6*c)*E^(b^2/(4*c))*Sqrt[Pi]*Erf[(b - 2*c*x)/(2*Sqrt[c])]))/c^(7/2)
```

fricas [A] time = 0.39, size = 89, normalized size = 0.49

$$\frac{\sqrt{\pi}\left(b^3+6\,bc\right)\sqrt{c}\;\mathrm{erf}\left(\frac{2\,cx-b}{2\,\sqrt{c}}\right)e^{\left(\frac{b^2+4\,ac}{4\,c}\right)}-2\left(4\,c^3x^2+2\,bc^2x+b^2c+4\,c^2\right)e^{\left(-cx^2+bx+a\right)}}{16\,c^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-c*x^2+b*x+a)*x^3,x, algorithm="fricas")
```

```
[Out] 1/16*(sqrt(pi)*(b^3 + 6*b*c)*sqrt(c)*erf(1/2*(2*c*x - b)/sqrt(c))*e^(1/4*(b
^2 + 4*a*c)/c) - 2*(4*c^3*x^2 + 2*b*c^2*x + b^2*c + 4*c^2)*e^(-c*x^2 + b*x
+ a))/c^4
```

giac [A] time = 0.42, size = 104, normalized size = 0.57

$$-\frac{\frac{\sqrt{\pi}\left(b^3+6\,bc\right)\mathrm{erf}\left(-\frac{1}{2}\,\sqrt{c}\left(2\,x-\frac{b}{c}\right)\right)e^{\left(\frac{b^2+4\,ac}{4\,c}\right)}}{\sqrt{c}}+2\left(c^2\left(2\,x-\frac{b}{c}\right)^2+3\,bc\left(2\,x-\frac{b}{c}\right)+3\,b^2+4\,c\right)e^{\left(-cx^2+bx+a\right)}}{16\,c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-c*x^2+b*x+a)*x^3,x, algorithm="giac")
```

```
[Out] -1/16*(sqrt(pi)*(b^3 + 6*b*c)*erf(-1/2*sqrt(c)*(2*x - b/c))*e^(1/4*(b^2 + 4
*a*c)/c)/sqrt(c) + 2*(c^2*(2*x - b/c)^2 + 3*b*c*(2*x - b/c) + 3*b^2 + 4*c)*
e^(-c*x^2 + b*x + a))/c^3
```

maple [A] time = 0.02, size = 194, normalized size = 1.07

$$-\frac{x^2\mathrm{e}^{-c\,x^2+bx+a}}{2c}+\frac{\left(-\frac{x\,\mathrm{e}^{-c\,x^2+bx+a}}{2c}-\frac{\sqrt{\pi}\;\mathrm{erf}\left(-\sqrt{c}\;x+\frac{b}{2\,\sqrt{c}}\right)\mathrm{e}^{a+\frac{b^2}{4c}}}{4c^{\frac{3}{2}}}+\frac{\left(-\frac{\sqrt{\pi}\;b\,\mathrm{erf}\left(-\sqrt{c}\;x+\frac{b}{2\,\sqrt{c}}\right)\mathrm{e}^{a+\frac{b^2}{4c}}}{4c^{\frac{3}{2}}}-\frac{\mathrm{e}^{-c\,x^2+bx+a}}{2c}\right)b}{2c}\right)b}{2c}+\frac{-\frac{\sqrt{\pi}\;b\,\mathrm{erf}\left(-\sqrt{c}\;x+\right.}{4c^{\frac{3}{2}}}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(-c*x^2+b*x+a)*x^3,x)
```

```
[Out] -1/2*exp(-c*x^2+b*x+a)*x^2/c+1/2*b/c*(-1/2*exp(-c*x^2+b*x+a)*x/c+1/2*b/c*(-
1/2*exp(-c*x^2+b*x+a)/c-1/4*b/c^(3/2)*Pi^(1/2)*exp(a+1/4*b^2/c)*erf(-c^(1/2
```

```
)*x+1/2*b/c^(1/2)))-1/4/c^(3/2)*Pi^(1/2)*exp(a+1/4*b^2/c)*erf(-c^(1/2)*x+1/
2*b/c^(1/2)))+1/c*(-1/2*exp(-c*x^2+b*x+a)/c-1/4*b/c^(3/2)*Pi^(1/2)*exp(a+1/
4*b^2/c)*erf(-c^(1/2)*x+1/2*b/c^(1/2)))
```

maxima [A] time = 2.20, size = 181, normalized size = 1.00

$$\frac{\left(\frac{\sqrt{\pi}(2cx-b)b^3\left(\operatorname{erf}\left(\frac{1}{2}\sqrt{\frac{(2cx-b)^2}{c}}\right)-1\right)}{\sqrt{\frac{(2cx-b)^2}{c}}(-c)^{\frac{7}{2}}}-\frac{6b^2ce^{\left(-\frac{(2cx-b)^2}{4c}\right)}}{(-c)^{\frac{7}{2}}}-\frac{12(2cx-b)^3b\Gamma\left(\frac{3}{2},\frac{(2cx-b)^2}{4c}\right)}{\left(\frac{(2cx-b)^2}{c}\right)^{\frac{3}{2}}(-c)^{\frac{7}{2}}}-\frac{8c^2\Gamma\left(2,\frac{(2cx-b)^2}{4c}\right)}{(-c)^{\frac{7}{2}}}\right)e^{\left(a+\frac{b^2}{4c}\right)}}{16\sqrt{-c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-c*x^2+b*x+a)*x^3,x, algorithm="maxima")
```

```
[Out] 1/16*(sqrt(pi)*(2*c*x - b)*b^3*(erf(1/2*sqrt((2*c*x - b)^2/c)) - 1)/(sqrt((
2*c*x - b)^2/c)*(-c)^(7/2)) - 6*b^2*c*e^(-1/4*(2*c*x - b)^2/c)/(-c)^(7/2) -
 12*(2*c*x - b)^3*b*gamma(3/2, 1/4*(2*c*x - b)^2/c)/((((2*c*x - b)^2/c)^(3/2
)*(-c)^(7/2)) - 8*c^2*gamma(2, 1/4*(2*c*x - b)^2/c)/(-c)^(7/2))*e^(a + 1/4*
b^2/c)/sqrt(-c)
```

mupad [B] time = 0.30, size = 112, normalized size = 0.62

$$-e^{-c\,x^2+b\,x+a}\,\left(\frac{1}{2\,c^2}+\frac{b^2}{8\,c^3}\right)-\frac{x^2\,e^{-c\,x^2+b\,x+a}}{2\,c}-\frac{b\,x\,e^{-c\,x^2+b\,x+a}}{4\,c^2}-\frac{\sqrt{\pi}\,\operatorname{erfi}\left(\frac{\frac{b}{2}-c\,x}{\sqrt{-c}}\right)\,e^{a+\frac{b^2}{4\,c}}\,\left(b^3+6\,c\,b\right)}{16\,{(-c)}^{7/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*exp(a + b*x - c*x^2),x)
```

```
[Out] - exp(a + b*x - c*x^2)*(1/(2*c^2) + b^2/(8*c^3)) - (x^2*exp(a + b*x - c*x^2
))/(2*c) - (b*x*exp(a + b*x - c*x^2))/(4*c^2) - (pi^(1/2)*erfi((b/2 - c*x)/
(-c)^(1/2))*exp(a + b^2/(4*c))*(6*b*c + b^3))/(16*(-c)^(7/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$e^{a}\int x^{3}e^{bx}e^{-cx^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-c*x**2+b*x+a)*x**3,x)
```

```
[Out] exp(a)*Integral(x**3*exp(b*x)*exp(-c*x**2), x)
```

3.433 $\int e^{a+bx-cx^2}x^2\,dx$

Optimal. Leaf size=134

$$-\frac{\sqrt{\pi}\,b^2e^{a+\frac{b^2}{4c}}\operatorname{erf}\left(\frac{b-2cx}{2\sqrt{c}}\right)}{8c^{5/2}}-\frac{\sqrt{\pi}\,e^{a+\frac{b^2}{4c}}\operatorname{erf}\left(\frac{b-2cx}{2\sqrt{c}}\right)}{4c^{3/2}}-\frac{be^{a+bx-cx^2}}{4c^2}-\frac{xe^{a+bx-cx^2}}{2c}$$

```
[Out] -1/4*b*exp(-c*x^2+b*x+a)/c^2-1/2*exp(-c*x^2+b*x+a)*x/c-1/8*b^2*exp(a+1/4/c*
b^2)*erf(1/2*(-2*c*x+b)/c^(1/2))*Pi^(1/2)/c^(5/2)-1/4*exp(a+1/4/c*b^2)*erf(
1/2*(-2*c*x+b)/c^(1/2))*Pi^(1/2)/c^(3/2)
```

Rubi [A] time = 0.08, antiderivative size = 134, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.235, Rules used = {2241, 2240, 2234, 2205}

$$-\frac{\sqrt{\pi}\,b^2e^{a+\frac{b^2}{4c}}\operatorname{Erf}\left(\frac{b-2cx}{2\sqrt{c}}\right)}{8c^{5/2}}-\frac{\sqrt{\pi}\,e^{a+\frac{b^2}{4c}}\operatorname{Erf}\left(\frac{b-2cx}{2\sqrt{c}}\right)}{4c^{3/2}}-\frac{be^{a+bx-cx^2}}{4c^2}-\frac{xe^{a+bx-cx^2}}{2c}$$

Antiderivative was successfully verified.

```
[In] Int[E^(a + b*x - c*x^2)*x^2,x]
```

```
[Out] -(b*E^(a + b*x - c*x^2))/(4*c^2) - (E^(a + b*x - c*x^2)*x)/(2*c) - (b^2*E^(
a + b^2/(4*c))*Sqrt[Pi]*Erf[(b - 2*c*x)/(2*Sqrt[c])])/(8*c^(5/2)) - (E^(a +
 b^2/(4*c))*Sqrt[Pi]*Erf[(b - 2*c*x)/(2*Sqrt[c])])/(4*c^(3/2))
```

Rule 2205

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erf[(c + d*x)*Rt[-(b*Log[F]), 2]])/(2*d*Rt[-(b*Log[F]), 2]), x] /; Fr
eeQ[{F, a, b, c, d}, x] && NegQ[b]
```

Rule 2234

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_)), x_Symbol
] :> Simp[(e*F^(a + b*x + c*x^2))/(2*c*Log[F]), x] - Dist[(b*e - 2*c*d)/(2*
c), Int[F^(a + b*x + c*x^2), x], x] /; FreeQ[{F, a, b, c, d, e}, x] && NeQ[
b*e - 2*c*d, 0]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_))^(m_), x_S
ymbol] :> Simp[(e*(d + e*x)^(m - 1)*F^(a + b*x + c*x^2))/(2*c*Log[F]), x] +
 (-Dist[(b*e - 2*c*d)/(2*c), Int[(d + e*x)^(m - 1)*F^(a + b*x + c*x^2), x],
 x] - Dist[((m - 1)*e^2)/(2*c*Log[F]), Int[(d + e*x)^(m - 2)*F^(a + b*x + c
*x^2), x], x]) /; FreeQ[{F, a, b, c, d, e}, x] && NeQ[b*e - 2*c*d, 0] && Gt
Q[m, 1]
```

Rubi steps

$$\begin{aligned}
\int e^{a+bx-cx^2}x^2\,dx &= -\frac{e^{a+bx-cx^2}x}{2c}+\frac{\int e^{a+bx-cx^2}\,dx}{2c}+\frac{b\int e^{a+bx-cx^2}x\,dx}{2c}\\
&= -\frac{be^{a+bx-cx^2}}{4c^2}-\frac{e^{a+bx-cx^2}x}{2c}+\frac{b^2\int e^{a+bx-cx^2}\,dx}{4c^2}+\frac{e^{a+\frac{b^2}{4c}}\int e^{-\frac{(b-2cx)^2}{4c}}\,dx}{2c}\\
&= -\frac{be^{a+bx-cx^2}}{4c^2}-\frac{e^{a+bx-cx^2}x}{2c}-\frac{e^{a+\frac{b^2}{4c}}\sqrt{\pi}\operatorname{erf}\left(\frac{b-2cx}{2\sqrt{c}}\right)}{4c^{3/2}}+\frac{\left(b^2e^{a+\frac{b^2}{4c}}\right)\int e^{-\frac{(b-2cx)^2}{4c}}\,dx}{4c^2}\\
&= -\frac{be^{a+bx-cx^2}}{4c^2}-\frac{e^{a+bx-cx^2}x}{2c}-\frac{b^2e^{a+\frac{b^2}{4c}}\sqrt{\pi}\operatorname{erf}\left(\frac{b-2cx}{2\sqrt{c}}\right)}{8c^{5/2}}-\frac{e^{a+\frac{b^2}{4c}}\sqrt{\pi}\operatorname{erf}\left(\frac{b-2cx}{2\sqrt{c}}\right)}{4c^{3/2}}
\end{aligned}$$

Mathematica [A] time = 0.12, size = 79, normalized size = 0.59

$$\frac{e^a\left(\sqrt{\pi}\left(b^2+2c\right)e^{\frac{b^2}{4c}}\operatorname{erf}\left(\frac{2cx-b}{2\sqrt{c}}\right)-2\sqrt{c}\,e^{x(b-cx)}(b+2cx)\right)}{8c^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a + b*x - c*x^2)*x^2,x]
```

```
[Out] (E^a*(-2*Sqrt[c]*E^(x*(b - c*x))*(b + 2*c*x) + (b^2 + 2*c)*E^(b^2/(4*c))*Sq
rt[Pi]*Erf[(-b + 2*c*x)/(2*Sqrt[c])]))/(8*c^(5/2))
```

fricas [A] time = 0.39, size = 72, normalized size = 0.54

$$\frac{\sqrt{\pi}\left(b^2+2\,c\right)\sqrt{c}\,\operatorname{erf}\left(\frac{2\,cx-b}{2\,\sqrt{c}}\right)e^{\left(\frac{b^2+4\,ac}{4\,c}\right)}-2\left(2\,c^2x+bc\right)e^{\left(-cx^2+bx+a\right)}}{8\,c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-c*x^2+b*x+a)*x^2,x, algorithm="fricas")
```

```
[Out] 1/8*(sqrt(pi)*(b^2 + 2*c)*sqrt(c)*erf(1/2*(2*c*x - b)/sqrt(c))*e^(1/4*(b^2
+ 4*a*c)/c) - 2*(2*c^2*x + b*c)*e^(-c*x^2 + b*x + a))/c^3
```

giac [A] time = 0.29, size = 80, normalized size = 0.60

$$-\frac{\frac{\sqrt{\pi}\left(b^{2}+2\,c\right)\operatorname{erf}\left(-\frac{1}{2}\,\sqrt{c}\left(2\,x-\frac{b}{c}\right)\right)e^{\left(\frac{b^{2}+4\,ac}{4\,c}\right)}}{\sqrt{c}}+2\left(c\left(2\,x-\frac{b}{c}\right)+2\,b\right)e^{\left(-cx^{2}+bx+a\right)}}{8\,c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-c*x^2+b*x+a)*x^2,x, algorithm="giac")
```

```
[Out] -1/8*(sqrt(pi)*(b^2 + 2*c)*erf(-1/2*sqrt(c)*(2*x - b/c))*e^(1/4*(b^2 + 4*a*
c)/c)/sqrt(c) + 2*(c*(2*x - b/c) + 2*b)*e^(-c*x^2 + b*x + a))/c^2
```

maple [A] time = 0.02, size = 111, normalized size = 0.83

$$-\frac{x\,\mathrm{e}^{-c\,x^{2}+bx+a}}{2c}-\frac{\sqrt{\pi}\ \operatorname{erf}\left(-\sqrt{c}\ x+\frac{b}{2\sqrt{c}}\right)\mathrm{e}^{a+\frac{b^{2}}{4c}}}{4c^{\frac{3}{2}}}+\frac{\left(-\frac{\sqrt{\pi}\ b\operatorname{erf}\left(-\sqrt{c}\ x+\frac{b}{2\sqrt{c}}\right)\mathrm{e}^{a+\frac{b^{2}}{4c}}}{4c^{\frac{3}{2}}}-\frac{\mathrm{e}^{-c\,x^{2}+bx+a}}{2c}\right)b}{2c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(-c*x^2+b*x+a)*x^2,x)
```

```
[Out] -1/2/c*x*exp(-c*x^2+b*x+a)+1/2*b/c*(-1/2/c*exp(-c*x^2+b*x+a)-1/4*b/c^(3/2)*
Pi^(1/2)*exp(a+1/4*b^2/c)*erf(-c^(1/2)*x+1/2*b/c^(1/2)))-1/4/c^(3/2)*Pi^(1/
2)*exp(a+1/4*b^2/c)*erf(-c^(1/2)*x+1/2*b/c^(1/2))
```

maxima [A] time = 2.13, size = 151, normalized size = 1.13

$$-\frac{\left(\frac{\sqrt{\pi}\,(2\,cx-b)b^{2}\left(\operatorname{erf}\left(\frac{1}{2}\,\sqrt{\frac{(2\,cx-b)^{2}}{c}}\right)-1\right)}{\sqrt{\frac{(2\,cx-b)^{2}}{c}}\,(-c)^{\frac{5}{2}}}-\frac{4\,bce^{\left(-\frac{(2\,cx-b)^{2}}{4\,c}\right)}}{(-c)^{\frac{5}{2}}}-\frac{4\,(2\,cx-b)^{3}\Gamma\left(\frac{3}{2},\frac{(2\,cx-b)^{2}}{4\,c}\right)}{\left(\frac{(2\,cx-b)^{2}}{c}\right)^{\frac{3}{2}}(-c)^{\frac{5}{2}}}\right)e^{\left(a+\frac{b^{2}}{4\,c}\right)}}{8\,\sqrt{-c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-c*x^2+b*x+a)*x^2,x, algorithm="maxima")
```

```
[Out] -1/8*(sqrt(pi)*(2*c*x - b)*b^2*(erf(1/2*sqrt((2*c*x - b)^2/c)) - 1)/(sqrt((
2*c*x - b)^2/c)*(-c)^(5/2)) - 4*b*c*e^(-1/4*(2*c*x - b)^2/c)/(-c)^(5/2) - 4
*(2*c*x - b)^3*gamma(3/2, 1/4*(2*c*x - b)^2/c)/(((2*c*x - b)^2/c)^(3/2)*(-c
)^(5/2)))*e^(a + 1/4*b^2/c)/sqrt(-c)
```

mupad [B] time = 3.72, size = 80, normalized size = 0.60

$$\frac{\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\frac{b}{2}-c\,x}{\sqrt{-c}}\right)\,\mathrm{e}^{a+\frac{b^2}{4\,c}}\,\left(b^2+2\,c\right)}{8\,{\left(-c\right)}^{5/2}}-\frac{x\,\mathrm{e}^{-c\,x^2+b\,x+a}}{2\,c}-\frac{b\,\mathrm{e}^{-c\,x^2+b\,x+a}}{4\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*exp(a + b*x - c*x^2),x)
```

```
[Out] (pi^(1/2)*erfi((b/2 - c*x)/(-c)^(1/2))*exp(a + b^2/(4*c))*(2*c + b^2))/(8*(
-c)^(5/2)) - (x*exp(a + b*x - c*x^2))/(2*c) - (b*exp(a + b*x - c*x^2))/(4*c
^2)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$e^{a}\int x^{2}e^{bx}e^{-cx^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-c*x**2+b*x+a)*x**2,x)
```

```
[Out] exp(a)*Integral(x**2*exp(b*x)*exp(-c*x**2), x)
```

3.434 $\int e^{a+bx-cx^2} x \, dx$

Optimal. Leaf size=66

$$-\frac{\sqrt{\pi}\, b e^{a+\frac{b^2}{4c}} \operatorname{erf}\left(\frac{b-2cx}{2\sqrt{c}}\right)}{4c^{3/2}} - \frac{e^{a+bx-cx^2}}{2c}$$

```
[Out] -1/2*exp(-c*x^2+b*x+a)/c-1/4*b*exp(a+1/4/c*b^2)*erf(1/2*(-2*c*x+b)/c^(1/2))
*Pi^(1/2)/c^(3/2)
```

Rubi [A] time = 0.03, antiderivative size = 66, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2240, 2234, 2205}

$$-\frac{\sqrt{\pi}\, b e^{a+\frac{b^2}{4c}} \operatorname{Erf}\left(\frac{b-2cx}{2\sqrt{c}}\right)}{4c^{3/2}} - \frac{e^{a+bx-cx^2}}{2c}$$

Antiderivative was successfully verified.

```
[In] Int[E^(a + b*x - c*x^2)*x,x]
```

```
[Out] -E^(a + b*x - c*x^2)/(2*c) - (b*E^(a + b^2/(4*c))*Sqrt[Pi]*Erf[(b - 2*c*x)/
(2*Sqrt[c])])/(4*c^(3/2))
```

Rule 2205

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erf[(c + d*x)*Rt[-(b*Log[F]), 2]])/(2*d*Rt[-(b*Log[F]), 2]), x] /; Fr
eeQ[{F, a, b, c, d}, x] && NegQ[b]
```

Rule 2234

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_)), x_Symbol
] :> Simp[(e*F^(a + b*x + c*x^2))/(2*c*Log[F]), x] - Dist[(b*e - 2*c*d)/(2*
c), Int[F^(a + b*x + c*x^2), x], x] /; FreeQ[{F, a, b, c, d, e}, x] && NeQ[
b*e - 2*c*d, 0]
```

Rubi steps

$$\int e^{a+bx-cx^2}x\,dx = -\frac{e^{a+bx-cx^2}}{2c} + \frac{b\int e^{a+bx-cx^2}\,dx}{2c}$$
$$= -\frac{e^{a+bx-cx^2}}{2c} + \frac{\left(be^{a+\frac{b^2}{4c}}\right)\int e^{-\frac{(b-2cx)^2}{4c}}\,dx}{2c}$$
$$= -\frac{e^{a+bx-cx^2}}{2c} - \frac{be^{a+\frac{b^2}{4c}}\sqrt{\pi}\operatorname{erf}\left(\frac{b-2cx}{2\sqrt{c}}\right)}{4c^{3/2}}$$

Mathematica [A] time = 0.05, size = 68, normalized size = 1.03

$$\frac{\sqrt{\pi}\,be^{a+\frac{b^2}{4c}}\operatorname{erf}\left(\frac{2cx-b}{2\sqrt{c}}\right)}{4c^{3/2}} - \frac{e^{a+bx-cx^2}}{2c}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a + b*x - c*x^2)*x,x]
[Out] -1/2*E^(a + b*x - c*x^2)/c + (b*E^(a + b^2/(4*c))*Sqrt[Pi]*Erf[(-b + 2*c*x)
/(2*Sqrt[c])])/(4*c^(3/2))
```

fricas [A] time = 0.39, size = 57, normalized size = 0.86

$$\frac{\sqrt{\pi}\,b\sqrt{c}\operatorname{erf}\left(\frac{2\,cx-b}{2\,\sqrt{c}}\right)e^{\left(\frac{b^2+4\,ac}{4\,c}\right)} - 2\,ce^{\left(-cx^2+bx+a\right)}}{4\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-c*x^2+b*x+a)*x,x, algorithm="fricas")
[Out] 1/4*(sqrt(pi)*b*sqrt(c)*erf(1/2*(2*c*x - b)/sqrt(c))*e^(1/4*(b^2 + 4*a*c)/c
) - 2*c*e^(-c*x^2 + b*x + a))/c^2
```

giac [A] time = 0.30, size = 58, normalized size = 0.88

$$-\frac{\frac{\sqrt{\pi}\,b\operatorname{erf}\left(-\frac{1}{2}\,\sqrt{c}\left(2\,x-\frac{b}{c}\right)\right)e^{\left(\frac{b^2+4\,ac}{4\,c}\right)}}{\sqrt{c}} + 2\,e^{\left(-cx^2+bx+a\right)}}{4\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-c*x^2+b*x+a)*x,x, algorithm="giac")
```

```
[Out] -1/4*(sqrt(pi)*b*erf(-1/2*sqrt(c)*(2*x - b/c))*e^(1/4*(b^2 + 4*a*c)/c)/sqrt
(c) + 2*e^(-c*x^2 + b*x + a))/c
```

maple [A] time = 0.02, size = 53, normalized size = 0.80

$$-\frac{\sqrt{\pi}\, b \operatorname{erf}\left(-\sqrt{c}\, x+\frac{b}{2 \sqrt{c}}\right) \mathrm{e}^{a+\frac{b^{2}}{4 c}}}{4 c^{\frac{3}{2}}}-\frac{\mathrm{e}^{-c\, x^{2}+b x+a}}{2 c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(-c*x^2+b*x+a)*x,x)
```

```
[Out] -1/2/c*exp(-c*x^2+b*x+a)-1/4*b/c^(3/2)*Pi^(1/2)*exp(a+1/4*b^2/c)*erf(-c^(1/
2)*x+1/2*b/c^(1/2))
```

maxima [A] time = 1.49, size = 98, normalized size = 1.48

$$\frac{\left(\frac{\sqrt{\pi}\,(2\,cx-b)b\left(\operatorname{erf}\left(\frac{1}{2}\,\sqrt{\frac{(2\,cx-b)^{2}}{c}}\right)-1\right)}{\sqrt{\frac{(2\,cx-b)^{2}}{c}}\,(-c)^{\frac{3}{2}}}-\frac{2\,ce^{\left(-\frac{(2\,cx-b)^{2}}{4\,c}\right)}}{(-c)^{\frac{3}{2}}}\right)e^{\left(a+\frac{b^{2}}{4\,c}\right)}}{4\,\sqrt{-c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-c*x^2+b*x+a)*x,x, algorithm="maxima")
```

```
[Out] 1/4*(sqrt(pi)*(2*c*x - b)*b*(erf(1/2*sqrt((2*c*x - b)^2/c)) - 1)/(sqrt((2*c
*x - b)^2/c)*(-c)^(3/2)) - 2*c*e^(-1/4*(2*c*x - b)^2/c)/(-c)^(3/2))*e^(a +
1/4*b^2/c)/sqrt(-c)
```

mupad [B] time = 3.47, size = 58, normalized size = 0.88

$$-\frac{\mathrm{e}^{b\,x}\,\mathrm{e}^{a}\,\mathrm{e}^{-c\,x^{2}}}{2\,c}-\frac{b\,\sqrt{\pi}\,\mathrm{e}^{\frac{b^{2}}{4\,c}}\,\mathrm{e}^{a}\,\mathrm{erfi}\left(\frac{b}{2\,\sqrt{-c}}+\sqrt{-c}\,x\right)}{4\,{(-c)}^{3/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*exp(a + b*x - c*x^2),x)
```

```
[Out] - (exp(b*x)*exp(a)*exp(-c*x^2))/(2*c) - (b*pi^(1/2)*exp(b^2/(4*c))*exp(a)*e
rfi(b/(2*(-c)^(1/2)) + (-c)^(1/2)*x))/(4*(-c)^(3/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$e^{a}\int xe^{bx}e^{-cx^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-c*x**2+b*x+a)*x,x)
```

```
[Out] exp(a)*Integral(x*exp(b*x)*exp(-c*x**2), x)
```

3.435 $\int e^{a+bx-cx^2}\,dx$

Optimal. Leaf size=44

$$-\frac{\sqrt{\pi}\,e^{a+\frac{b^2}{4c}}\operatorname{erf}\left(\frac{b-2cx}{2\sqrt{c}}\right)}{2\sqrt{c}}$$

```
[Out] -1/2*exp(a+1/4/c*b^2)*erf(1/2*(-2*c*x+b)/c^(1/2))*Pi^(1/2)/c^(1/2)
```

Rubi [A] time = 0.01, antiderivative size = 44, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2234, 2205}

$$-\frac{\sqrt{\pi}\,e^{a+\frac{b^2}{4c}}\operatorname{Erf}\left(\frac{b-2cx}{2\sqrt{c}}\right)}{2\sqrt{c}}$$

Antiderivative was successfully verified.

```
[In] Int[E^(a + b*x - c*x^2),x]
```

```
[Out] -(E^(a + b^2/(4*c))*Sqrt[Pi]*Erf[(b - 2*c*x)/(2*Sqrt[c])])/(2*Sqrt[c])
```

Rule 2205

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erf[(c + d*x)*Rt[-(b*Log[F]), 2]])/(2*d*Rt[-(b*Log[F]), 2]), x] /; Fr
eeQ[{F, a, b, c, d}, x] && NegQ[b]
```

Rule 2234

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rubi steps

$$\begin{aligned}\int e^{a+bx-cx^2}\,dx &= e^{a+\frac{b^2}{4c}}\int e^{-\frac{(b-2cx)^2}{4c}}\,dx\\ &= -\frac{e^{a+\frac{b^2}{4c}}\sqrt{\pi}\operatorname{erf}\left(\frac{b-2cx}{2\sqrt{c}}\right)}{2\sqrt{c}}\end{aligned}$$

Mathematica [A] time = 0.01, size = 46, normalized size = 1.05

$$\frac{\sqrt{\pi}e^{a+\frac{b^2}{4c}}\text{erf}\left(\frac{2cx-b}{2\sqrt{c}}\right)}{2\sqrt{c}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a + b*x - c*x^2),x]
[Out] (E^(a + b^2/(4*c))*Sqrt[Pi]*Erf[(-b + 2*c*x)/(2*Sqrt[c])])/(2*Sqrt[c])
```

fricas [A] time = 0.39, size = 36, normalized size = 0.82

$$\frac{\sqrt{\pi}\ \text{erf}\left(\frac{2\,cx-b}{2\,\sqrt{c}}\right)e^{\left(\frac{b^2+4\,ac}{4\,c}\right)}}{2\,\sqrt{c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-c*x^2+b*x+a),x, algorithm="fricas")
[Out] 1/2*sqrt(pi)*erf(1/2*(2*c*x - b)/sqrt(c))*e^(1/4*(b^2 + 4*a*c)/c)/sqrt(c)
```

giac [A] time = 0.39, size = 38, normalized size = 0.86

$$-\frac{\sqrt{\pi}\ \text{erf}\left(-\frac{1}{2}\,\sqrt{c}\left(2\,x-\frac{b}{c}\right)\right)e^{\left(\frac{b^2+4\,ac}{4\,c}\right)}}{2\,\sqrt{c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-c*x^2+b*x+a),x, algorithm="giac")
[Out] -1/2*sqrt(pi)*erf(-1/2*sqrt(c)*(2*x - b/c))*e^(1/4*(b^2 + 4*a*c)/c)/sqrt(c)
```

maple [A] time = 0.01, size = 34, normalized size = 0.77

$$-\frac{\sqrt{\pi}\ \text{erf}\left(-\sqrt{c}\ x+\frac{b}{2\sqrt{c}}\right)\mathrm{e}^{a+\frac{b^2}{4c}}}{2\sqrt{c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(-c*x^2+b*x+a),x)
```

[Out] -1/2*Pi^(1/2)*exp(a+1/4*b^2/c)/c^(1/2)*erf(-c^(1/2)*x+1/2*b/c^(1/2))

maxima [A] time = 0.82, size = 32, normalized size = 0.73

$$\frac{\sqrt{\pi}\,\mathrm{erf}\left(\sqrt{c}\,x-\frac{b}{2\,\sqrt{c}}\right)e^{\left(a+\frac{b^2}{4\,c}\right)}}{2\,\sqrt{c}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(exp(-c*x^2+b*x+a),x, algorithm="maxima")

[Out] 1/2*sqrt(pi)*erf(sqrt(c)*x - 1/2*b/sqrt(c))*e^(a + 1/4*b^2/c)/sqrt(c)

mupad [B] time = 0.03, size = 40, normalized size = 0.91

$$-\frac{\sqrt{\pi}\,\mathrm{erf}\left(\frac{b\,1\mathrm{i}-c\,x\,2\mathrm{i}}{2\,\sqrt{-c}}\right)\,\mathrm{e}^{a+\frac{b^2}{4\,c}}\,1\mathrm{i}}{2\,\sqrt{-c}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(exp(a + b*x - c*x^2),x)

[Out] -(pi^(1/2)*erf((b*1i - c*x*2i)/(2*(-c)^(1/2)))*exp(a + b^2/(4*c))*1i)/(2*(-c)^(1/2))

sympy [A] time = 0.70, size = 41, normalized size = 0.93

$$\frac{\sqrt{\pi}\,\sqrt{-\frac{1}{c}}\,e^{a+\frac{b^2}{4c}}\,\mathrm{erfi}\left(\frac{b-2cx}{2\sqrt{-c}}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(exp(-c*x**2+b*x+a),x)

[Out] sqrt(pi)*sqrt(-1/c)*exp(a + b**2/(4*c))*erfi((b - 2*c*x)/(2*sqrt(-c)))/2

3.436 $\int \frac{e^{a+bx-cx^2}}{x} dx$

Optimal. Leaf size=20

$$\text{Int}\left(\frac{e^{a+bx-cx^2}}{x},x\right)$$

```
[Out] Unintegrable(exp(-c*x^2+b*x+a)/x,x)
```

Rubi [A] time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{e^{a+bx-cx^2}}{x} dx$$

Verification is Not applicable to the result.

```
[In] Int[E^(a + b*x - c*x^2)/x,x]
[Out] Defer[Int][E^(a + b*x - c*x^2)/x, x]
```

Rubi steps

$$\int \frac{e^{a+bx-cx^2}}{x} dx = \int \frac{e^{a+bx-cx^2}}{x} dx$$

Mathematica [A] time = 0.13, size = 0, normalized size = 0.00

$$\int \frac{e^{a+bx-cx^2}}{x} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[E^(a + b*x - c*x^2)/x,x]
[Out] Integrate[E^(a + b*x - c*x^2)/x, x]
```

fricas [A] time = 0.40, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{e^{\left(-cx^2+bx+a\right)}}{x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-c*x^2+b*x+a)/x,x, algorithm="fricas")
[Out] integral(e^(-c*x^2 + b*x + a)/x, x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{\left(-cx^2+bx+a\right)}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-c*x^2+b*x+a)/x,x, algorithm="giac")
[Out] integrate(e^(-c*x^2 + b*x + a)/x, x)
```

maple [A] time = 0.03, size = 0, normalized size = 0.00

$$\int \frac{\mathrm{e}^{-c\,x^2+bx+a}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(-c*x^2+b*x+a)/x,x)
[Out] int(exp(-c*x^2+b*x+a)/x,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{\left(-cx^2+bx+a\right)}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-c*x^2+b*x+a)/x,x, algorithm="maxima")
[Out] integrate(e^(-c*x^2 + b*x + a)/x, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.05

$$\int \frac{\mathrm{e}^{-c\,x^2+b\,x+a}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(a + b*x - c*x^2)/x,x)
[Out] int(exp(a + b*x - c*x^2)/x, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$e^{a}\int\frac{e^{bx}e^{-cx^{2}}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-c*x**2+b*x+a)/x,x)
```

```
[Out] exp(a)*Integral(exp(b*x)*exp(-c*x**2)/x, x)
```

3.437 $\int \frac{e^{a+bx-cx^2}}{x^2}\,dx$

Optimal. Leaf size=82

$$b\text{Int}\left(\frac{e^{a+bx-cx^2}}{x},x\right)+\sqrt{\pi}\,\sqrt{c}\,e^{a+\frac{b^2}{4c}}\,\text{erf}\left(\frac{b-2cx}{2\sqrt{c}}\right)-\frac{e^{a+bx-cx^2}}{x}$$

```
[Out] -exp(-c*x^2+b*x+a)/x+exp(a+1/4/c*b^2)*erf(1/2*(-2*c*x+b)/c^(1/2))*c^(1/2)*P
i^(1/2)+b*Unintegrable(exp(-c*x^2+b*x+a)/x,x)
```

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{e^{a+bx-cx^2}}{x^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[E^(a + b*x - c*x^2)/x^2,x]
```

```
[Out] -(E^(a + b*x - c*x^2)/x) + Sqrt[c]*E^(a + b^2/(4*c))*Sqrt[Pi]*Erf[(b - 2*c*
x)/(2*Sqrt[c])] + b*Defer[Int][E^(a + b*x - c*x^2)/x, x]
```

Rubi steps

$$\begin{aligned}\int \frac{e^{a+bx-cx^2}}{x^2}\,dx &= -\frac{e^{a+bx-cx^2}}{x}+b\int \frac{e^{a+bx-cx^2}}{x}\,dx-(2c)\int e^{a+bx-cx^2}\,dx\\ &= -\frac{e^{a+bx-cx^2}}{x}+b\int \frac{e^{a+bx-cx^2}}{x}\,dx-\left(2ce^{a+\frac{b^2}{4c}}\right)\int e^{-\frac{(b-2cx)^2}{4c}}\,dx\\ &= -\frac{e^{a+bx-cx^2}}{x}+\sqrt{c}\,e^{a+\frac{b^2}{4c}}\sqrt{\pi}\,\text{erf}\left(\frac{b-2cx}{2\sqrt{c}}\right)+b\int \frac{e^{a+bx-cx^2}}{x}\,dx\end{aligned}$$

Mathematica [A] time = 0.23, size = 0, normalized size = 0.00

$$\int \frac{e^{a+bx-cx^2}}{x^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[E^(a + b*x - c*x^2)/x^2,x]
```

```
[Out] Integrate[E^(a + b*x - c*x^2)/x^2, x]
```

fricas [A] time = 0.40, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{e^{\left(-cx^2+bx+a\right)}}{x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-c*x^2+b*x+a)/x^2,x, algorithm="fricas")
[Out] integral(e^(-c*x^2 + b*x + a)/x^2, x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{\left(-cx^2+bx+a\right)}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-c*x^2+b*x+a)/x^2,x, algorithm="giac")
[Out] integrate(e^(-c*x^2 + b*x + a)/x^2, x)
```

maple [A] time = 0.03, size = 0, normalized size = 0.00

$$\int \frac{e^{-c\,x^2+bx+a}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(-c*x^2+b*x+a)/x^2,x)
[Out] int(exp(-c*x^2+b*x+a)/x^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{\left(-cx^2+bx+a\right)}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-c*x^2+b*x+a)/x^2,x, algorithm="maxima")
[Out] integrate(e^(-c*x^2 + b*x + a)/x^2, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{e}^{-c\,x^2+b\,x+a}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(a + b*x - c*x^2)/x^2,x)
[Out] int(exp(a + b*x - c*x^2)/x^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$e^{a}\int \frac{e^{bx}e^{-cx^2}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-c*x**2+b*x+a)/x**2,x)
[Out] exp(a)*Integral(exp(b*x)*exp(-c*x**2)/x**2, x)
```

3.438 $\int e^{(a+bx)(c+dx)}x^3\,dx$

Optimal. Leaf size=297

$$-\frac{\sqrt{\pi}e^{-\frac{(bc-ad)^2}{4bd}}(ad+bc)^3\text{erfi}\left(\frac{ad+bc+2bdx}{2\sqrt{b}\sqrt{d}}\right)}{16b^{7/2}d^{7/2}}+\frac{3\sqrt{\pi}e^{-\frac{(bc-ad)^2}{4bd}}(ad+bc)\text{erfi}\left(\frac{ad+bc+2bdx}{2\sqrt{b}\sqrt{d}}\right)}{8b^{5/2}d^{5/2}}+\frac{(ad+bc)^2e^{x(ad+bc)+ac+bdx^2}}{8b^3d^3}-\frac{x(\ldots}{}$$

```
[Out] -1/2*exp(a*c+(a*d+b*c)*x+b*d*x^2)/b^2/d^2+1/8*(a*d+b*c)^2*exp(a*c+(a*d+b*c)
*x+b*d*x^2)/b^3/d^3-1/4*(a*d+b*c)*exp(a*c+(a*d+b*c)*x+b*d*x^2)*x/b^2/d^2+1/
2*exp(a*c+(a*d+b*c)*x+b*d*x^2)*x^2/b/d+3/8*(a*d+b*c)*erfi(1/2*(2*b*d*x+a*d+
b*c)/b^(1/2)/d^(1/2))*Pi^(1/2)/b^(5/2)/d^(5/2)/exp(1/4*(-a*d+b*c)^2/b/d)-1/
16*(a*d+b*c)^3*erfi(1/2*(2*b*d*x+a*d+b*c)/b^(1/2)/d^(1/2))*Pi^(1/2)/b^(7/2)
/d^(7/2)/exp(1/4*(-a*d+b*c)^2/b/d)
```

Rubi [A] time = 0.64, antiderivative size = 297, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 5, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.294, Rules used = {2244, 2241, 2240, 2234, 2204}

$$-\frac{\sqrt{\pi}e^{-\frac{(bc-ad)^2}{4bd}}(ad+bc)^3\text{Erfi}\left(\frac{ad+bc+2bdx}{2\sqrt{b}\sqrt{d}}\right)}{16b^{7/2}d^{7/2}}+\frac{3\sqrt{\pi}e^{-\frac{(bc-ad)^2}{4bd}}(ad+bc)\text{Erfi}\left(\frac{ad+bc+2bdx}{2\sqrt{b}\sqrt{d}}\right)}{8b^{5/2}d^{5/2}}+\frac{(ad+bc)^2e^{x(ad+bc)+ac+bdx^2}}{8b^3d^3}-\frac{x(\ldots}{}$$

Antiderivative was successfully verified.

```
[In] Int[E^((a + b*x)*(c + d*x))*x^3,x]
```

```
[Out] -E^(a*c + (b*c + a*d)*x + b*d*x^2)/(2*b^2*d^2) + ((b*c + a*d)^2*E^(a*c + (b
*c + a*d)*x + b*d*x^2))/(8*b^3*d^3) - ((b*c + a*d)*E^(a*c + (b*c + a*d)*x +
 b*d*x^2)*x)/(4*b^2*d^2) + (E^(a*c + (b*c + a*d)*x + b*d*x^2)*x^2)/(2*b*d)
+ (3*(b*c + a*d)*Sqrt[Pi]*Erfi[(b*c + a*d + 2*b*d*x)/(2*Sqrt[b]*Sqrt[d])])/
(8*b^(5/2)*d^(5/2)*E^((b*c - a*d)^2/(4*b*d))) - ((b*c + a*d)^3*Sqrt[Pi]*Erf
i[(b*c + a*d + 2*b*d*x)/(2*Sqrt[b]*Sqrt[d])])/(16*b^(7/2)*d^(7/2)*E^((b*c -
 a*d)^2/(4*b*d)))
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2234

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_)), x_Symbol
] :> Simp[(e*F^(a + b*x + c*x^2))/(2*c*Log[F]), x] - Dist[(b*e - 2*c*d)/(2*
c), Int[F^(a + b*x + c*x^2), x], x] /; FreeQ[{F, a, b, c, d, e}, x] && NeQ[
b*e - 2*c*d, 0]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_))^(m_), x_S
ymbol] :> Simp[(e*(d + e*x)^(m - 1)*F^(a + b*x + c*x^2))/(2*c*Log[F]), x] +
 (-Dist[(b*e - 2*c*d)/(2*c), Int[(d + e*x)^(m - 1)*F^(a + b*x + c*x^2), x],
 x] - Dist[((m - 1)*e^2)/(2*c*Log[F]), Int[(d + e*x)^(m - 2)*F^(a + b*x + c
*x^2), x], x]) /; FreeQ[{F, a, b, c, d, e}, x] && NeQ[b*e - 2*c*d, 0] && Gt
Q[m, 1]
```

Rule 2244

```
Int[(F_)^(v_)*(u_)^(m_.), x_Symbol] :> Int[ExpandToSum[u, x]^m*F^ExpandToSu
m[v, x], x] /; FreeQ[{F, m}, x] && LinearQ[u, x] && QuadraticQ[v, x] &&  !(
LinearMatchQ[u, x] && QuadraticMatchQ[v, x])
```

Rubi steps

$$\int e^{(a+bx)(c+dx)}x^3\,dx = \int e^{ac+(bc+ad)x+bdx^2}x^3\,dx$$

$$= \frac{e^{ac+(bc+ad)x+bdx^2}x^2}{2bd} - \frac{\int e^{ac+(bc+ad)x+bdx^2}x\,dx}{bd} - \frac{(bc+ad)\int e^{ac+(bc+ad)x+bdx^2}x^2\,dx}{2bd}$$

$$= -\frac{e^{ac+(bc+ad)x+bdx^2}}{2b^2d^2} - \frac{(bc+ad)e^{ac+(bc+ad)x+bdx^2}x}{4b^2d^2} + \frac{e^{ac+(bc+ad)x+bdx^2}x^2}{2bd} + \frac{(bc+ad)\int e^{ac+(bc+a}}{4b^2d^2}$$

$$= -\frac{e^{ac+(bc+ad)x+bdx^2}}{2b^2d^2} + \frac{(bc+ad)^2e^{ac+(bc+ad)x+bdx^2}}{8b^3d^3} - \frac{(bc+ad)e^{ac+(bc+ad)x+bdx^2}x}{4b^2d^2} + \frac{e^{ac+(bc+ad)x+}}{2bd}$$

$$= -\frac{e^{ac+(bc+ad)x+bdx^2}}{2b^2d^2} + \frac{(bc+ad)^2e^{ac+(bc+ad)x+bdx^2}}{8b^3d^3} - \frac{(bc+ad)e^{ac+(bc+ad)x+bdx^2}x}{4b^2d^2} + \frac{e^{ac+(bc+ad)x+}}{2bd}$$

$$= -\frac{e^{ac+(bc+ad)x+bdx^2}}{2b^2d^2} + \frac{(bc+ad)^2e^{ac+(bc+ad)x+bdx^2}}{8b^3d^3} - \frac{(bc+ad)e^{ac+(bc+ad)x+bdx^2}x}{4b^2d^2} + \frac{e^{ac+(bc+ad)x+}}{2bd}$$

Mathematica [A] time = 0.36, size = 191, normalized size = 0.64

$$\frac{e^{-\frac{(bc-ad)^2}{4bd}}\left(2\sqrt{b}\sqrt{d}\,e^{\frac{(ad+b(c+2dx))^2}{4bd}}\left(a^2d^2-2bd(-ac+adx+2)+b^2\left(c^2-2cdx+4d^2x^2\right)\right)-\sqrt{\pi}\left(a^3d^3+3b^2cd(ac-2)\right.\right.}{16b^{7/2}d^{7/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^((a + b*x)*(c + d*x))*x^3,x]
```

```
[Out] (2*Sqrt[b]*Sqrt[d]*E^((a*d + b*(c + 2*d*x))^2/(4*b*d))*(a^2*d^2 - 2*b*d*(2
- a*c + a*d*x) + b^2*(c^2 - 2*c*d*x + 4*d^2*x^2)) - (b^3*c^3 + 3*b^2*c*(-2
+ a*c)*d + 3*a*b*(-2 + a*c)*d^2 + a^3*d^3)*Sqrt[Pi]*Erfi[(a*d + b*(c + 2*d*
x))/(2*Sqrt[b]*Sqrt[d])])/(16*b^(7/2)*d^(7/2)*E^((b*c - a*d)^2/(4*b*d)))
```

fricas [A] time = 0.40, size = 212, normalized size = 0.71

$$\frac{\sqrt{\pi}\left(b^3c^3+a^3d^3+3\left(a^2bc-2\,ab\right)d^2+3\left(ab^2c^2-2\,b^2c\right)d\right)\sqrt{-bd}\ \operatorname{erf}\left(\frac{(2\,bdx+bc+ad)\sqrt{-bd}}{2\,bd}\right)e^{\left(-\frac{b^2c^2-2\,abcd+a^2d^2}{4\,bd}\right)}+2\left(4\,b^3d\right.}{16\,b^4d^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)*(d*x+c))*x^3,x, algorithm="fricas")
```

```
[Out] 1/16*(sqrt(pi)*(b^3*c^3 + a^3*d^3 + 3*(a^2*b*c - 2*a*b)*d^2 + 3*(a*b^2*c^2
- 2*b^2*c)*d)*sqrt(-b*d)*erf(1/2*(2*b*d*x + b*c + a*d)*sqrt(-b*d)/(b*d))*e^
(-1/4*(b^2*c^2 - 2*a*b*c*d + a^2*d^2)/(b*d)) + 2*(4*b^3*d^3*x^2 + b^3*c^2*d
 + a^2*b*d^3 + 2*(a*b^2*c - 2*b^2)*d^2 - 2*(b^3*c*d^2 + a*b^2*d^3)*x)*e^(b*
d*x^2 + a*c + (b*c + a*d)*x))/(b^4*d^4)
```

giac [A] time = 0.30, size = 250, normalized size = 0.84

$$\frac{\frac{\sqrt{\pi}\left(b^3c^3+3\,ab^2c^2d+3\,a^2bcd^2+a^3d^3-6\,b^2cd-6\,abd^2\right)\operatorname{erf}\left(-\frac{1}{2}\sqrt{-bd}\left(2\,x+\frac{bc+ad}{bd}\right)\right)e^{\left(-\frac{b^2c^2-2\,abcd+a^2d^2}{4\,bd}\right)}}{\sqrt{-bd}}+2\left(b^2d^2\left(2\,x+\frac{bc+ad}{bd}\right)^2-3\,b^2cd\left(2\,x\right.\right.}{16\,b^3d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)*(d*x+c))*x^3,x, algorithm="giac")
```

```
[Out] 1/16*(sqrt(pi)*(b^3*c^3 + 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 + a^3*d^3 - 6*b^2*c
*d - 6*a*b*d^2)*erf(-1/2*sqrt(-b*d)*(2*x + (b*c + a*d)/(b*d)))*e^(-1/4*(b^2
*c^2 - 2*a*b*c*d + a^2*d^2)/(b*d))/sqrt(-b*d) + 2*(b^2*d^2*(2*x + (b*c + a*
d)/(b*d))^2 - 3*b^2*c*d*(2*x + (b*c + a*d)/(b*d)) - 3*a*b*d^2*(2*x + (b*c +
```

```
 a*d)/(b*d)) + 3*b^2*c^2 + 6*a*b*c*d + 3*a^2*d^2 - 4*b*d)*e^(b*d*x^2 + b*c*
x + a*d*x + a*c))/(b^3*d^3)
```

maple [A] time = 0.02, size = 368, normalized size = 1.24

$$\frac{x^2 e^{bd\,x^2+ac+(ad+bc)x}}{2bd}-\frac{(ad+bc)\left(\frac{x\,e^{bd\,x^2+ac+(ad+bc)x}}{2bd}+\frac{\sqrt{\pi}\ \mathrm{erf}\left(-\sqrt{-bd}\ x+\frac{ad+bc}{2\sqrt{-bd}}\right)e^{ac-\frac{(ad+bc)^2}{4bd}}}{4\sqrt{-bd}\ bd}-\frac{(ad+bc)\left(\frac{(ad+bc)\sqrt{\pi}\ \mathrm{erf}\left(-\sqrt{-bd}\ x+\frac{ad+bc}{2\sqrt{-bd}}\right)}{4\sqrt{-bd}\ bd}\right.}{2bd}\right.}{2bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp((b*x+a)*(d*x+c))*x^3,x)
```

```
[Out] 1/2*exp(b*d*x^2+a*c+(a*d+b*c)*x)*x^2/b/d-1/2*(a*d+b*c)/b/d*(1/2*exp(b*d*x^2
+a*c+(a*d+b*c)*x)*x/b/d-1/2*(a*d+b*c)/b/d*(1/2*exp(b*d*x^2+a*c+(a*d+b*c)*x)
/b/d+1/4*(a*d+b*c)/b/d*Pi^(1/2)*exp(a*c-1/4*(a*d+b*c)^2/b/d)/(-b*d)^(1/2)*e
rf(-(-b*d)^(1/2)*x+1/2*(a*d+b*c)/(-b*d)^(1/2)))+1/4/b/d*Pi^(1/2)*exp(a*c-1/
4*(a*d+b*c)^2/b/d)/(-b*d)^(1/2)*erf(-(-b*d)^(1/2)*x+1/2*(a*d+b*c)/(-b*d)^(1
/2)))-1/b/d*(1/2*exp(b*d*x^2+a*c+(a*d+b*c)*x)/b/d+1/4*(a*d+b*c)/b/d*Pi^(1/2
)*exp(a*c-1/4*(a*d+b*c)^2/b/d)/(-b*d)^(1/2)*erf(-(-b*d)^(1/2)*x+1/2*(a*d+b*
c)/(-b*d)^(1/2)))
```

maxima [A] time = 2.11, size = 267, normalized size = 0.90

$$-\frac{\left(\frac{\sqrt{\pi}\,(2\,bdx+bc+ad)(bc+ad)^3\left(\mathrm{erf}\left(\frac{1}{2}\sqrt{-\frac{(2\,bdx+bc+ad)^2}{bd}}\right)-1\right)}{(bd)^{\frac{7}{2}}\sqrt{-\frac{(2\,bdx+bc+ad)^2}{bd}}}-\frac{6\,(bc+ad)^2bde^{\left(\frac{(2\,bdx+bc+ad)^2}{4\,bd}\right)}}{(bd)^{\frac{7}{2}}}+\frac{8\,b^2d^2\Gamma\left(2,-\frac{(2\,bdx+bc+ad)^2}{4\,bd}\right)}{(bd)^{\frac{7}{2}}}-\frac{12\,(2\,bdx+bc+ad)^3}{(bd)^{\frac{7}{2}}\left(-\right.}\right.}{16\sqrt{bd}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)*(d*x+c))*x^3,x, algorithm="maxima")
```

```
[Out] -1/16*(sqrt(pi)*(2*b*d*x + b*c + a*d)*(b*c + a*d)^3*(erf(1/2*sqrt(-(2*b*d*x
 + b*c + a*d)^2/(b*d))) - 1)/((b*d)^(7/2)*sqrt(-(2*b*d*x + b*c + a*d)^2/(b*
d))) - 6*(b*c + a*d)^2*b*d*e^(1/4*(2*b*d*x + b*c + a*d)^2/(b*d))/(b*d)^(7/2
) + 8*b^2*d^2*gamma(2, -1/4*(2*b*d*x + b*c + a*d)^2/(b*d))/(b*d)^(7/2) - 12
*(2*b*d*x + b*c + a*d)^3*(b*c + a*d)*gamma(3/2, -1/4*(2*b*d*x + b*c + a*d)^
2/(b*d))/((b*d)^(7/2)*(-(2*b*d*x + b*c + a*d)^2/(b*d))^(3/2)))*e^(a*c - 1/4
*(b*c + a*d)^2/(b*d))/sqrt(b*d)
```

mupad [B] time = 3.69, size = 230, normalized size = 0.77

$$\frac{e^{a\,c+a\,d\,x+b\,c\,x+b\,d\,x^2}\,\left(\frac{a^2\,d^2}{8}-b\,\left(\frac{d}{2}-\frac{a\,c\,d}{4}\right)+\frac{b^2\,c^2}{8}\right)}{b^3\,d^3}+\frac{x^2\,e^{a\,c+a\,d\,x+b\,c\,x+b\,d\,x^2}}{2\,b\,d}-\frac{x\,e^{a\,c+a\,d\,x+b\,c\,x+b\,d\,x^2}\,\left(a\,d+b\,c\right)}{4\,b^2\,d^2}-\frac{\sqrt{\pi}\,e^{\frac{a\,c}{2}-\frac{a^2}{4b}}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*exp((a + b*x)*(c + d*x)),x)
```

```
[Out] (exp(a*c + a*d*x + b*c*x + b*d*x^2)*((a^2*d^2)/8 - b*(d/2 - (a*c*d)/4) + (b
^2*c^2)/8))/(b^3*d^3) + (x^2*exp(a*c + a*d*x + b*c*x + b*d*x^2))/(2*b*d) -
(x*exp(a*c + a*d*x + b*c*x + b*d*x^2)*(a*d + b*c))/(4*b^2*d^2) - (pi^(1/2)*
exp((a*c)/2 - (a^2*d)/(4*b) - (b*c^2)/(4*d))*erfi(((a*d)/2 + (b*c)/2 + b*d*
x)/(b*d)^(1/2))*(a^3*d^3 + b^3*c^3 - 6*a*b*d^2 - 6*b^2*c*d + 3*a*b^2*c^2*d
+ 3*a^2*b*c*d^2))/(16*b^3*d^3*(b*d)^(1/2))
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)*(d*x+c))*x**3,x)
```

```
[Out] Timed out
```

3.439 $\int e^{(a+bx)(c+dx)}x^2\,dx$

Optimal. Leaf size=216

$$\frac{\sqrt{\pi}\,e^{-\frac{(bc-ad)^2}{4bd}}(ad+bc)^2\text{erfi}\left(\frac{ad+bc+2bdx}{2\sqrt{b}\,\sqrt{d}}\right)}{8b^{5/2}d^{5/2}}-\frac{\sqrt{\pi}\,e^{-\frac{(bc-ad)^2}{4bd}}\text{erfi}\left(\frac{ad+bc+2bdx}{2\sqrt{b}\,\sqrt{d}}\right)}{4b^{3/2}d^{3/2}}-\frac{(ad+bc)e^{x(ad+bc)+ac+bdx^2}}{4b^2d^2}+\frac{xe^{x(ad+bc)+ac+bc}}{2bd}$$

```
[Out] -1/4*(a*d+b*c)*exp(a*c+(a*d+b*c)*x+b*d*x^2)/b^2/d^2+1/2*exp(a*c+(a*d+b*c)*x
+b*d*x^2)*x/b/d-1/4*erfi(1/2*(2*b*d*x+a*d+b*c)/b^(1/2)/d^(1/2))*Pi^(1/2)/b^
(3/2)/d^(3/2)/exp(1/4*(-a*d+b*c)^2/b/d)+1/8*(a*d+b*c)^2*erfi(1/2*(2*b*d*x+a
*d+b*c)/b^(1/2)/d^(1/2))*Pi^(1/2)/b^(5/2)/d^(5/2)/exp(1/4*(-a*d+b*c)^2/b/d)
```

Rubi [A] time = 0.27, antiderivative size = 216, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.294, Rules used = {2244, 2241, 2240, 2234, 2204}

$$\frac{\sqrt{\pi}\,e^{-\frac{(bc-ad)^2}{4bd}}(ad+bc)^2\text{Erfi}\left(\frac{ad+bc+2bdx}{2\sqrt{b}\,\sqrt{d}}\right)}{8b^{5/2}d^{5/2}}-\frac{\sqrt{\pi}\,e^{-\frac{(bc-ad)^2}{4bd}}\text{Erfi}\left(\frac{ad+bc+2bdx}{2\sqrt{b}\,\sqrt{d}}\right)}{4b^{3/2}d^{3/2}}-\frac{(ad+bc)e^{x(ad+bc)+ac+bdx^2}}{4b^2d^2}+\frac{xe^{x(ad+bc)+ac+b}}{2bd}$$

Antiderivative was successfully verified.

```
[In] Int[E^((a + b*x)*(c + d*x))*x^2,x]
```

```
[Out] -((b*c + a*d)*E^(a*c + (b*c + a*d)*x + b*d*x^2))/(4*b^2*d^2) + (E^(a*c + (b
*c + a*d)*x + b*d*x^2)*x)/(2*b*d) - (Sqrt[Pi]*Erfi[(b*c + a*d + 2*b*d*x)/(2
*Sqrt[b]*Sqrt[d])])/(4*b^(3/2)*d^(3/2)*E^((b*c - a*d)^2/(4*b*d))) + ((b*c +
 a*d)^2*Sqrt[Pi]*Erfi[(b*c + a*d + 2*b*d*x)/(2*Sqrt[b]*Sqrt[d])])/(8*b^(5/2
)*d^(5/2)*E^((b*c - a*d)^2/(4*b*d)))
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2234

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_)), x_Symbol
] :> Simp[(e*F^(a + b*x + c*x^2))/(2*c*Log[F]), x] - Dist[(b*e - 2*c*d)/(2*
```

```
c), Int[F^(a + b*x + c*x^2), x], x] /; FreeQ[{F, a, b, c, d, e}, x] && NeQ[
b*e - 2*c*d, 0]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_))^(m_), x_S
ymbol] :> Simp[(e*(d + e*x)^(m - 1)*F^(a + b*x + c*x^2))/(2*c*Log[F]), x] +
 (-Dist[(b*e - 2*c*d)/(2*c), Int[(d + e*x)^(m - 1)*F^(a + b*x + c*x^2), x],
 x] - Dist[((m - 1)*e^2)/(2*c*Log[F]), Int[(d + e*x)^(m - 2)*F^(a + b*x + c
*x^2), x], x]) /; FreeQ[{F, a, b, c, d, e}, x] && NeQ[b*e - 2*c*d, 0] && Gt
Q[m, 1]
```

Rule 2244

```
Int[(F_)^(v_)*(u_)^(m_.), x_Symbol] :> Int[ExpandToSum[u, x]^m*F^ExpandToSu
m[v, x], x] /; FreeQ[{F, m}, x] && LinearQ[u, x] && QuadraticQ[v, x] &&  !(
LinearMatchQ[u, x] && QuadraticMatchQ[v, x])
```

Rubi steps

$$\begin{aligned}
\int e^{(a+bx)(c+dx)}x^2\,dx &= \int e^{ac+(bc+ad)x+bdx^2}x^2\,dx \\
&= \frac{e^{ac+(bc+ad)x+bdx^2}x}{2bd} - \frac{\int e^{ac+(bc+ad)x+bdx^2}\,dx}{2bd} - \frac{(bc+ad)\int e^{ac+(bc+ad)x+bdx^2}x\,dx}{2bd} \\
&= -\frac{(bc+ad)e^{ac+(bc+ad)x+bdx^2}}{4b^2d^2} + \frac{e^{ac+(bc+ad)x+bdx^2}x}{2bd} + \frac{(bc+ad)^2\int e^{ac+(bc+ad)x+bdx^2}\,dx}{4b^2d^2} - \frac{e^{-\frac{(bc-ad)^2}{4bd}}}{} \\
&= -\frac{(bc+ad)e^{ac+(bc+ad)x+bdx^2}}{4b^2d^2} + \frac{e^{ac+(bc+ad)x+bdx^2}x}{2bd} - \frac{e^{-\frac{(bc-ad)^2}{4bd}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{bc+ad+2bdx}{2\sqrt{b}\sqrt{d}}\right)}{4b^{3/2}d^{3/2}} + \frac{\left((bc+ad)\right.}{} \\
&= -\frac{(bc+ad)e^{ac+(bc+ad)x+bdx^2}}{4b^2d^2} + \frac{e^{ac+(bc+ad)x+bdx^2}x}{2bd} - \frac{e^{-\frac{(bc-ad)^2}{4bd}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{bc+ad+2bdx}{2\sqrt{b}\sqrt{d}}\right)}{4b^{3/2}d^{3/2}} + \frac{(bc+ad)^2}{}
\end{aligned}$$

Mathematica [A] time = 0.18, size = 144, normalized size = 0.67

$$\frac{e^{-\frac{(bc-ad)^2}{4bd}}\left(\sqrt{\pi}\left(a^2d^2+2bd(ac-1)+b^2c^2\right)\mathrm{erfi}\left(\frac{ad+b(c+2dx)}{2\sqrt{b}\sqrt{d}}\right)-2\sqrt{b}\sqrt{d}\,e^{\frac{(ad+b(c+2dx))^2}{4bd}}(ad+b(c-2dx))\right)}{8b^{5/2}d^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^((a + b*x)*(c + d*x))*x^2,x]
```

```
[Out] (-2*Sqrt[b]*Sqrt[d]*E^((a*d + b*(c + 2*d*x))^2/(4*b*d))*(a*d + b*(c - 2*d*x
)) + (b^2*c^2 + 2*b*(-1 + a*c)*d + a^2*d^2)*Sqrt[Pi]*Erfi[(a*d + b*(c + 2*d
*x))/(2*Sqrt[b]*Sqrt[d])])/(8*b^(5/2)*d^(5/2)*E^((b*c - a*d)^2/(4*b*d)))
```

fricas [A] time = 0.41, size = 148, normalized size = 0.69

$$-\frac{\sqrt{\pi}\left(b^2c^2+a^2d^2+2\,(abc-b)d\right)\sqrt{-bd}\;\mathrm{erf}\left(\frac{(2\,bdx+bc+ad)\sqrt{-bd}}{2\,bd}\right)e^{\left(-\frac{b^2c^2-2\,abcd+a^2d^2}{4\,bd}\right)}-2\left(2\,b^2d^2x-b^2cd-abd^2\right)e^{\left(bdx^2\right.}}{8\,b^3d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)*(d*x+c))*x^2,x, algorithm="fricas")
```

```
[Out] -1/8*(sqrt(pi)*(b^2*c^2 + a^2*d^2 + 2*(a*b*c - b)*d)*sqrt(-b*d)*erf(1/2*(2*
b*d*x + b*c + a*d)*sqrt(-b*d)/(b*d))*e^(-1/4*(b^2*c^2 - 2*a*b*c*d + a^2*d^2
)/(b*d)) - 2*(2*b^2*d^2*x - b^2*c*d - a*b*d^2)*e^(b*d*x^2 + a*c + (b*c + a*
d)*x))/(b^3*d^3)
```

giac [A] time = 0.44, size = 152, normalized size = 0.70

$$-\frac{\frac{\sqrt{\pi}\left(b^2c^2+2\,abcd+a^2d^2-2\,bd\right)\mathrm{erf}\left(-\frac{1}{2}\sqrt{-bd}\left(2\,x+\frac{bc+ad}{bd}\right)\right)e^{\left(-\frac{b^2c^2-2\,abcd+a^2d^2}{4\,bd}\right)}}{\sqrt{-bd}}-2\left(bd\left(2\,x+\frac{bc+ad}{bd}\right)-2\,bc-2\,ad\right)e^{\left(bdx^2+bcx+adx+ac\right)}}{8\,b^2d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)*(d*x+c))*x^2,x, algorithm="giac")
```

```
[Out] -1/8*(sqrt(pi)*(b^2*c^2 + 2*a*b*c*d + a^2*d^2 - 2*b*d)*erf(-1/2*sqrt(-b*d)*
(2*x + (b*c + a*d)/(b*d)))*e^(-1/4*(b^2*c^2 - 2*a*b*c*d + a^2*d^2)/(b*d))/s
qrt(-b*d) - 2*(b*d*(2*x + (b*c + a*d)/(b*d)) - 2*b*c - 2*a*d)*e^(b*d*x^2 +
b*c*x + a*d*x + a*c))/(b^2*d^2)
```

maple [A] time = 0.02, size = 212, normalized size = 0.98

$$\frac{x\,\mathrm{e}^{bd\,x^2+ac+(ad+bc)x}}{2bd}+\frac{\sqrt{\pi}\;\mathrm{erf}\left(-\sqrt{-bd}\;x+\frac{ad+bc}{2\sqrt{-bd}}\right)\mathrm{e}^{ac-\frac{(ad+bc)^2}{4bd}}}{4\sqrt{-bd}\;bd}-\frac{(ad+bc)\left(\frac{(ad+bc)\sqrt{\pi}\;\mathrm{erf}\left(-\sqrt{-bd}\;x+\frac{ad+bc}{2\sqrt{-bd}}\right)\mathrm{e}^{ac-\frac{(ad+bc)^2}{4bd}}}{4\sqrt{-bd}\;bd}+\cdots\right.}{2bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp((b*x+a)*(d*x+c))*x^2,x)
```

```
[Out] 1/2/b/d*x*exp(b*d*x^2+a*c+(a*d+b*c)*x)-1/2*(a*d+b*c)/b/d*(1/2/b/d*exp(b*d*x
^2+a*c+(a*d+b*c)*x)+1/4*(a*d+b*c)/b/d*Pi^(1/2)*exp(a*c-1/4*(a*d+b*c)^2/b/d)
/(-b*d)^(1/2)*erf(-(-b*d)^(1/2)*x+1/2*(a*d+b*c)/(-b*d)^(1/2)))+1/4/b/d*Pi^(
1/2)*exp(a*c-1/4*(a*d+b*c)^2/b/d)/(-b*d)^(1/2)*erf(-(-b*d)^(1/2)*x+1/2*(a*d
+b*c)/(-b*d)^(1/2))
```

maxima [A] time = 1.90, size = 221, normalized size = 1.02

$$\frac{\left(\frac{\sqrt{\pi}\,(2\,bdx+bc+ad)(bc+ad)^2\left(\operatorname{erf}\left(\frac{1}{2}\sqrt{-\frac{(2\,bdx+bc+ad)^2}{bd}}\right)-1\right)}{(bd)^{\frac{5}{2}}\sqrt{-\frac{(2\,bdx+bc+ad)^2}{bd}}}-\frac{4\,(bc+ad)bde^{\left(\frac{(2\,bdx+bc+ad)^2}{4\,bd}\right)}}{(bd)^{\frac{5}{2}}}-\frac{4\,(2\,bdx+bc+ad)^3\Gamma\left(\frac{3}{2},-\frac{(2\,bdx+bc+ad)^2}{4\,bd}\right)}{(bd)^{\frac{5}{2}}\left(-\frac{(2\,bdx+bc+ad)^2}{bd}\right)^{\frac{3}{2}}}\right)e^{\left(ac-\frac{(bc+ad)^2}{4\,bd}\right)}}{8\,\sqrt{bd}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)*(d*x+c))*x^2,x, algorithm="maxima")
```

```
[Out] 1/8*(sqrt(pi)*(2*b*d*x + b*c + a*d)*(b*c + a*d)^2*(erf(1/2*sqrt(-(2*b*d*x +
 b*c + a*d)^2/(b*d))) - 1)/((b*d)^(5/2)*sqrt(-(2*b*d*x + b*c + a*d)^2/(b*d)
)) - 4*(b*c + a*d)*b*d*e^(1/4*(2*b*d*x + b*c + a*d)^2/(b*d))/(b*d)^(5/2) -
4*(2*b*d*x + b*c + a*d)^3*gamma(3/2, -1/4*(2*b*d*x + b*c + a*d)^2/(b*d))/((
b*d)^(5/2)*(-(2*b*d*x + b*c + a*d)^2/(b*d))^(3/2)))*e^(a*c - 1/4*(b*c + a*d
)^2/(b*d))/sqrt(b*d)
```

mupad [B] time = 0.30, size = 150, normalized size = 0.69

$$\frac{x\,\mathrm{e}^{a\,c+a\,d\,x+b\,c\,x+b\,d\,x^2}}{2\,b\,d}-\frac{\mathrm{e}^{a\,c+a\,d\,x+b\,c\,x+b\,d\,x^2}\,\left(\frac{a\,d}{4}+\frac{b\,c}{4}\right)}{b^2\,d^2}+\frac{\sqrt{\pi}\,\mathrm{e}^{\frac{a\,c}{2}-\frac{a^2\,d}{4\,b}-\frac{b\,c^2}{4\,d}}\,\mathrm{erfi}\left(\frac{\frac{a\,d}{2}+\frac{b\,c}{2}+b\,d\,x}{\sqrt{b\,d}}\right)\,\left(a^2\,d^2+2\,a\,b\,c\,d+b^2\,c^2-2\right.}{8\,b^2\,d^2\,\sqrt{b\,d}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*exp((a + b*x)*(c + d*x)),x)
```

```
[Out] (x*exp(a*c + a*d*x + b*c*x + b*d*x^2))/(2*b*d) - (exp(a*c + a*d*x + b*c*x +
 b*d*x^2)*((a*d)/4 + (b*c)/4))/(b^2*d^2) + (pi^(1/2)*exp((a*c)/2 - (a^2*d)/
(4*b) - (b*c^2)/(4*d))*erfi(((a*d)/2 + (b*c)/2 + b*d*x)/(b*d)^(1/2))*(a^2*d
^2 - 2*b*d + b^2*c^2 + 2*a*b*c*d))/(8*b^2*d^2*(b*d)^(1/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$e^{ac}\int x^2e^{adx}e^{bcx}e^{bdx^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)*(d*x+c))*x**2,x)
```

```
[Out] exp(a*c)*Integral(x**2*exp(a*d*x)*exp(b*c*x)*exp(b*d*x**2), x)
```

3.440 $\int e^{(a+bx)(c+dx)}x\,dx$

Optimal. Leaf size=107

$$\frac{e^{x(ad+bc)+ac+bdx^2}}{2bd}-\frac{\sqrt{\pi}\,(ad+bc)e^{-\frac{(bc-ad)^2}{4bd}}\operatorname{erfi}\left(\frac{ad+bc+2bdx}{2\sqrt{b}\,\sqrt{d}}\right)}{4b^{3/2}d^{3/2}}$$

```
[Out] 1/2*exp(a*c+(a*d+b*c)*x+b*d*x^2)/b/d-1/4*(a*d+b*c)*erfi(1/2*(2*b*d*x+a*d+b*
c)/b^(1/2)/d^(1/2))*Pi^(1/2)/b^(3/2)/d^(3/2)/exp(1/4*(-a*d+b*c)^2/b/d)
```

Rubi [A] time = 0.10, antiderivative size = 107, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267, Rules used = {2244, 2240, 2234, 2204}

$$\frac{e^{x(ad+bc)+ac+bdx^2}}{2bd}-\frac{\sqrt{\pi}\,(ad+bc)e^{-\frac{(bc-ad)^2}{4bd}}\operatorname{Erfi}\left(\frac{ad+bc+2bdx}{2\sqrt{b}\,\sqrt{d}}\right)}{4b^{3/2}d^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[E^((a + b*x)*(c + d*x))*x,x]
```

```
[Out] E^(a*c + (b*c + a*d)*x + b*d*x^2)/(2*b*d) - ((b*c + a*d)*Sqrt[Pi]*Erfi[(b*c
 + a*d + 2*b*d*x)/(2*Sqrt[b]*Sqrt[d])])/(4*b^(3/2)*d^(3/2)*E^((b*c - a*d)^2
/(4*b*d)))
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2234

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_)), x_Symbol
] :> Simp[(e*F^(a + b*x + c*x^2))/(2*c*Log[F]), x] - Dist[(b*e - 2*c*d)/(2*
c), Int[F^(a + b*x + c*x^2), x], x] /; FreeQ[{F, a, b, c, d, e}, x] && NeQ[
b*e - 2*c*d, 0]
```

Rule 2244

```
Int[(F_)^(v_)*(u_)^(m_.), x_Symbol] :> Int[ExpandToSum[u, x]^m*F^ExpandToSu
m[v, x], x] /; FreeQ[{F, m}, x] && LinearQ[u, x] && QuadraticQ[v, x] &&  !(
LinearMatchQ[u, x] && QuadraticMatchQ[v, x])
```

Rubi steps

$$\begin{aligned}\int e^{(a+bx)(c+dx)}x\,dx &= \int e^{ac+(bc+ad)x+bdx^2}x\,dx\\ &= \frac{e^{ac+(bc+ad)x+bdx^2}}{2bd}-\frac{(bc+ad)\int e^{ac+(bc+ad)x+bdx^2}\,dx}{2bd}\\ &= \frac{e^{ac+(bc+ad)x+bdx^2}}{2bd}-\frac{\left((bc+ad)e^{-\frac{(bc-ad)^2}{4bd}}\right)\int e^{\frac{(bc+ad+2bdx)^2}{4bd}}\,dx}{2bd}\\ &= \frac{e^{ac+(bc+ad)x+bdx^2}}{2bd}-\frac{(bc+ad)e^{-\frac{(bc-ad)^2}{4bd}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{bc+ad+2bdx}{2\sqrt{b}\sqrt{d}}\right)}{4b^{3/2}d^{3/2}}\end{aligned}$$

Mathematica [A] time = 0.09, size = 116, normalized size = 1.08

$$\frac{e^{-\frac{(bc-ad)^2}{4bd}}\left(2\sqrt{b}\sqrt{d}\,e^{\frac{(ad+b(c+2dx))^2}{4bd}}-\sqrt{\pi}\,(ad+bc)\mathrm{erfi}\left(\frac{ad+b(c+2dx)}{2\sqrt{b}\sqrt{d}}\right)\right)}{4b^{3/2}d^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^((a + b*x)*(c + d*x))*x,x]
```

```
[Out] (2*Sqrt[b]*Sqrt[d]*E^((a*d + b*(c + 2*d*x))^2/(4*b*d)) - (b*c + a*d)*Sqrt[P
i]*Erfi[(a*d + b*(c + 2*d*x))/(2*Sqrt[b]*Sqrt[d])])/(4*b^(3/2)*d^(3/2)*E^((
b*c - a*d)^2/(4*b*d)))
```

fricas [A] time = 0.41, size = 107, normalized size = 1.00

$$\frac{\sqrt{\pi}\,(bc+ad)\sqrt{-bd}\,\mathrm{erf}\left(\frac{(2\,bdx+bc+ad)\sqrt{-bd}}{2\,bd}\right)e^{\left(-\frac{b^2c^2-2\,abcd+a^2d^2}{4\,bd}\right)}+2\,bde^{\left(bdx^2+ac+(bc+ad)x\right)}}{4\,b^2d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)*(d*x+c))*x,x, algorithm="fricas")
```

```
[Out] 1/4*(sqrt(pi)*(b*c + a*d)*sqrt(-b*d)*erf(1/2*(2*b*d*x + b*c + a*d)*sqrt(-b*
d)/(b*d))*e^(-1/4*(b^2*c^2 - 2*a*b*c*d + a^2*d^2)/(b*d)) + 2*b*d*e^(b*d*x^2
 + a*c + (b*c + a*d)*x))/(b^2*d^2)
```

giac [A] time = 0.42, size = 104, normalized size = 0.97

$$\frac{\frac{\sqrt{\pi}\,(bc+ad)\,\mathrm{erf}\left(-\frac{1}{2}\,\sqrt{-bd}\left(2\,x+\frac{bc+ad}{bd}\right)\right)e^{\left(-\frac{b^2c^2-2\,abcd+a^2d^2}{4\,bd}\right)}}{\sqrt{-bd}}+2\,e^{\left(bdx^2+bcx+adx+ac\right)}}{4\,bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)*(d*x+c))*x,x, algorithm="giac")
```

```
[Out] 1/4*(sqrt(pi)*(b*c + a*d)*erf(-1/2*sqrt(-b*d)*(2*x + (b*c + a*d)/(b*d)))*e^
(-1/4*(b^2*c^2 - 2*a*b*c*d + a^2*d^2)/(b*d))/sqrt(-b*d) + 2*e^(b*d*x^2 + b*
c*x + a*d*x + a*c))/(b*d)
```

maple [A] time = 0.02, size = 102, normalized size = 0.95

$$\frac{(ad+bc)\sqrt{\pi}\;\mathrm{erf}\left(-\sqrt{-bd}\;x+\frac{ad+bc}{2\sqrt{-bd}}\right)\mathrm{e}^{ac-\frac{(ad+bc)^2}{4bd}}}{4\sqrt{-bd}\;bd}+\frac{\mathrm{e}^{bd\,x^2+ac+(ad+bc)x}}{2bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp((b*x+a)*(d*x+c))*x,x)
```

```
[Out] 1/2/b/d*exp(b*d*x^2+a*c+(a*d+b*c)*x)+1/4*(a*d+b*c)/b/d*Pi^(1/2)*exp(a*c-1/4
*(a*d+b*c)^2/b/d)/(-b*d)^(1/2)*erf(-(-b*d)^(1/2)*x+1/2*(a*d+b*c)/(-b*d)^(1/
2))
```

maxima [A] time = 1.38, size = 143, normalized size = 1.34

$$-\frac{\left(\frac{\sqrt{\pi}\,(2\,bdx+bc+ad)(bc+ad)\left(\mathrm{erf}\left(\frac{1}{2}\,\sqrt{-\frac{(2\,bdx+bc+ad)^2}{bd}}\right)-1\right)}{(bd)^{\frac{3}{2}}\sqrt{-\frac{(2\,bdx+bc+ad)^2}{bd}}}-\frac{2\,bde^{\left(\frac{(2\,bdx+bc+ad)^2}{4\,bd}\right)}}{(bd)^{\frac{3}{2}}}\right)e^{\left(ac-\frac{(bc+ad)^2}{4\,bd}\right)}}{4\,\sqrt{bd}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)*(d*x+c))*x,x, algorithm="maxima")
```

```
[Out] -1/4*(sqrt(pi)*(2*b*d*x + b*c + a*d)*(b*c + a*d)*(erf(1/2*sqrt(-(2*b*d*x +
b*c + a*d)^2/(b*d))) - 1)/((b*d)^(3/2)*sqrt(-(2*b*d*x + b*c + a*d)^2/(b*d))
```

```
) - 2*b*d*e^(1/4*(2*b*d*x + b*c + a*d)^2/(b*d))/(b*d)^(3/2))*e^(a*c - 1/4*(
b*c + a*d)^2/(b*d))/sqrt(b*d)
```

mupad [B] time = 3.67, size = 95, normalized size = 0.89

$$\frac{e^{ac+adx+bcx+bdx^2}}{2bd} - \frac{\sqrt{\pi}\, e^{\frac{ac}{2}-\frac{a^2d}{4b}-\frac{bc^2}{4d}} \operatorname{erfi}\left(\frac{\frac{ad}{2}+\frac{bc}{2}+bdx}{\sqrt{bd}}\right)(ad+bc)}{4bd\sqrt{bd}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*exp((a + b*x)*(c + d*x)),x)
```

```
[Out] exp(a*c + a*d*x + b*c*x + b*d*x^2)/(2*b*d) - (pi^(1/2)*exp((a*c)/2 - (a^2*d
)/(4*b) - (b*c^2)/(4*d))*erfi(((a*d)/2 + (b*c)/2 + b*d*x)/(b*d)^(1/2))*(a*d
 + b*c))/(4*b*d*(b*d)^(1/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$e^{ac} \int xe^{adx}e^{bcx}e^{bdx^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)*(d*x+c))*x,x)
```

```
[Out] exp(a*c)*Integral(x*exp(a*d*x)*exp(b*c*x)*exp(b*d*x**2), x)
```

3.441 $\int e^{(a+bx)(c+dx)}\,dx$

Optimal. Leaf size=68

$$\frac{\sqrt{\pi}\,e^{-\frac{(bc-ad)^2}{4bd}}\operatorname{erfi}\left(\frac{ad+bc+2bdx}{2\sqrt{b}\,\sqrt{d}}\right)}{2\sqrt{b}\,\sqrt{d}}$$

```
[Out] 1/2*erfi(1/2*(2*b*d*x+a*d+b*c)/b^(1/2)/d^(1/2))*Pi^(1/2)/exp(1/4*(-a*d+b*c)
^2/b/d)/b^(1/2)/d^(1/2)
```

Rubi [A] time = 0.03, antiderivative size = 68, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231, Rules used = {2235, 2234, 2204}

$$\frac{\sqrt{\pi}\,e^{-\frac{(bc-ad)^2}{4bd}}\operatorname{Erfi}\left(\frac{ad+bc+2bdx}{2\sqrt{b}\,\sqrt{d}}\right)}{2\sqrt{b}\,\sqrt{d}}$$

Antiderivative was successfully verified.

```
[In] Int[E^((a + b*x)*(c + d*x)),x]
```

```
[Out] (Sqrt[Pi]*Erfi[(b*c + a*d + 2*b*d*x)/(2*Sqrt[b]*Sqrt[d])])/(2*Sqrt[b]*Sqrt[
d]*E^((b*c - a*d)^2/(4*b*d)))
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2234

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2235

```
Int[(F_)^(v_), x_Symbol] :> Int[F^ExpandToSum[v, x], x] /; FreeQ[F, x] && Q
uadraticQ[v, x] && !QuadraticMatchQ[v, x]
```

Rubi steps

$$\int e^{(a+bx)(c+dx)}\,dx = \int e^{ac+(bc+ad)x+bdx^2}\,dx$$
$$= e^{-\frac{(bc-ad)^2}{4bd}} \int e^{\frac{(bc+ad+2bdx)^2}{4bd}}\,dx$$
$$= \frac{e^{-\frac{(bc-ad)^2}{4bd}}\sqrt{\pi}\,\text{erfi}\left(\frac{bc+ad+2bdx}{2\sqrt{b}\sqrt{d}}\right)}{2\sqrt{b}\sqrt{d}}$$

Mathematica [A] time = 0.02, size = 68, normalized size = 1.00

$$\frac{\sqrt{\pi}\,e^{-\frac{(bc-ad)^2}{4bd}}\,\text{erfi}\left(\frac{ad+b(c+2dx)}{2\sqrt{b}\sqrt{d}}\right)}{2\sqrt{b}\sqrt{d}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^((a + b*x)*(c + d*x)),x]
```

```
[Out] (Sqrt[Pi]*Erfi[(a*d + b*(c + 2*d*x))/(2*Sqrt[b]*Sqrt[d])])/(2*Sqrt[b]*Sqrt[
d]*E^((b*c - a*d)^2/(4*b*d)))
```

fricas [A] time = 0.40, size = 74, normalized size = 1.09

$$-\frac{\sqrt{\pi}\sqrt{-bd}\,\text{erf}\left(\frac{(2\,bdx+bc+ad)\sqrt{-bd}}{2\,bd}\right)e^{\left(-\frac{b^2c^2-2\,abcd+a^2d^2}{4\,bd}\right)}}{2\,bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)*(d*x+c)),x, algorithm="fricas")
```

```
[Out] -1/2*sqrt(pi)*sqrt(-b*d)*erf(1/2*(2*b*d*x + b*c + a*d)*sqrt(-b*d)/(b*d))*e^
(-1/4*(b^2*c^2 - 2*a*b*c*d + a^2*d^2)/(b*d))/(b*d)
```

giac [A] time = 0.33, size = 68, normalized size = 1.00

$$-\frac{\sqrt{\pi}\,\text{erf}\left(-\frac{1}{2}\sqrt{-bd}\left(2\,x+\frac{bc+ad}{bd}\right)\right)e^{\left(-\frac{b^2c^2-2\,abcd+a^2d^2}{4\,bd}\right)}}{2\sqrt{-bd}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)*(d*x+c)),x, algorithm="giac")
```

```
[Out] -1/2*sqrt(pi)*erf(-1/2*sqrt(-b*d)*(2*x + (b*c + a*d)/(b*d)))*e^(-1/4*(b^2*c
^2 - 2*a*b*c*d + a^2*d^2)/(b*d))/sqrt(-b*d)
```

maple [A] time = 0.01, size = 60, normalized size = 0.88

$$-\frac{\sqrt{\pi}\,\operatorname{erf}\left(-\sqrt{-bd}\,x+\frac{ad+bc}{2\sqrt{-bd}}\right)\mathrm{e}^{ac-\frac{(ad+bc)^2}{4bd}}}{2\sqrt{-bd}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp((b*x+a)*(d*x+c)),x)
```

```
[Out] -1/2*Pi^(1/2)*exp(a*c-1/4*(a*d+b*c)^2/b/d)/(-b*d)^(1/2)*erf(-(-b*d)^(1/2)*x
+1/2*(a*d+b*c)/(-b*d)^(1/2))
```

maxima [A] time = 0.85, size = 58, normalized size = 0.85

$$\frac{\sqrt{\pi}\,\operatorname{erf}\left(\sqrt{-bd}\,x-\frac{bc+ad}{2\,\sqrt{-bd}}\right)e^{\left(ac-\frac{(bc+ad)^2}{4\,bd}\right)}}{2\,\sqrt{-bd}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)*(d*x+c)),x, algorithm="maxima")
```

```
[Out] 1/2*sqrt(pi)*erf(sqrt(-b*d)*x - 1/2*(b*c + a*d)/sqrt(-b*d))*e^(a*c - 1/4*(b
*c + a*d)^2/(b*d))/sqrt(-b*d)
```

mupad [B] time = 0.04, size = 60, normalized size = 0.88

$$-\frac{\sqrt{\pi}\,\mathrm{e}^{\frac{a\,c}{2}-\frac{a^2\,d}{4\,b}-\frac{b\,c^2}{4\,d}}\,\operatorname{erf}\left(\frac{a\,d\,1\mathrm{i}+b\,c\,1\mathrm{i}+b\,d\,x\,2\mathrm{i}}{2\,\sqrt{b\,d}}\right)1\mathrm{i}}{2\,\sqrt{b\,d}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp((a + b*x)*(c + d*x)),x)
```

```
[Out] -(pi^(1/2)*exp((a*c)/2 - (a^2*d)/(4*b) - (b*c^2)/(4*d))*erf((a*d*1i + b*c*1
i + b*d*x*2i)/(2*(b*d)^(1/2)))*1i)/(2*(b*d)^(1/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$e^{ac}\int e^{adx}e^{bcx}e^{bdx^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)*(d*x+c)),x)
```

```
[Out] exp(a*c)*Integral(exp(a*d*x)*exp(b*c*x)*exp(b*d*x**2), x)
```

3.442 $\int \frac{e^{(a+bx)(c+dx)}}{x} \, dx$

Optimal. Leaf size=28

$$\text{Int}\left(\frac{e^{x(ad+bc)+ac+bdx^2}}{x},x\right)$$

```
[Out] Unintegrable(exp(a*c+(a*d+b*c)*x+b*d*x^2)/x,x)
```

Rubi [A] time = 0.14, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{e^{(a+bx)(c+dx)}}{x} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[E^((a + b*x)*(c + d*x))/x,x]
```

```
[Out] Defer[Int][E^(a*c + (b*c + a*d)*x + b*d*x^2)/x, x]
```

Rubi steps

$$\int \frac{e^{(a+bx)(c+dx)}}{x} \, dx = \int \frac{e^{ac+(bc+ad)x+bdx^2}}{x} \, dx$$

Mathematica [A] time = 0.56, size = 0, normalized size = 0.00

$$\int \frac{e^{(a+bx)(c+dx)}}{x} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[E^((a + b*x)*(c + d*x))/x,x]
```

```
[Out] Integrate[E^((a + b*x)*(c + d*x))/x, x]
```

fricas [A] time = 0.39, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{e^{\left(bdx^2+ac+(bc+ad)x\right)}}{x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)*(d*x+c))/x,x, algorithm="fricas")
```

```
[Out] integral(e^(b*d*x^2 + a*c + (b*c + a*d)*x)/x, x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{((bx+a)(dx+c))}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)*(d*x+c))/x,x, algorithm="giac")
```

```
[Out] integrate(e^((b*x + a)*(d*x + c))/x, x)
```

maple [A] time = 0.03, size = 0, normalized size = 0.00

$$\int \frac{\mathrm{e}^{(bx+a)(dx+c)}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp((b*x+a)*(d*x+c))/x,x)
```

```
[Out] int(exp((b*x+a)*(d*x+c))/x,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{((bx+a)(dx+c))}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)*(d*x+c))/x,x, algorithm="maxima")
```

```
[Out] integrate(e^((b*x + a)*(d*x + c))/x, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\mathrm{e}^{(a+b\,x)\,(c+d\,x)}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp((a + b*x)*(c + d*x))/x,x)
```

```
[Out] int(exp((a + b*x)*(c + d*x))/x, x)
```

sympy [**A**] time = 0.00, size = 0, normalized size = 0.00

$$e^{ac} \int \frac{e^{adx} e^{bcx} e^{bdx^2}}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)*(d*x+c))/x,x)
```

```
[Out] exp(a*c)*Integral(exp(a*d*x)*exp(b*c*x)*exp(b*d*x**2)/x, x)
```

3.443 $\int \frac{e^{(a+bx)(c+dx)}}{x^2} dx$

Optimal. Leaf size=128

$$(ad+bc)\mathrm{Int}\left(\frac{e^{x(ad+bc)+ac+bdx^2}}{x},x\right)+\sqrt{\pi}\sqrt{b}\sqrt{d}\,e^{-\frac{(bc-ad)^2}{4bd}}\,\mathrm{erfi}\left(\frac{ad+bc+2bdx}{2\sqrt{b}\sqrt{d}}\right)-\frac{e^{x(ad+bc)+ac+bdx^2}}{x}$$

```
[Out] -exp(a*c+(a*d+b*c)*x+b*d*x^2)/x+erfi(1/2*(2*b*d*x+a*d+b*c)/b^(1/2)/d^(1/2))
*b^(1/2)*d^(1/2)*Pi^(1/2)/exp(1/4*(-a*d+b*c)^2/b/d)+(a*d+b*c)*Unintegrable(
exp(a*c+(a*d+b*c)*x+b*d*x^2)/x,x)
```

Rubi [A] time = 0.26, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{e^{(a+bx)(c+dx)}}{x^2} dx$$

Verification is Not applicable to the result.

```
[In] Int[E^((a + b*x)*(c + d*x))/x^2,x]
```

```
[Out] -(E^(a*c + (b*c + a*d)*x + b*d*x^2)/x) + (Sqrt[b]*Sqrt[d]*Sqrt[Pi]*Erfi[(b*
c + a*d + 2*b*d*x)/(2*Sqrt[b]*Sqrt[d])])/E^((b*c - a*d)^2/(4*b*d)) + (b*c +
 a*d)*Defer[Int][E^(a*c + (b*c + a*d)*x + b*d*x^2)/x, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{e^{(a+bx)(c+dx)}}{x^2} dx &= \int \frac{e^{ac+(bc+ad)x+bdx^2}}{x^2} dx \\
&= -\frac{e^{ac+(bc+ad)x+bdx^2}}{x}+(2bd)\int e^{ac+(bc+ad)x+bdx^2}\,dx-(-bc-ad)\int \frac{e^{ac+(bc+ad)x+bdx^2}}{x} dx \\
&= -\frac{e^{ac+(bc+ad)x+bdx^2}}{x}-(-bc-ad)\int \frac{e^{ac+(bc+ad)x+bdx^2}}{x} dx+\left(2bde^{-\frac{(bc-ad)^2}{4bd}}\right)\int e^{\frac{(bc+ad+2bdx)^2}{4bd}} dx \\
&= -\frac{e^{ac+(bc+ad)x+bdx^2}}{x}+\sqrt{b}\sqrt{d}\,e^{-\frac{(bc-ad)^2}{4bd}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{bc+ad+2bdx}{2\sqrt{b}\sqrt{d}}\right)-(-bc-ad)\int \frac{e^{ac+(bc+ad)x+bd}}{x}
\end{aligned}$$

Mathematica [A] time = 0.38, size = 0, normalized size = 0.00

$$\int \frac{e^{(a+bx)(c+dx)}}{x^2} dx$$

Verification is Not applicable to the result.

[In] Integrate[E^((a + b*x)*(c + d*x))/x^2,x]

[Out] Integrate[E^((a + b*x)*(c + d*x))/x^2, x]

fricas [**A**] time = 0.39, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{e^{\left(bdx^2+ac+(bc+ad)x\right)}}{x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(exp((b*x+a)*(d*x+c))/x^2,x, algorithm="fricas")

[Out] integral(e^(b*d*x^2 + a*c + (b*c + a*d)*x)/x^2, x)

giac [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{((bx+a)(dx+c))}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(exp((b*x+a)*(d*x+c))/x^2,x, algorithm="giac")

[Out] integrate(e^((b*x + a)*(d*x + c))/x^2, x)

maple [**A**] time = 0.03, size = 0, normalized size = 0.00

$$\int \frac{\mathrm{e}^{(bx+a)(dx+c)}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(exp((b*x+a)*(d*x+c))/x^2,x)

[Out] int(exp((b*x+a)*(d*x+c))/x^2,x)

maxima [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{((bx+a)(dx+c))}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(exp((b*x+a)*(d*x+c))/x^2,x, algorithm="maxima")

```
[Out] integrate(e^((b*x + a)*(d*x + c))/x^2, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{e}^{(a+b\,x)\,(c+d\,x)}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp((a + b*x)*(c + d*x))/x^2,x)
```

```
[Out] int(exp((a + b*x)*(c + d*x))/x^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$e^{ac} \int \frac{e^{adx}e^{bcx}e^{bdx^2}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)*(d*x+c))/x**2,x)
```

```
[Out] exp(a*c)*Integral(exp(a*d*x)*exp(b*c*x)*exp(b*d*x**2)/x**2, x)
```

3.444 $\int f^{a+bx+cx^2}(d+ex)^3\,dx$

Optimal. Leaf size=266

$$-\frac{3\sqrt{\pi}\,e^2 f^{a-\frac{b^2}{4c}}(2cd-be)\operatorname{erfi}\left(\frac{\sqrt{\log(f)}\,(b+2cx)}{2\sqrt{c}}\right)}{8c^{5/2}\log^{\frac{3}{2}}(f)}+\frac{\sqrt{\pi}\,f^{a-\frac{b^2}{4c}}(2cd-be)^3\operatorname{erfi}\left(\frac{\sqrt{\log(f)}\,(b+2cx)}{2\sqrt{c}}\right)}{16c^{7/2}\sqrt{\log(f)}}+\frac{e(2cd-be)^2 f^{a+bx+cx^2}}{8c^3\log(f)}+\frac{e(\dots}{}$$

```
[Out] -1/2*e^3*f^(c*x^2+b*x+a)/c^2/ln(f)^2+1/8*e*(-b*e+2*c*d)^2*f^(c*x^2+b*x+a)/c
^3/ln(f)+1/4*e*(-b*e+2*c*d)*f^(c*x^2+b*x+a)*(e*x+d)/c^2/ln(f)+1/2*e*f^(c*x^
2+b*x+a)*(e*x+d)^2/c/ln(f)-3/8*e^2*(-b*e+2*c*d)*f^(a-1/4/c*b^2)*erfi(1/2*(2
*c*x+b)*ln(f)^(1/2)/c^(1/2))*Pi^(1/2)/c^(5/2)/ln(f)^(3/2)+1/16*(-b*e+2*c*d)
^3*f^(a-1/4/c*b^2)*erfi(1/2*(2*c*x+b)*ln(f)^(1/2)/c^(1/2))*Pi^(1/2)/c^(7/2)
/ln(f)^(1/2)
```

Rubi [A] time = 0.32, antiderivative size = 266, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 4, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2241, 2240, 2234, 2204}

$$-\frac{3\sqrt{\pi}\,e^2 f^{a-\frac{b^2}{4c}}(2cd-be)\operatorname{Erfi}\left(\frac{\sqrt{\log(f)}\,(b+2cx)}{2\sqrt{c}}\right)}{8c^{5/2}\log^{\frac{3}{2}}(f)}+\frac{\sqrt{\pi}\,f^{a-\frac{b^2}{4c}}(2cd-be)^3\operatorname{Erfi}\left(\frac{\sqrt{\log(f)}\,(b+2cx)}{2\sqrt{c}}\right)}{16c^{7/2}\sqrt{\log(f)}}+\frac{e(2cd-be)^2 f^{a+bx+cx^2}}{8c^3\log(f)}+\frac{e(\dots}{}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x + c*x^2)*(d + e*x)^3,x]
```

```
[Out] -(e^3*f^(a + b*x + c*x^2))/(2*c^2*Log[f]^2) - (3*e^2*(2*c*d - b*e)*f^(a - b
^2/(4*c))*Sqrt[Pi]*Erfi[((b + 2*c*x)*Sqrt[Log[f]])/(2*Sqrt[c])])/(8*c^(5/2)
*Log[f]^(3/2)) + (e*(2*c*d - b*e)^2*f^(a + b*x + c*x^2))/(8*c^3*Log[f]) + (
e*(2*c*d - b*e)*f^(a + b*x + c*x^2)*(d + e*x))/(4*c^2*Log[f]) + (e*f^(a + b
*x + c*x^2)*(d + e*x)^2)/(2*c*Log[f]) + ((2*c*d - b*e)^3*f^(a - b^2/(4*c))*
Sqrt[Pi]*Erfi[((b + 2*c*x)*Sqrt[Log[f]])/(2*Sqrt[c])])/(16*c^(7/2)*Sqrt[Log
[f]])
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2234

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_)), x_Symbol
] :> Simp[(e*F^(a + b*x + c*x^2))/(2*c*Log[F]), x] - Dist[(b*e - 2*c*d)/(2*
c), Int[F^(a + b*x + c*x^2), x], x] /; FreeQ[{F, a, b, c, d, e}, x] && NeQ[
b*e - 2*c*d, 0]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_))^(m_), x_S
ymbol] :> Simp[(e*(d + e*x)^(m - 1)*F^(a + b*x + c*x^2))/(2*c*Log[F]), x] +
 (-Dist[(b*e - 2*c*d)/(2*c), Int[(d + e*x)^(m - 1)*F^(a + b*x + c*x^2), x],
 x] - Dist[((m - 1)*e^2)/(2*c*Log[F]), Int[(d + e*x)^(m - 2)*F^(a + b*x + c
*x^2), x], x]) /; FreeQ[{F, a, b, c, d, e}, x] && NeQ[b*e - 2*c*d, 0] && Gt
Q[m, 1]
```

Rubi steps

$$
\begin{aligned}
\int f^{a+bx+cx^2}(d+ex)^3\,dx &= \frac{ef^{a+bx+cx^2}(d+ex)^2}{2c\log(f)} - \frac{(-2cd+be)\int f^{a+bx+cx^2}(d+ex)^2\,dx}{2c} - \frac{e^2\int f^{a+bx+cx^2}(d+ex)\,dx}{c\log(f)} \\
&= -\frac{e^3 f^{a+bx+cx^2}}{2c^2\log^2(f)} + \frac{e(2cd-be)f^{a+bx+cx^2}(d+ex)}{4c^2\log(f)} + \frac{ef^{a+bx+cx^2}(d+ex)^2}{2c\log(f)} + \frac{(2cd-be)^2\int f}{} \\
&= -\frac{e^3 f^{a+bx+cx^2}}{2c^2\log^2(f)} + \frac{e(2cd-be)^2 f^{a+bx+cx^2}}{8c^3\log(f)} + \frac{e(2cd-be)f^{a+bx+cx^2}(d+ex)}{4c^2\log(f)} + \frac{ef^{a+bx+cx^2}(d}{2c\log(f} \\
&= -\frac{e^3 f^{a+bx+cx^2}}{2c^2\log^2(f)} - \frac{3e^2(2cd-be)f^{a-\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)}{8c^{5/2}\log^{\frac{3}{2}}(f)} + \frac{e(2cd-be)^2 f^{a+bx+cx^2}}{8c^3\log(f)} + \\
&= -\frac{e^3 f^{a+bx+cx^2}}{2c^2\log^2(f)} - \frac{3e^2(2cd-be)f^{a-\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)}{8c^{5/2}\log^{\frac{3}{2}}(f)} + \frac{e(2cd-be)^2 f^{a+bx+cx^2}}{8c^3\log(f)} +
\end{aligned}
$$

Mathematica [A] time = 0.29, size = 169, normalized size = 0.64

$$
\frac{f^{a-\frac{b^2}{4c}}\left(2\sqrt{c}\,ef^{\frac{(b+2cx)^2}{4c}}\left(\log(f)\left(b^2e^2-2bce(3d+ex)+4c^2\left(3d^2+3dex+e^2x^2\right)\right)-4ce^2\right)+\sqrt{\pi}\sqrt{\log(f)}\,(2cd-be)\right.}{16c^{7/2}\log^2(f)}
$$

Antiderivative was successfully verified.

[In] Integrate[f^(a + b*x + c*x^2)*(d + e*x)^3,x]

[Out] (f^(a - b^2/(4*c))*((2*c*d - b*e)*Sqrt[Pi]*Erfi[((b + 2*c*x)*Sqrt[Log[f]])/(2*Sqrt[c])]*Sqrt[Log[f]]*(-6*c*e^2 + (-2*c*d + b*e)^2*Log[f]) + 2*Sqrt[c]*e*f^((b + 2*c*x)^2/(4*c))*(-4*c*e^2 + (b^2*e^2 - 2*b*c*e*(3*d + e*x) + 4*c^2*(3*d^2 + 3*d*e*x + e^2*x^2))*Log[f])))/(16*c^(7/2)*Log[f]^2)

fricas [A] time = 0.42, size = 204, normalized size = 0.77

$$-\frac{2\left(4c^2e^3-\left(4c^3e^3x^2+12c^3d^2e-6bc^2de^2+b^2ce^3+2\left(6c^3de^2-bc^2e^3\right)x\right)\log(f)\right)f^{cx^2+bx+a}-\frac{\sqrt{\pi}\left(12c^2de^2-6bce^3-(8\cdots\right.}{\cdots}}{16c^4\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f^(c*x^2+b*x+a)*(e*x+d)^3,x, algorithm="fricas")

[Out] -1/16*(2*(4*c^2*e^3 - (4*c^3*e^3*x^2 + 12*c^3*d^2*e - 6*b*c^2*d*e^2 + b^2*c*e^3 + 2*(6*c^3*d*e^2 - b*c^2*e^3)*x)*log(f))*f^(c*x^2 + b*x + a) - sqrt(pi)*(12*c^2*d*e^2 - 6*b*c*e^3 - (8*c^3*d^3 - 12*b*c^2*d^2*e + 6*b^2*c*d*e^2 - b^3*e^3)*log(f))*sqrt(-c*log(f))*erf(1/2*(2*c*x + b)*sqrt(-c*log(f))/c)/f^(1/4*(b^2 - 4*a*c)/c))/(c^4*log(f)^2)

giac [A] time = 0.54, size = 401, normalized size = 1.51

$$-\frac{\sqrt{\pi}d^3\operatorname{erf}\left(-\frac{1}{2}\sqrt{-c\log(f)}\left(2x+\frac{b}{c}\right)\right)e^{\left(-\frac{b^2\log(f)-4ac\log(f)}{4c}\right)}}{2\sqrt{-c\log(f)}}+\frac{3\left(\frac{\sqrt{\pi}bd^2\operatorname{erf}\left(-\frac{1}{2}\sqrt{-c\log(f)}\left(2x+\frac{b}{c}\right)\right)e^{\left(-\frac{b^2\log(f)-4ac\log(f)-4c}{4c}\right)}}{\sqrt{-c\log(f)}}+\frac{2d\cdots}{\cdots}\right.}{4c}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f^(c*x^2+b*x+a)*(e*x+d)^3,x, algorithm="giac")

[Out] -1/2*sqrt(pi)*d^3*erf(-1/2*sqrt(-c*log(f))*(2*x + b/c))*e^(-1/4*(b^2*log(f) - 4*a*c*log(f))/c)/sqrt(-c*log(f)) + 3/4*(sqrt(pi)*b*d^2*erf(-1/2*sqrt(-c*log(f))*(2*x + b/c))*e^(-1/4*(b^2*log(f) - 4*a*c*log(f) - 4*c)/c)/sqrt(-c*log(f)) + 2*d^2*e^(c*x^2*log(f) + b*x*log(f) + a*log(f) + 1)/log(f))/c - 3/8*(sqrt(pi)*(b^2*d*log(f) - 2*c*d)*erf(-1/2*sqrt(-c*log(f))*(2*x + b/c))*e^(-1/4*(b^2*log(f) - 4*a*c*log(f) - 8*c)/c)/(sqrt(-c*log(f))*log(f)) - 2*(c*d*(2*x + b/c) - 2*b*d)*e^(c*x^2*log(f) + b*x*log(f) + a*log(f) + 2)/log(f))/c^2 + 1/16*(sqrt(pi)*(b^3*log(f) - 6*b*c)*erf(-1/2*sqrt(-c*log(f))*(2*x + b/c))*e^(-1/4*(b^2*log(f) - 4*a*c*log(f) - 12*c)/c)/(sqrt(-c*log(f))*log(f)) + 2*(c^2*(2*x + b/c)^2*log(f) - 3*b*c*(2*x + b/c)*log(f) + 3*b^2*log(f) - 4*c)*e^(c*x^2*log(f) + b*x*log(f) + a*log(f) + 3)/log(f)^2)/c^3

maple [B] time = 0.08, size = 550, normalized size = 2.07

$$\frac{\sqrt{\pi}\, b^{3} e^{3} f^{a} f^{-\frac{b^{2}}{4c}} \operatorname{erf}\left(\frac{b\ln(f)}{2\sqrt{-c\ln(f)}}-\sqrt{-c\ln(f)}\, x\right)}{16\sqrt{-c\ln(f)}\, c^{3}}-\frac{3\sqrt{\pi}\, b^{2} d\, e^{2} f^{a} f^{-\frac{b^{2}}{4c}} \operatorname{erf}\left(\frac{b\ln(f)}{2\sqrt{-c\ln(f)}}-\sqrt{-c\ln(f)}\, x\right)}{8\sqrt{-c\ln(f)}\, c^{2}}+\frac{3\sqrt{\pi}\, b\, d^{2} e\, f^{a}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*x^2+b*x+a)*(e*x+d)^3,x)
```

```
[Out] -1/2*d^3*Pi^(1/2)*f^a*f^(-1/4*b^2/c)/(-c*ln(f))^(1/2)*erf(1/2/(-c*ln(f))^(1
/2)*b*ln(f)-(-c*ln(f))^(1/2)*x)+1/2*e^3/c*x^2*f^a*f^(b*x)*f^(c*x^2)/ln(f)-1
/4*e^3*b/c^2*x*f^a*f^(b*x)*f^(c*x^2)/ln(f)+1/8*e^3*b^2/c^3/ln(f)*f^(c*x^2)*
f^(b*x)*f^a+1/16*e^3*b^3/c^3*Pi^(1/2)*f^a*f^(-1/4*b^2/c)/(-c*ln(f))^(1/2)*e
rf(1/2/(-c*ln(f))^(1/2)*b*ln(f)-(-c*ln(f))^(1/2)*x)-3/8*e^3*b/c^2/ln(f)*Pi^
(1/2)*f^a*f^(-1/4*b^2/c)/(-c*ln(f))^(1/2)*erf(1/2/(-c*ln(f))^(1/2)*b*ln(f)-
(-c*ln(f))^(1/2)*x)-1/2*e^3/c^2/ln(f)^2*f^(c*x^2)*f^(b*x)*f^a+3/2*d*e^2/c*x
*f^a*f^(b*x)*f^(c*x^2)/ln(f)-3/4*d*e^2*b/c^2/ln(f)*f^(c*x^2)*f^(b*x)*f^a-3/
8*d*e^2*b^2/c^2*Pi^(1/2)*f^a*f^(-1/4*b^2/c)/(-c*ln(f))^(1/2)*erf(1/2/(-c*ln
(f))^(1/2)*b*ln(f)-(-c*ln(f))^(1/2)*x)+3/4*d*e^2/c/ln(f)*Pi^(1/2)*f^a*f^(-1
/4*b^2/c)/(-c*ln(f))^(1/2)*erf(1/2/(-c*ln(f))^(1/2)*b*ln(f)-(-c*ln(f))^(1/2
)*x)+3/2*e*d^2/c/ln(f)*f^(c*x^2)*f^(b*x)*f^a+3/4*e*d^2*b/c*Pi^(1/2)*f^a*f^(
-1/4*b^2/c)/(-c*ln(f))^(1/2)*erf(1/2/(-c*ln(f))^(1/2)*b*ln(f)-(-c*ln(f))^(1
/2)*x)
```

maxima [B] time = 2.71, size = 539, normalized size = 2.03

$$-\frac{3\left(\frac{\sqrt{\pi}\,(2\,cx+b)b\left(\operatorname{erf}\left(\frac{1}{2}\sqrt{-\frac{(2\,cx+b)^{2}\log(f)}{c}}\right)-1\right)\log(f)^{2}}{\sqrt{-\frac{(2\,cx+b)^{2}\log(f)}{c}}\left(c\log(f)\right)^{\frac{3}{2}}}-\frac{2\,cf^{\frac{(2\,cx+b)^{2}}{4\,c}}\log(f)}{\left(c\log(f)\right)^{\frac{3}{2}}}\right)d^{2}ef^{a-\frac{b^{2}}{4\,c}}}{4\sqrt{c\log(f)}}+\frac{3\left(\frac{\sqrt{\pi}\,(2\,cx+b)b^{2}\left(\operatorname{erf}\left(\frac{1}{2}\sqrt{-\frac{(2\,cx+b)^{2}\log(f)}{c}}\right)-1\right)\log}{\sqrt{-\frac{(2\,cx+b)^{2}\log(f)}{c}}\left(c\log(f)\right)^{\frac{5}{2}}}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*(e*x+d)^3,x, algorithm="maxima")
```

```
[Out] -3/4*(sqrt(pi)*(2*c*x + b)*b*(erf(1/2*sqrt(-(2*c*x + b)^2*log(f)/c)) - 1)*l
og(f)^2/(sqrt(-(2*c*x + b)^2*log(f)/c)*(c*log(f))^(3/2)) - 2*c*f^(1/4*(2*c*
x + b)^2/c)*log(f)/(c*log(f))^(3/2))*d^2*e*f^(a - 1/4*b^2/c)/sqrt(c*log(f))
 + 3/8*(sqrt(pi)*(2*c*x + b)*b^2*(erf(1/2*sqrt(-(2*c*x + b)^2*log(f)/c)) -
1)*log(f)^3/(sqrt(-(2*c*x + b)^2*log(f)/c)*(c*log(f))^(5/2)) - 4*(2*c*x + b
)^3*gamma(3/2, -1/4*(2*c*x + b)^2*log(f)/c)*log(f)^3/((-(2*c*x + b)^2*log(f
)/c)^(3/2)*(c*log(f))^(5/2)) - 4*b*c*f^(1/4*(2*c*x + b)^2/c)*log(f)^2/(c*lo
```

```
g(f))^(5/2))*d*e^2*f^(a - 1/4*b^2/c)/sqrt(c*log(f)) - 1/16*(sqrt(pi)*(2*c*x
 + b)*b^3*(erf(1/2*sqrt(-(2*c*x + b)^2*log(f)/c)) - 1)*log(f)^4/(sqrt(-(2*c
*x + b)^2*log(f)/c)*(c*log(f))^(7/2)) - 12*(2*c*x + b)^3*b*gamma(3/2, -1/4*
(2*c*x + b)^2*log(f)/c)*log(f)^4/((-(2*c*x + b)^2*log(f)/c)^(3/2)*(c*log(f)
)^(7/2)) - 6*b^2*c*f^(1/4*(2*c*x + b)^2/c)*log(f)^3/(c*log(f))^(7/2) + 8*c^
2*gamma(2, -1/4*(2*c*x + b)^2*log(f)/c)*log(f)^2/(c*log(f))^(7/2))*e^3*f^(a
 - 1/4*b^2/c)/sqrt(c*log(f)) + 1/2*sqrt(pi)*d^3*f^a*erf(sqrt(-c*log(f))*x -
 1/2*b*log(f)/sqrt(-c*log(f)))/(sqrt(-c*log(f))*f^(1/4*b^2/c))
```

mupad [B] time = 3.89, size = 251, normalized size = 0.94

$$\frac{e^3\, f^a\, f^{c\,x^2}\, f^{b\,x}\, x^2}{2\,c\,\ln(f)} - \frac{f^{a-\frac{b^2}{4\,c}}\, \sqrt{\pi}\, \mathrm{erfi}\left(\frac{\frac{b\,\ln(f)}{2}+c\,x\,\ln(f)}{\sqrt{c\,\ln(f)}}\right) \left(\frac{\ln(f)\,b^3\,e^3}{16} - \frac{3\,\ln(f)\,b^2\,c\,d\,e^2}{8} + \frac{3\,\ln(f)\,b\,c^2\,d^2\,e}{4} - \frac{3\,b\,c\,e^3}{8} - \frac{\ln(f)\,c^3\,d^3}{2} + \frac{3\,c^2}{4}\right.}{c^3\,\ln(f)\,\sqrt{c\,\ln(f)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x + c*x^2)*(d + e*x)^3,x)
```

```
[Out] (e^3*f^a*f^(c*x^2)*f^(b*x)*x^2)/(2*c*log(f)) - (f^(a - b^2/(4*c))*pi^(1/2)*
erfi(((b*log(f))/2 + c*x*log(f))/(c*log(f))^(1/2))*((3*c^2*d*e^2)/4 + (b^3*
e^3*log(f))/16 - (c^3*d^3*log(f))/2 - (3*b*c*e^3)/8 + (3*b*c^2*d^2*e*log(f)
)/4 - (3*b^2*c*d*e^2*log(f))/8))/(c^3*log(f)*(c*log(f))^(1/2)) - (f^a*f^(c*
x^2)*f^(b*x)*x*(b*e^3 - 6*c*d*e^2))/(4*c^2*log(f)) - f^a*f^(c*x^2)*f^(b*x)*
(e^3/(2*c^2*log(f)^2) - (3*d^2*e)/(2*c*log(f)) - (b^2*e^3)/(8*c^3*log(f)) +
 (3*b*d*e^2)/(4*c^2*log(f)))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+bx+cx^2}\,(d+ex)^3\;dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*x**2+b*x+a)*(e*x+d)**3,x)
```

```
[Out] Integral(f**(a + b*x + c*x**2)*(d + e*x)**3, x)
```

3.445 $\int f^{a+bx+cx^2}(d+ex)^2\,dx$

Optimal. Leaf size=189

$$\frac{\sqrt{\pi}f^{a-\frac{b^2}{4c}}(2cd-be)^2\text{erfi}\left(\frac{\sqrt{\log(f)}(b+2cx)}{2\sqrt{c}}\right)}{8c^{5/2}\sqrt{\log(f)}}-\frac{\sqrt{\pi}e^2f^{a-\frac{b^2}{4c}}\text{erfi}\left(\frac{\sqrt{\log(f)}(b+2cx)}{2\sqrt{c}}\right)}{4c^{3/2}\log^{\frac{3}{2}}(f)}+\frac{e(2cd-be)f^{a+bx+cx^2}}{4c^2\log(f)}+\frac{e(d+ex)f^{a+bx+cx^2}}{2c\log(f)}$$

```
[Out] 1/4*e*(-b*e+2*c*d)*f^(c*x^2+b*x+a)/c^2/ln(f)+1/2*e*f^(c*x^2+b*x+a)*(e*x+d)/
c/ln(f)-1/4*e^2*f^(a-1/4/c*b^2)*erfi(1/2*(2*c*x+b)*ln(f)^(1/2)/c^(1/2))*Pi^
(1/2)/c^(3/2)/ln(f)^(3/2)+1/8*(-b*e+2*c*d)^2*f^(a-1/4/c*b^2)*erfi(1/2*(2*c*
x+b)*ln(f)^(1/2)/c^(1/2))*Pi^(1/2)/c^(5/2)/ln(f)^(1/2)
```

Rubi [A] time = 0.11, antiderivative size = 189, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2241, 2240, 2234, 2204}

$$\frac{\sqrt{\pi}f^{a-\frac{b^2}{4c}}(2cd-be)^2\text{Erfi}\left(\frac{\sqrt{\log(f)}(b+2cx)}{2\sqrt{c}}\right)}{8c^{5/2}\sqrt{\log(f)}}-\frac{\sqrt{\pi}e^2f^{a-\frac{b^2}{4c}}\text{Erfi}\left(\frac{\sqrt{\log(f)}(b+2cx)}{2\sqrt{c}}\right)}{4c^{3/2}\log^{\frac{3}{2}}(f)}+\frac{e(2cd-be)f^{a+bx+cx^2}}{4c^2\log(f)}+\frac{e(d+ex)f^{a+bx+cx^2}}{2c\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x + c*x^2)*(d + e*x)^2,x]
```

```
[Out] -(e^2*f^(a - b^2/(4*c))*Sqrt[Pi]*Erfi[((b + 2*c*x)*Sqrt[Log[f]])/(2*Sqrt[c]
)])/(4*c^(3/2)*Log[f]^(3/2)) + (e*(2*c*d - b*e)*f^(a + b*x + c*x^2))/(4*c^2
*Log[f]) + (e*f^(a + b*x + c*x^2)*(d + e*x))/(2*c*Log[f]) + ((2*c*d - b*e)^
2*f^(a - b^2/(4*c))*Sqrt[Pi]*Erfi[((b + 2*c*x)*Sqrt[Log[f]])/(2*Sqrt[c])])/
(8*c^(5/2)*Sqrt[Log[f]])
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2234

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_)), x_Symbol
] :> Simp[(e*F^(a + b*x + c*x^2))/(2*c*Log[F]), x] - Dist[(b*e - 2*c*d)/(2*
c), Int[F^(a + b*x + c*x^2), x], x] /; FreeQ[{F, a, b, c, d, e}, x] && NeQ[
b*e - 2*c*d, 0]
```

Rule 2241

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_))^(m_), x_S
ymbol] :> Simp[(e*(d + e*x)^(m - 1)*F^(a + b*x + c*x^2))/(2*c*Log[F]), x] +
 (-Dist[(b*e - 2*c*d)/(2*c), Int[(d + e*x)^(m - 1)*F^(a + b*x + c*x^2), x],
 x] - Dist[((m - 1)*e^2)/(2*c*Log[F]), Int[(d + e*x)^(m - 2)*F^(a + b*x + c
*x^2), x], x]) /; FreeQ[{F, a, b, c, d, e}, x] && NeQ[b*e - 2*c*d, 0] && Gt
Q[m, 1]
```

Rubi steps

$$\int f^{a+bx+cx^2}(d+ex)^2\,dx = \frac{ef^{a+bx+cx^2}(d+ex)}{2c\log(f)} - \frac{(-2cd+be)\int f^{a+bx+cx^2}(d+ex)\,dx}{2c} - \frac{e^2\int f^{a+bx+cx^2}\,dx}{2c\log(f)}$$

$$= \frac{e(2cd-be)f^{a+bx+cx^2}}{4c^2\log(f)} + \frac{ef^{a+bx+cx^2}(d+ex)}{2c\log(f)} + \frac{(2cd-be)^2\int f^{a+bx+cx^2}\,dx}{4c^2} - \frac{\left(e^2f^{a-\frac{b^2}{4c}}\right)\int}{2c\log}$$

$$= -\frac{e^2f^{a-\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)}{4c^{3/2}\log^{\frac{3}{2}}(f)} + \frac{e(2cd-be)f^{a+bx+cx^2}}{4c^2\log(f)} + \frac{ef^{a+bx+cx^2}(d+ex)}{2c\log(f)} + \frac{\left((2cd\right.}{}$$

$$= -\frac{e^2f^{a-\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)}{4c^{3/2}\log^{\frac{3}{2}}(f)} + \frac{e(2cd-be)f^{a+bx+cx^2}}{4c^2\log(f)} + \frac{ef^{a+bx+cx^2}(d+ex)}{2c\log(f)} + \frac{(2cd-}{}$$

Mathematica [A] time = 0.19, size = 123, normalized size = 0.65

$$\frac{f^{a-\frac{b^2}{4c}}\left(\sqrt{\pi}\left(\log(f)(be-2cd)^2-2ce^2\right)\mathrm{erfi}\left(\frac{\sqrt{\log(f)}\,(b+2cx)}{2\sqrt{c}}\right)+2\sqrt{c}\,e\sqrt{\log(f)}\,f^{\frac{(b+2cx)^2}{4c}}(-be+4cd+2cex)\right)}{8c^{5/2}\log^{\frac{3}{2}}(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x + c*x^2)*(d + e*x)^2,x]
```

```
[Out] (f^(a - b^2/(4*c))*(2*Sqrt[c]*e*f^((b + 2*c*x)^2/(4*c))*(4*c*d - b*e + 2*c*
e*x)*Sqrt[Log[f]] + Sqrt[Pi]*Erfi[((b + 2*c*x)*Sqrt[Log[f]])/(2*Sqrt[c])]*(
-2*c*e^2 + (-2*c*d + b*e)^2*Log[f])))/(8*c^(5/2)*Log[f]^(3/2))
```

fricas [A] time = 0.42, size = 130, normalized size = 0.69

$$\frac{2\left(2\,c^2e^2x+4\,c^2de-bce^2\right)f^{cx^2+bx+a}\log(f)+\frac{\sqrt{\pi}\left(2\,ce^2-\left(4\,c^2d^2-4\,bcde+b^2e^2\right)\log(f)\right)\sqrt{-c\log(f)}\,\operatorname{erf}\left(\frac{(2\,cx+b)\sqrt{-c\log(f)}}{2\,c}\right)}{f^{\frac{b^2-4\,ac}{4\,c}}}}{8\,c^3\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*(e*x+d)^2,x, algorithm="fricas")
```

```
[Out] 1/8*(2*(2*c^2*e^2*x + 4*c^2*d*e - b*c*e^2)*f^(c*x^2 + b*x + a)*log(f) + sqr
t(pi)*(2*c*e^2 - (4*c^2*d^2 - 4*b*c*d*e + b^2*e^2)*log(f))*sqrt(-c*log(f))*
erf(1/2*(2*c*x + b)*sqrt(-c*log(f))/c)/f^(1/4*(b^2 - 4*a*c)/c))/(c^3*log(f)
^2)
```

giac [A] time = 0.40, size = 252, normalized size = 1.33

$$-\frac{\sqrt{\pi}\,d^2\operatorname{erf}\left(-\frac{1}{2}\sqrt{-c\log(f)}\left(2\,x+\frac{b}{c}\right)\right)e^{\left(-\frac{b^2\log(f)-4\,ac\log(f)}{4\,c}\right)}}{2\sqrt{-c\log(f)}}+\frac{\frac{\sqrt{\pi}\,bd\operatorname{erf}\left(-\frac{1}{2}\sqrt{-c\log(f)}\left(2\,x+\frac{b}{c}\right)\right)e^{\left(-\frac{b^2\log(f)-4\,ac\log(f)-4\,c}{4\,c}\right)}}{\sqrt{-c\log(f)}}+\frac{2\,de^{(c}}{}}{2\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*(e*x+d)^2,x, algorithm="giac")
```

```
[Out] -1/2*sqrt(pi)*d^2*erf(-1/2*sqrt(-c*log(f))*(2*x + b/c))*e^(-1/4*(b^2*log(f)
 - 4*a*c*log(f))/c)/sqrt(-c*log(f)) + 1/2*(sqrt(pi)*b*d*erf(-1/2*sqrt(-c*lo
g(f))*(2*x + b/c))*e^(-1/4*(b^2*log(f) - 4*a*c*log(f) - 4*c)/c)/sqrt(-c*log
(f)) + 2*d*e^(c*x^2*log(f) + b*x*log(f) + a*log(f) + 1)/log(f))/c - 1/8*(sq
rt(pi)*(b^2*log(f) - 2*c)*erf(-1/2*sqrt(-c*log(f))*(2*x + b/c))*e^(-1/4*(b^
2*log(f) - 4*a*c*log(f) - 8*c)/c)/(sqrt(-c*log(f))*log(f)) - 2*(c*(2*x + b/
c) - 2*b)*e^(c*x^2*log(f) + b*x*log(f) + a*log(f) + 2)/log(f))/c^2
```

maple [A] time = 0.07, size = 307, normalized size = 1.62

$$-\frac{\sqrt{\pi}\;b^2e^2f^af^{-\frac{b^2}{4c}}\operatorname{erf}\left(\frac{b\ln(f)}{2\sqrt{-c\ln(f)}}-\sqrt{-c\ln(f)}\;x\right)}{8\sqrt{-c\ln(f)}\;c^2}+\frac{\sqrt{\pi}\;bde\,f^af^{-\frac{b^2}{4c}}\operatorname{erf}\left(\frac{b\ln(f)}{2\sqrt{-c\ln(f)}}-\sqrt{-c\ln(f)}\;x\right)}{2\sqrt{-c\ln(f)}\;c}-\frac{\sqrt{\pi}\;d^2f^af^{-\frac{b^2}{4c}}\,e}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*x^2+b*x+a)*(e*x+d)^2,x)
```

```
[Out] -1/2*d^2*Pi^(1/2)*f^a*f^(-1/4*b^2/c)/(-c*ln(f))^(1/2)*erf(1/2/(-c*ln(f))^(1
/2)*b*ln(f)-(-c*ln(f))^(1/2)*x)+1/2*e^2/c*x*f^a*f^(b*x)*f^(c*x^2)/ln(f)-1/4
*e^2*b/c^2/ln(f)*f^(c*x^2)*f^(b*x)*f^a-1/8*e^2*b^2/c^2*Pi^(1/2)*f^a*f^(-1/4
*b^2/c)/(-c*ln(f))^(1/2)*erf(1/2/(-c*ln(f))^(1/2)*b*ln(f)-(-c*ln(f))^(1/2)*
x)+1/4*e^2/c/ln(f)*Pi^(1/2)*f^a*f^(-1/4*b^2/c)/(-c*ln(f))^(1/2)*erf(1/2/(-c
*ln(f))^(1/2)*b*ln(f)-(-c*ln(f))^(1/2)*x)+d*e/c/ln(f)*f^(c*x^2)*f^(b*x)*f^a
+1/2*d*e*b/c*Pi^(1/2)*f^a*f^(-1/4*b^2/c)/(-c*ln(f))^(1/2)*erf(1/2/(-c*ln(f)
)^(1/2)*b*ln(f)-(-c*ln(f))^(1/2)*x)
```

maxima [B] time = 2.07, size = 332, normalized size = 1.76

$$-\frac{\left(\frac{\sqrt{\pi}\,(2\,cx+b)b\left(\operatorname{erf}\left(\frac{1}{2}\sqrt{-\frac{(2\,cx+b)^2\log(f)}{c}}\right)-1\right)\log(f)^2}{\sqrt{-\frac{(2\,cx+b)^2\log(f)}{c}}\,\left(c\log(f)\right)^{\frac{3}{2}}}-\frac{2\,cf^{\frac{(2\,cx+b)^2}{4\,c}}\log(f)}{\left(c\log(f)\right)^{\frac{3}{2}}}\right)def^{a-\frac{b^2}{4\,c}}}{2\sqrt{c\log(f)}}+\frac{\left(\frac{\sqrt{\pi}\,(2\,cx+b)b^2\left(\operatorname{erf}\left(\frac{1}{2}\sqrt{-\frac{(2\,cx+b)^2\log(f)}{c}}\right)-1\right)\log(f)^3}{\sqrt{-\frac{(2\,cx+b)^2\log(f)}{c}}\,\left(c\log(f)\right)^{\frac{5}{2}}}-\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*(e*x+d)^2,x, algorithm="maxima")
```

```
[Out] -1/2*(sqrt(pi)*(2*c*x + b)*b*(erf(1/2*sqrt(-(2*c*x + b)^2*log(f)/c)) - 1)*l
og(f)^2/(sqrt(-(2*c*x + b)^2*log(f)/c)*(c*log(f))^(3/2)) - 2*c*f^(1/4*(2*c*
x + b)^2/c)*log(f)/(c*log(f))^(3/2))*d*e*f^(a - 1/4*b^2/c)/sqrt(c*log(f)) +
 1/8*(sqrt(pi)*(2*c*x + b)*b^2*(erf(1/2*sqrt(-(2*c*x + b)^2*log(f)/c)) - 1)
*log(f)^3/(sqrt(-(2*c*x + b)^2*log(f)/c)*(c*log(f))^(5/2)) - 4*(2*c*x + b)^
3*gamma(3/2, -1/4*(2*c*x + b)^2*log(f)/c)*log(f)^3/((-(2*c*x + b)^2*log(f)/
c)^(3/2)*(c*log(f))^(5/2)) - 4*b*c*f^(1/4*(2*c*x + b)^2/c)*log(f)^2/(c*log(
f))^(5/2))*e^2*f^(a - 1/4*b^2/c)/sqrt(c*log(f)) + 1/2*sqrt(pi)*d^2*f^a*erf(
sqrt(-c*log(f))*x - 1/2*b*log(f)/sqrt(-c*log(f)))/(sqrt(-c*log(f))*f^(1/4*b
^2/c))
```

mupad [B] time = 3.85, size = 153, normalized size = 0.81

$$f^a\,f^{c\,x^2}\,f^{b\,x}\,\left(\frac{d\,e}{c\,\ln(f)}-\frac{b\,e^2}{4\,c^2\,\ln(f)}\right)+\frac{e^2\,f^a\,f^{c\,x^2}\,f^{b\,x}\,x}{2\,c\,\ln(f)}-\frac{f^{a-\frac{b^2}{4\,c}}\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{\frac{b\,\ln(f)}{2}+c\,x\,\ln(f)}{\sqrt{c\,\ln(f)}}\right)\,\left(-\frac{\ln(f)\,b^2\,e^2}{8}+\frac{\ln(f)\,b\,c\,d\,e}{2}-\frac{\ln(f}{}\right.}{c^2\,\ln(f)\,\sqrt{c\,\ln(f)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x + c*x^2)*(d + e*x)^2,x)
```

```
[Out] f^a*f^(c*x^2)*f^(b*x)*((d*e)/(c*log(f)) - (b*e^2)/(4*c^2*log(f))) + (e^2*f^
a*f^(c*x^2)*f^(b*x)*x)/(2*c*log(f)) - (f^(a - b^2/(4*c))*pi^(1/2)*erfi(((b*
```

```
log(f))/2 + c*x*log(f))/(c*log(f))^(1/2))*((c*e^2)/4 - (b^2*e^2*log(f))/8 -
 (c^2*d^2*log(f))/2 + (b*c*d*e*log(f))/2))/(c^2*log(f)*(c*log(f))^(1/2))
```

sympy **[F]** time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+bx+cx^2}(d+ex)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*x**2+b*x+a)*(e*x+d)**2,x)
```

```
[Out] Integral(f**(a + b*x + c*x**2)*(d + e*x)**2, x)
```

3.446 $\int f^{a+bx+cx^2}(d+ex)\,dx$

Optimal. Leaf size=90

$$\frac{\sqrt{\pi}\, f^{a-\frac{b^2}{4c}}(2cd-be)\text{erfi}\left(\frac{\sqrt{\log(f)}\,(b+2cx)}{2\sqrt{c}}\right)}{4c^{3/2}\sqrt{\log(f)}}+\frac{ef^{a+bx+cx^2}}{2c\log(f)}$$

```
[Out] 1/2*e*f^(c*x^2+b*x+a)/c/ln(f)+1/4*(-b*e+2*c*d)*f^(a-1/4/c*b^2)*erfi(1/2*(2*
c*x+b)*ln(f)^(1/2)/c^(1/2))*Pi^(1/2)/c^(3/2)/ln(f)^(1/2)
```

Rubi [A] time = 0.04, antiderivative size = 90, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {2240, 2234, 2204}

$$\frac{\sqrt{\pi}\, f^{a-\frac{b^2}{4c}}(2cd-be)\text{Erfi}\left(\frac{\sqrt{\log(f)}\,(b+2cx)}{2\sqrt{c}}\right)}{4c^{3/2}\sqrt{\log(f)}}+\frac{ef^{a+bx+cx^2}}{2c\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x + c*x^2)*(d + e*x),x]
```

```
[Out] (e*f^(a + b*x + c*x^2))/(2*c*Log[f]) + ((2*c*d - b*e)*f^(a - b^2/(4*c))*Sqr
t[Pi]*Erfi[((b + 2*c*x)*Sqrt[Log[f]])/(2*Sqrt[c])])/(4*c^(3/2)*Sqrt[Log[f]]
)
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2234

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2240

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_)), x_Symbol
] :> Simp[(e*F^(a + b*x + c*x^2))/(2*c*Log[F]), x] - Dist[(b*e - 2*c*d)/(2*
c), Int[F^(a + b*x + c*x^2), x], x] /; FreeQ[{F, a, b, c, d, e}, x] && NeQ[
b*e - 2*c*d, 0]
```

Rubi steps

$$\int f^{a+bx+cx^2}(d+ex)\,dx = \frac{ef^{a+bx+cx^2}}{2c\log(f)} - \frac{(-2cd+be)\int f^{a+bx+cx^2}\,dx}{2c}$$
$$= \frac{ef^{a+bx+cx^2}}{2c\log(f)} + \frac{\left((2cd-be)f^{a-\frac{b^2}{4c}}\right)\int f^{\frac{(b+2cx)^2}{4c}}\,dx}{2c}$$
$$= \frac{ef^{a+bx+cx^2}}{2c\log(f)} + \frac{(2cd-be)f^{a-\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)}{4c^{3/2}\sqrt{\log(f)}}$$

Mathematica [A] time = 0.11, size = 96, normalized size = 1.07

$$\frac{f^{a-\frac{b^2}{4c}}\left(\sqrt{\pi}\sqrt{\log(f)}\,(2cd-be)\mathrm{erfi}\left(\frac{\sqrt{\log(f)}\,(b+2cx)}{2\sqrt{c}}\right)+2\sqrt{c}\,ef^{\frac{(b+2cx)^2}{4c}}\right)}{4c^{3/2}\log(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x + c*x^2)*(d + e*x),x]
```

```
[Out] (f^(a - b^2/(4*c))*(2*Sqrt[c]*e*f^((b + 2*c*x)^2/(4*c)) + (2*c*d - b*e)*Sqr
t[Pi]*Erfi[((b + 2*c*x)*Sqrt[Log[f]])/(2*Sqrt[c])]*Sqrt[Log[f]]))/(4*c^(3/2
)*Log[f])
```

fricas [A] time = 0.42, size = 83, normalized size = 0.92

$$\frac{2\,cef^{cx^2+bx+a}-\frac{\sqrt{\pi}\,(2\,cd-be)\sqrt{-c\log(f)}\,\mathrm{erf}\left(\frac{(2\,cx+b)\sqrt{-c\log(f)}}{2\,c}\right)}{f^{\frac{b^2-4\,ac}{4\,c}}}}{4\,c^2\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*(e*x+d),x, algorithm="fricas")
```

```
[Out] 1/4*(2*c*e*f^(c*x^2 + b*x + a) - sqrt(pi)*(2*c*d - b*e)*sqrt(-c*log(f))*erf
(1/2*(2*c*x + b)*sqrt(-c*log(f))/c)/f^(1/4*(b^2 - 4*a*c)/c))/(c^2*log(f))
```

giac [A] time = 0.47, size = 136, normalized size = 1.51

$$-\frac{\sqrt{\pi} d \operatorname{erf}\left(-\frac{1}{2}\sqrt{-c\log(f)}\left(2x+\frac{b}{c}\right)\right)e^{\left(-\frac{b^2\log(f)-4ac\log(f)}{4c}\right)}}{2\sqrt{-c\log(f)}} + \frac{\frac{\sqrt{\pi} b \operatorname{erf}\left(-\frac{1}{2}\sqrt{-c\log(f)}\left(2x+\frac{b}{c}\right)\right)e^{\left(-\frac{b^2\log(f)-4ac\log(f)-4c}{4c}\right)}}{\sqrt{-c\log(f)}} + \frac{2e^{\left(cx^2\log(\ldots\right.}}{\ldots}}{4c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*(e*x+d),x, algorithm="giac")
```

```
[Out] -1/2*sqrt(pi)*d*erf(-1/2*sqrt(-c*log(f))*(2*x + b/c))*e^(-1/4*(b^2*log(f) -
 4*a*c*log(f))/c)/sqrt(-c*log(f)) + 1/4*(sqrt(pi)*b*erf(-1/2*sqrt(-c*log(f)
)*(2*x + b/c))*e^(-1/4*(b^2*log(f) - 4*a*c*log(f) - 4*c)/c)/sqrt(-c*log(f))
 + 2*e^(c*x^2*log(f) + b*x*log(f) + a*log(f) + 1)/log(f))/c
```

maple [A] time = 0.06, size = 131, normalized size = 1.46

$$\frac{\sqrt{\pi}\, b e f^a f^{-\frac{b^2}{4c}} \operatorname{erf}\left(\frac{b\ln(f)}{2\sqrt{-c\ln(f)}} - \sqrt{-c\ln(f)}\,x\right)}{4\sqrt{-c\ln(f)}\,c} - \frac{\sqrt{\pi}\, d f^a f^{-\frac{b^2}{4c}} \operatorname{erf}\left(\frac{b\ln(f)}{2\sqrt{-c\ln(f)}} - \sqrt{-c\ln(f)}\,x\right)}{2\sqrt{-c\ln(f)}} + \frac{e f^a f^{bx} f^{c x^2}}{2c\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*x^2+b*x+a)*(e*x+d),x)
```

```
[Out] -1/2*d*Pi^(1/2)*f^a*f^(-1/4*b^2/c)/(-c*ln(f))^(1/2)*erf(1/2/(-c*ln(f))^(1/2
)*b*ln(f)-(-c*ln(f))^(1/2)*x)+1/2*e/c/ln(f)*f^(c*x^2)*f^(b*x)*f^a+1/4*e*b/c
*Pi^(1/2)*f^a*f^(-1/4*b^2/c)/(-c*ln(f))^(1/2)*erf(1/2/(-c*ln(f))^(1/2)*b*ln
(f)-(-c*ln(f))^(1/2)*x)
```

maxima [B] time = 1.42, size = 160, normalized size = 1.78

$$-\frac{\left(\frac{\sqrt{\pi}(2cx+b)b\left(\operatorname{erf}\left(\frac{1}{2}\sqrt{-\frac{(2cx+b)^2\log(f)}{c}}\right)-1\right)\log(f)^2}{\sqrt{-\frac{(2cx+b)^2\log(f)}{c}}\,(c\log(f))^{\frac{3}{2}}} - \frac{2cf^{\frac{(2cx+b)^2}{4c}}\log(f)}{(c\log(f))^{\frac{3}{2}}}\right)ef^{a-\frac{b^2}{4c}}}{4\sqrt{c\log(f)}} + \frac{\sqrt{\pi}\, d f^a \operatorname{erf}\left(\sqrt{-c\log(f)}\,x - \frac{b\log(f)}{2\sqrt{-c\log(f)}}\right)}{2\sqrt{-c\log(f)}\,f^{\frac{b^2}{4c}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*(e*x+d),x, algorithm="maxima")
```

```
[Out] -1/4*(sqrt(pi)*(2*c*x + b)*b*(erf(1/2*sqrt(-(2*c*x + b)^2*log(f)/c)) - 1)*l
og(f)^2/(sqrt(-(2*c*x + b)^2*log(f)/c)*(c*log(f))^(3/2)) - 2*c*f^(1/4*(2*c*
```

```
x + b)^2/c)*log(f)/(c*log(f))^(3/2))*e*f^(a - 1/4*b^2/c)/sqrt(c*log(f)) + 1
/2*sqrt(pi)*d*f^a*erf(sqrt(-c*log(f))*x - 1/2*b*log(f)/sqrt(-c*log(f)))/(sq
rt(-c*log(f))*f^(1/4*b^2/c))
```

mupad [B] time = 3.71, size = 80, normalized size = 0.89

$$\frac{e\,f^a\,f^{c\,x^2}\,f^{b\,x}}{2\,c\,\ln(f)}-\frac{f^{a-\frac{b^2}{4\,c}}\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\frac{b\,\ln(f)}{2}+c\,x\,\ln(f)}{\sqrt{c\,\ln(f)}}\right)\,\left(\frac{b\,e}{4}-\frac{c\,d}{2}\right)}{c\,\sqrt{c\,\ln(f)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x + c*x^2)*(d + e*x),x)
```

```
[Out] (e*f^a*f^(c*x^2)*f^(b*x))/(2*c*log(f)) - (f^(a - b^2/(4*c))*pi^(1/2)*erfi((
(b*log(f))/2 + c*x*log(f))/(c*log(f))^(1/2))*((b*e)/4 - (c*d)/2))/(c*(c*log
(f))^(1/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+bx+cx^2}\,(d+ex)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*x**2+b*x+a)*(e*x+d),x)
```

```
[Out] Integral(f**(a + b*x + c*x**2)*(d + e*x), x)
```

3.447 $\int \frac{f^{a+bx+cx^2}}{d+ex}\,dx$

Optimal. Leaf size=23

$$\text{Int}\left(\frac{f^{a+bx+cx^2}}{d+ex},x\right)$$

```
[Out] Unintegrable(f^(c*x^2+b*x+a)/(e*x+d),x)
```

Rubi [A] time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{f^{a+bx+cx^2}}{d+ex}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[f^(a + b*x + c*x^2)/(d + e*x),x]
```

```
[Out] Defer[Int][f^(a + b*x + c*x^2)/(d + e*x), x]
```

Rubi steps

$$\int \frac{f^{a+bx+cx^2}}{d+ex}\,dx = \int \frac{f^{a+bx+cx^2}}{d+ex}\,dx$$

Mathematica [A] time = 0.22, size = 0, normalized size = 0.00

$$\int \frac{f^{a+bx+cx^2}}{d+ex}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[f^(a + b*x + c*x^2)/(d + e*x),x]
```

```
[Out] Integrate[f^(a + b*x + c*x^2)/(d + e*x), x]
```

fricas [A] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{f^{cx^2+bx+a}}{ex+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)/(e*x+d),x, algorithm="fricas")
[Out] integral(f^(c*x^2 + b*x + a)/(e*x + d), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{cx^2+bx+a}}{ex+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)/(e*x+d),x, algorithm="giac")
[Out] integrate(f^(c*x^2 + b*x + a)/(e*x + d), x)
```

maple [A] time = 0.10, size = 0, normalized size = 0.00

$$\int \frac{f^{c\,x^2+bx+a}}{ex+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*x^2+b*x+a)/(e*x+d),x)
[Out] int(f^(c*x^2+b*x+a)/(e*x+d),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{cx^2+bx+a}}{ex+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)/(e*x+d),x, algorithm="maxima")
[Out] integrate(f^(c*x^2 + b*x + a)/(e*x + d), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{f^{c\,x^2+b\,x+a}}{d+e\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x + c*x^2)/(d + e*x),x)
[Out] int(f^(a + b*x + c*x^2)/(d + e*x), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+bx+cx^2}}{d+ex}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*x**2+b*x+a)/(e*x+d),x)
```

```
[Out] Integral(f**(a + b*x + c*x**2)/(d + e*x), x)
```

3.448 $\int \frac{f^{a+bx+cx^2}}{(d+ex)^2}\,dx$

Optimal. Leaf size=120

$$-\frac{\log(f)(2cd-be)\text{Int}\left(\frac{f^{a+bx+cx^2}}{d+ex},x\right)}{e^2}+\frac{\sqrt{\pi}\sqrt{c}\sqrt{\log(f)}\,f^{a-\frac{b^2}{4c}}\text{erfi}\left(\frac{\sqrt{\log(f)}\,(b+2cx)}{2\sqrt{c}}\right)}{e^2}-\frac{f^{a+bx+cx^2}}{e(d+ex)}$$

```
[Out] -f^(c*x^2+b*x+a)/e/(e*x+d)+f^(a-1/4/c*b^2)*erfi(1/2*(2*c*x+b)*ln(f)^(1/2)/c
^(1/2))*c^(1/2)*Pi^(1/2)*ln(f)^(1/2)/e^2-(-b*e+2*c*d)*ln(f)*Unintegrable(f^
(c*x^2+b*x+a)/(e*x+d),x)/e^2
```

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{f^{a+bx+cx^2}}{(d+ex)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[f^(a + b*x + c*x^2)/(d + e*x)^2,x]
```

```
[Out] -(f^(a + b*x + c*x^2)/(e*(d + e*x))) + (Sqrt[c]*f^(a - b^2/(4*c))*Sqrt[Pi]*
Erfi[((b + 2*c*x)*Sqrt[Log[f]])/(2*Sqrt[c])]*Sqrt[Log[f]])/e^2 - ((2*c*d -
b*e)*Log[f]*Defer[Int][f^(a + b*x + c*x^2)/(d + e*x), x])/e^2
```

Rubi steps

$$\begin{aligned}
\int \frac{f^{a+bx+cx^2}}{(d+ex)^2}\,dx &= -\frac{f^{a+bx+cx^2}}{e(d+ex)}+\frac{(2c\log(f))\int f^{a+bx+cx^2}\,dx}{e^2}-\frac{((2cd-be)\log(f))\int \frac{f^{a+bx+cx^2}}{d+ex}\,dx}{e^2}\\
&= -\frac{f^{a+bx+cx^2}}{e(d+ex)}-\frac{((2cd-be)\log(f))\int \frac{f^{a+bx+cx^2}}{d+ex}\,dx}{e^2}+\frac{\left(2cf^{a-\frac{b^2}{4c}}\log(f)\right)\int f^{\frac{(b+2cx)^2}{4c}}\,dx}{e^2}\\
&= -\frac{f^{a+bx+cx^2}}{e(d+ex)}+\frac{\sqrt{c}\,f^{a-\frac{b^2}{4c}}\sqrt{\pi}\,\text{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)\sqrt{\log(f)}}{e^2}-\frac{((2cd-be)\log(f))\int \frac{f^{a+bx+cx^2}}{d+ex}\,dx}{e^2}
\end{aligned}$$

Mathematica [A] time = 0.59, size = 0, normalized size = 0.00

$$\int \frac{f^{a+bx+cx^2}}{(d+ex)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[f^(a + b*x + c*x^2)/(d + e*x)^2,x]
[Out] Integrate[f^(a + b*x + c*x^2)/(d + e*x)^2, x]
```

fricas [A] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{f^{cx^2+bx+a}}{e^2x^2+2\,dex+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)/(e*x+d)^2,x, algorithm="fricas")
[Out] integral(f^(c*x^2 + b*x + a)/(e^2*x^2 + 2*d*e*x + d^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{f^{cx^2+bx+a}}{(ex+d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)/(e*x+d)^2,x, algorithm="giac")
[Out] integrate(f^(c*x^2 + b*x + a)/(e*x + d)^2, x)
```

maple [A] time = 0.10, size = 0, normalized size = 0.00

$$\int\frac{f^{c\,x^2+bx+a}}{(ex+d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*x^2+b*x+a)/(e*x+d)^2,x)
[Out] int(f^(c*x^2+b*x+a)/(e*x+d)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{f^{cx^2+bx+a}}{(ex+d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)/(e*x+d)^2,x, algorithm="maxima")
```

```
[Out] integrate(f^(c*x^2 + b*x + a)/(e*x + d)^2, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{f^{c\,x^2+b\,x+a}}{{\left(d+e\,x\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x + c*x^2)/(d + e*x)^2,x)
```

```
[Out] int(f^(a + b*x + c*x^2)/(d + e*x)^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+bx+cx^2}}{(d+ex)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*x**2+b*x+a)/(e*x+d)**2,x)
```

```
[Out] Integral(f**(a + b*x + c*x**2)/(d + e*x)**2, x)
```

3.449 $\int \frac{f^{a+bx+cx^2}}{(d+ex)^3}\,dx$

Optimal. Leaf size=207

$$\frac{\log^2(f)(2cd-be)^2\text{Int}\left(\frac{f^{a+bx+cx^2}}{d+ex},x\right)}{2e^4}+\frac{c\log(f)\text{Int}\left(\frac{f^{a+bx+cx^2}}{d+ex},x\right)}{e^2}-\frac{\sqrt{\pi}\sqrt{c}\log^{\frac{3}{2}}(f)f^{a-\frac{b^2}{4c}}(2cd-be)\text{erfi}\left(\frac{\sqrt{\log(f)}(b+2cx)}{2\sqrt{c}}\right)}{2e^4}$$

```
[Out] -1/2*f^(c*x^2+b*x+a)/e/(e*x+d)^2+1/2*(-b*e+2*c*d)*f^(c*x^2+b*x+a)*ln(f)/e^3
/(e*x+d)-1/2*(-b*e+2*c*d)*f^(a-1/4/c*b^2)*erfi(1/2*(2*c*x+b)*ln(f)^(1/2)/c^
(1/2))*ln(f)^(3/2)*c^(1/2)*Pi^(1/2)/e^4+c*ln(f)*Unintegrable(f^(c*x^2+b*x+a
)/(e*x+d),x)/e^2+1/2*(-b*e+2*c*d)^2*ln(f)^2*Unintegrable(f^(c*x^2+b*x+a)/(e
*x+d),x)/e^4
```

Rubi [A] time = 0.21, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{f^{a+bx+cx^2}}{(d+ex)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[f^(a + b*x + c*x^2)/(d + e*x)^3,x]
```

```
[Out] -f^(a + b*x + c*x^2)/(2*e*(d + e*x)^2) + ((2*c*d - b*e)*f^(a + b*x + c*x^2)
*Log[f])/(2*e^3*(d + e*x)) - (Sqrt[c]*(2*c*d - b*e)*f^(a - b^2/(4*c))*Sqrt[
Pi]*Erfi[((b + 2*c*x)*Sqrt[Log[f]])/(2*Sqrt[c])]*Log[f]^(3/2))/(2*e^4) + (c
*Log[f]*Defer[Int][f^(a + b*x + c*x^2)/(d + e*x), x])/e^2 + ((2*c*d - b*e)^
2*Log[f]^2*Defer[Int][f^(a + b*x + c*x^2)/(d + e*x), x])/(2*e^4)
```

Rubi steps

$$\int \frac{f^{a+bx+cx^2}}{(d+ex)^3}\,dx = -\frac{f^{a+bx+cx^2}}{2e(d+ex)^2} + \frac{(c\log(f))\int \frac{f^{a+bx+cx^2}}{d+ex}\,dx}{e^2} - \frac{((2cd-be)\log(f))\int \frac{f^{a+bx+cx^2}}{(d+ex)^2}\,dx}{2e^2}$$

$$= -\frac{f^{a+bx+cx^2}}{2e(d+ex)^2} + \frac{(2cd-be)f^{a+bx+cx^2}\log(f)}{2e^3(d+ex)} + \frac{(c\log(f))\int \frac{f^{a+bx+cx^2}}{d+ex}\,dx}{e^2} - \frac{\left(c(2cd-be)\log^2(f)\right)}{e^4}$$

$$= -\frac{f^{a+bx+cx^2}}{2e(d+ex)^2} + \frac{(2cd-be)f^{a+bx+cx^2}\log(f)}{2e^3(d+ex)} + \frac{(c\log(f))\int \frac{f^{a+bx+cx^2}}{d+ex}\,dx}{e^2} + \frac{\left((2cd-be)^2\log^2(f)\right)}{2e^4}$$

$$= -\frac{f^{a+bx+cx^2}}{2e(d+ex)^2} + \frac{(2cd-be)f^{a+bx+cx^2}\log(f)}{2e^3(d+ex)} - \frac{\sqrt{c}\,(2cd-be)f^{a-\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)\log^{\frac{3}{2}}(}{2e^4}$$

Mathematica [**A**] time = 0.85, size = 0, normalized size = 0.00

$$\int \frac{f^{a+bx+cx^2}}{(d+ex)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[f^(a + b*x + c*x^2)/(d + e*x)^3,x]
[Out] Integrate[f^(a + b*x + c*x^2)/(d + e*x)^3, x]
```

fricas [**A**] time = 0.43, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{f^{cx^2+bx+a}}{e^3x^3+3\,de^2x^2+3\,d^2ex+d^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)/(e*x+d)^3,x, algorithm="fricas")
[Out] integral(f^(c*x^2 + b*x + a)/(e^3*x^3 + 3*d*e^2*x^2 + 3*d^2*e*x + d^3), x)
```

giac [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{cx^2+bx+a}}{(ex+d)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)/(e*x+d)^3,x, algorithm="giac")
[Out] integrate(f^(c*x^2 + b*x + a)/(e*x + d)^3, x)
```

maple [A] time = 0.10, size = 0, normalized size = 0.00

$$\int \frac{f^{c\,x^2+bx+a}}{(ex+d)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*x^2+b*x+a)/(e*x+d)^3,x)
[Out] int(f^(c*x^2+b*x+a)/(e*x+d)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{cx^2+bx+a}}{(ex+d)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)/(e*x+d)^3,x, algorithm="maxima")
[Out] integrate(f^(c*x^2 + b*x + a)/(e*x + d)^3, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{f^{c\,x^2+b\,x+a}}{(d+e\,x)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x + c*x^2)/(d + e*x)^3,x)
[Out] int(f^(a + b*x + c*x^2)/(d + e*x)^3, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+bx+cx^2}}{(d+ex)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*x**2+b*x+a)/(e*x+d)**3,x)
[Out] Integral(f**(a + b*x + c*x**2)/(d + e*x)**3, x)
```

3.450 $\int f^{a+bx+cx^2}(b+2cx)^3\,dx$

Optimal. Leaf size=45

$$\frac{(b+2cx)^2 f^{a+bx+cx^2}}{\log(f)}-\frac{4cf^{a+bx+cx^2}}{\log^2(f)}$$

```
[Out] -4*c*f^(c*x^2+b*x+a)/ln(f)^2+f^(c*x^2+b*x+a)*(2*c*x+b)^2/ln(f)
```

Rubi [A] time = 0.06, antiderivative size = 45, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2237, 2236}

$$\frac{(b+2cx)^2 f^{a+bx+cx^2}}{\log(f)}-\frac{4cf^{a+bx+cx^2}}{\log^2(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x + c*x^2)*(b + 2*c*x)^3,x]
```

```
[Out] (-4*c*f^(a + b*x + c*x^2))/Log[f]^2 + (f^(a + b*x + c*x^2)*(b + 2*c*x)^2)/L
og[f]
```

Rule 2236

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_)), x_Symbol
] :> Simp[(e*F^(a + b*x + c*x^2))/(2*c*Log[F]), x] /; FreeQ[{F, a, b, c, d,
 e}, x] && EqQ[b*e - 2*c*d, 0]
```

Rule 2237

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_))^(m_), x_S
ymbol] :> Simp[(e*(d + e*x)^(m - 1)*F^(a + b*x + c*x^2))/(2*c*Log[F]), x] -
 Dist[((m - 1)*e^2)/(2*c*Log[F]), Int[(d + e*x)^(m - 2)*F^(a + b*x + c*x^2)
, x], x] /; FreeQ[{F, a, b, c, d, e}, x] && EqQ[b*e - 2*c*d, 0] && GtQ[m, 1
]
```

Rubi steps

$$\begin{aligned}\int f^{a+bx+cx^2}(b+2cx)^3\,dx &= \frac{f^{a+bx+cx^2}(b+2cx)^2}{\log(f)}-\frac{(4c)\int f^{a+bx+cx^2}(b+2cx)\,dx}{\log(f)}\\ &= -\frac{4cf^{a+bx+cx^2}}{\log^2(f)}+\frac{f^{a+bx+cx^2}(b+2cx)^2}{\log(f)}\end{aligned}$$

Mathematica [A] time = 0.13, size = 31, normalized size = 0.69

$$\frac{f^{a+x(b+cx)}\left(\log(f)(b+2cx)^2-4c\right)}{\log^2(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x + c*x^2)*(b + 2*c*x)^3,x]
```

```
[Out] (f^(a + x*(b + c*x))*(-4*c + (b + 2*c*x)^2*Log[f]))/Log[f]^2
```

fricas [A] time = 0.44, size = 41, normalized size = 0.91

$$\frac{\left(\left(4\,c^2x^2+4\,bcx+b^2\right)\log(f)-4\,c\right)f^{cx^2+bx+a}}{\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*(2*c*x+b)^3,x, algorithm="fricas")
```

```
[Out] ((4*c^2*x^2 + 4*b*c*x + b^2)*log(f) - 4*c)*f^(c*x^2 + b*x + a)/log(f)^2
```

giac [B] time = 0.57, size = 780, normalized size = 17.33

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*(2*c*x+b)^3,x, algorithm="giac")
```

```
[Out] (2*((b^2*log(abs(f)) + 4*(c*x^2 + b*x)*c*log(abs(f)) - 4*c)*(pi^2*sgn(f) -
pi^2 + 2*log(abs(f))^2)/((pi^2*sgn(f) - pi^2 + 2*log(abs(f))^2)^2 + 4*(pi*l
og(abs(f))*sgn(f) - pi*log(abs(f)))^2) + (pi*b^2*sgn(f) + 4*pi*(c*x^2 + b*x
)*c*sgn(f) - pi*b^2 - 4*pi*(c*x^2 + b*x)*c)*(pi*log(abs(f))*sgn(f) - pi*log
(abs(f)))/((pi^2*sgn(f) - pi^2 + 2*log(abs(f))^2)^2 + 4*(pi*log(abs(f))*sgn
(f) - pi*log(abs(f)))^2))*cos(-1/2*pi*c*x^2*sgn(f) + 1/2*pi*c*x^2 - 1/2*pi*
b*x*sgn(f) + 1/2*pi*b*x - 1/2*pi*a*sgn(f) + 1/2*pi*a) + ((pi*b^2*sgn(f) + 4
*pi*(c*x^2 + b*x)*c*sgn(f) - pi*b^2 - 4*pi*(c*x^2 + b*x)*c)*(pi^2*sgn(f) -
pi^2 + 2*log(abs(f))^2)/((pi^2*sgn(f) - pi^2 + 2*log(abs(f))^2)^2 + 4*(pi*l
og(abs(f))*sgn(f) - pi*log(abs(f)))^2) - 4*(b^2*log(abs(f)) + 4*(c*x^2 + b*
x)*c*log(abs(f)) - 4*c)*(pi*log(abs(f))*sgn(f) - pi*log(abs(f)))/((pi^2*sgn
(f) - pi^2 + 2*log(abs(f))^2)^2 + 4*(pi*log(abs(f))*sgn(f) - pi*log(abs(f))
)^2))*sin(-1/2*pi*c*x^2*sgn(f) + 1/2*pi*c*x^2 - 1/2*pi*b*x*sgn(f) + 1/2*pi*
b*x - 1/2*pi*a*sgn(f) + 1/2*pi*a))*e^((c*x^2 + b*x)*log(abs(f)) + a*log(abs
(f))) - 1/2*((2*b^2*i*log(abs(f)) + 8*(c*x^2 + b*x)*c*i*log(abs(f)) - pi*b^
2*sgn(f) - 4*pi*(c*x^2 + b*x)*c*sgn(f) + pi*b^2 + 4*pi*(c*x^2 + b*x)*c - 8*
```

```
c*i)*e^(1/2*(pi*(c*x^2 + b*x)*(sgn(f) - 1) + pi*a*(sgn(f) - 1))*i)/(2*pi*i*
log(abs(f))*sgn(f) - 2*pi*i*log(abs(f)) + pi^2*sgn(f) - pi^2 + 2*log(abs(f)
)^2) + (2*b^2*i*log(abs(f)) + 8*(c*x^2 + b*x)*c*i*log(abs(f)) + pi*b^2*sgn(
f) + 4*pi*(c*x^2 + b*x)*c*sgn(f) - pi*b^2 - 4*pi*(c*x^2 + b*x)*c - 8*c*i)*e
^(-1/2*(pi*(c*x^2 + b*x)*(sgn(f) - 1) + pi*a*(sgn(f) - 1))*i)/(2*pi*i*log(a
bs(f))*sgn(f) - 2*pi*i*log(abs(f)) - pi^2*sgn(f) + pi^2 - 2*log(abs(f))^2))
*e^((c*x^2 + b*x)*log(abs(f)) + a*log(abs(f)))/i
```

maple [A] time = 0.01, size = 45, normalized size = 1.00

$$\frac{\left(4c^2x^2\ln(f)+4bcx\ln(f)+b^2\ln(f)-4c\right)f^{c\,x^2+bx+a}}{\ln(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*x^2+b*x+a)*(2*c*x+b)^3,x)
```

```
[Out] (4*ln(f)*c^2*x^2+4*b*c*x*ln(f)+ln(f)*b^2-4*c)*f^(c*x^2+b*x+a)/ln(f)^2
```

maxima [C] time = 2.35, size = 539, normalized size = 11.98

$$-\frac{3\left(\frac{\sqrt{\pi}\,(2\,cx+b)b\left(\operatorname{erf}\left(\frac{1}{2}\sqrt{-\frac{(2\,cx+b)^2\log(f)}{c}}\right)-1\right)\log(f)^2}{\sqrt{-\frac{(2\,cx+b)^2\log(f)}{c}}\left(c\log(f)\right)^{\frac{3}{2}}}-\frac{2\,cf^{\frac{(2\,cx+b)^2}{4\,c}}\log(f)}{\left(c\log(f)\right)^{\frac{3}{2}}}\right)b^2cf^{a-\frac{b^2}{4\,c}}}{2\sqrt{c\log(f)}}+\frac{3\left(\frac{\sqrt{\pi}\,(2\,cx+b)b^2\left(\operatorname{erf}\left(\frac{1}{2}\sqrt{-\frac{(2\,cx+b)^2\log(f)}{c}}\right)-1\right)\mathrm{lo}}{\sqrt{-\frac{(2\,cx+b)^2\log(f)}{c}}\left(c\log(f)\right)^{\frac{5}{2}}}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*(2*c*x+b)^3,x, algorithm="maxima")
```

```
[Out] -3/2*(sqrt(pi)*(2*c*x + b)*b*(erf(1/2*sqrt(-(2*c*x + b)^2*log(f)/c)) - 1)*l
og(f)^2/(sqrt(-(2*c*x + b)^2*log(f)/c)*(c*log(f))^(3/2)) - 2*c*f^(1/4*(2*c*
x + b)^2/c)*log(f)/(c*log(f))^(3/2))*b^2*c*f^(a - 1/4*b^2/c)/sqrt(c*log(f))
 + 3/2*(sqrt(pi)*(2*c*x + b)*b^2*(erf(1/2*sqrt(-(2*c*x + b)^2*log(f)/c)) -
1)*log(f)^3/(sqrt(-(2*c*x + b)^2*log(f)/c)*(c*log(f))^(5/2)) - 4*(2*c*x + b
)^3*gamma(3/2, -1/4*(2*c*x + b)^2*log(f)/c)*log(f)^3/((-(2*c*x + b)^2*log(f
)/c)^(3/2)*(c*log(f))^(5/2)) - 4*b*c*f^(1/4*(2*c*x + b)^2/c)*log(f)^2/(c*lo
g(f))^(5/2))*b*c^2*f^(a - 1/4*b^2/c)/sqrt(c*log(f)) - 1/2*(sqrt(pi)*(2*c*x
+ b)*b^3*(erf(1/2*sqrt(-(2*c*x + b)^2*log(f)/c)) - 1)*log(f)^4/(sqrt(-(2*c*
x + b)^2*log(f)/c)*(c*log(f))^(7/2)) - 12*(2*c*x + b)^3*b*gamma(3/2, -1/4*(
2*c*x + b)^2*log(f)/c)*log(f)^4/((-(2*c*x + b)^2*log(f)/c)^(3/2)*(c*log(f))
^(7/2)) - 6*b^2*c*f^(1/4*(2*c*x + b)^2/c)*log(f)^3/(c*log(f))^(7/2) + 8*c^2
*gamma(2, -1/4*(2*c*x + b)^2*log(f)/c)*log(f)^2/(c*log(f))^(7/2))*c^3*f^(a
```

```
- 1/4*b^2/c)/sqrt(c*log(f)) + 1/2*sqrt(pi)*b^3*f^a*erf(sqrt(-c*log(f))*x -
1/2*b*log(f)/sqrt(-c*log(f)))/(sqrt(-c*log(f))*f^(1/4*b^2/c))
```

mupad [B] time = 3.81, size = 44, normalized size = 0.98

$$\frac{f^{c\,x^2+b\,x+a}\,\left(\ln(f)\,b^2+4\,\ln(f)\,b\,c\,x+4\,\ln(f)\,c^2\,x^2-4\,c\right)}{\ln(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x + c*x^2)*(b + 2*c*x)^3,x)
```

```
[Out] (f^(a + b*x + c*x^2)*(b^2*log(f) - 4*c + 4*c^2*x^2*log(f) + 4*b*c*x*log(f))
)/log(f)^2
```

sympy [A] time = 0.17, size = 85, normalized size = 1.89

$$\begin{cases} \frac{f^{a+bx+cx^2}\left(b^2\log(f)+4bcx\log(f)+4c^2x^2\log(f)-4c\right)}{\log(f)^2} & \text{for}\ \log(f)^2 \neq 0 \\ b^3x+3b^2cx^2+4bc^2x^3+2c^3x^4 & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*x**2+b*x+a)*(2*c*x+b)**3,x)
```

```
[Out] Piecewise(((f**(a + b*x + c*x**2)*(b**2*log(f) + 4*b*c*x*log(f) + 4*c**2*x**
2*log(f) - 4*c)/log(f)**2, Ne(log(f)**2, 0)), (b**3*x + 3*b**2*c*x**2 + 4*b
*c**2*x**3 + 2*c**3*x**4, True))
```

3.451 $\int f^{a+bx+cx^2}(b+2cx)^2\,dx$

Optimal. Leaf size=78

$$\frac{(b+2cx)f^{a+bx+cx^2}}{\log(f)}-\frac{\sqrt{\pi}\sqrt{c}\,f^{a-\frac{b^2}{4c}}\operatorname{erfi}\left(\frac{\sqrt{\log(f)}\,(b+2cx)}{2\sqrt{c}}\right)}{\log^{\frac{3}{2}}(f)}$$

```
[Out] f^(c*x^2+b*x+a)*(2*c*x+b)/ln(f)-f^(a-1/4/c*b^2)*erfi(1/2*(2*c*x+b)*ln(f)^(1
/2)/c^(1/2))*c^(1/2)*Pi^(1/2)/ln(f)^(3/2)
```

Rubi [A] time = 0.06, antiderivative size = 78, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2237, 2234, 2204}

$$\frac{(b+2cx)f^{a+bx+cx^2}}{\log(f)}-\frac{\sqrt{\pi}\sqrt{c}\,f^{a-\frac{b^2}{4c}}\operatorname{Erfi}\left(\frac{\sqrt{\log(f)}\,(b+2cx)}{2\sqrt{c}}\right)}{\log^{\frac{3}{2}}(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x + c*x^2)*(b + 2*c*x)^2,x]
```

```
[Out] -((Sqrt[c]*f^(a - b^2/(4*c))*Sqrt[Pi]*Erfi[((b + 2*c*x)*Sqrt[Log[f]])/(2*Sq
rt[c])])/Log[f]^(3/2)) + (f^(a + b*x + c*x^2)*(b + 2*c*x))/Log[f]
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2234

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2237

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_))^(m_), x_S
ymbol] :> Simp[(e*(d + e*x)^(m - 1)*F^(a + b*x + c*x^2))/(2*c*Log[F]), x] -
 Dist[((m - 1)*e^2)/(2*c*Log[F]), Int[(d + e*x)^(m - 2)*F^(a + b*x + c*x^2)
, x], x] /; FreeQ[{F, a, b, c, d, e}, x] && EqQ[b*e - 2*c*d, 0] && GtQ[m, 1
]
```

Rubi steps

$$
\begin{aligned}
\int f^{a+bx+cx^2}(b+2cx)^2\,dx &= \frac{f^{a+bx+cx^2}(b+2cx)}{\log(f)}-\frac{(2c)\int f^{a+bx+cx^2}\,dx}{\log(f)}\\
&= \frac{f^{a+bx+cx^2}(b+2cx)}{\log(f)}-\frac{\left(2cf^{a-\frac{b^2}{4c}}\right)\int f^{\frac{(b+2cx)^2}{4c}}\,dx}{\log(f)}\\
&= -\frac{\sqrt{c}\,f^{a-\frac{b^2}{4c}}\sqrt{\pi}\,\text{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)}{\log^{\frac{3}{2}}(f)}+\frac{f^{a+bx+cx^2}(b+2cx)}{\log(f)}
\end{aligned}
$$

Mathematica [A] time = 0.11, size = 86, normalized size = 1.10

$$
\frac{f^{a-\frac{b^2}{4c}}\left(\sqrt{\log(f)}\,(b+2cx)f^{\frac{(b+2cx)^2}{4c}}-\sqrt{\pi}\,\sqrt{c}\,\text{erfi}\left(\frac{\sqrt{\log(f)}\,(b+2cx)}{2\sqrt{c}}\right)\right)}{\log^{\frac{3}{2}}(f)}
$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x + c*x^2)*(b + 2*c*x)^2,x]
```

```
[Out] (f^(a - b^2/(4*c))*(-(Sqrt[c]*Sqrt[Pi]*Erfi[((b + 2*c*x)*Sqrt[Log[f]])/(2*S
qrt[c])]) + f^((b + 2*c*x)^2/(4*c))*(b + 2*c*x)*Sqrt[Log[f]]))/Log[f]^(3/2)
```

fricas [A] time = 0.43, size = 74, normalized size = 0.95

$$
\frac{(2\,cx+b)f^{cx^2+bx+a}\log(f)+\frac{\sqrt{\pi}\,\sqrt{-c\log(f)}\,\text{erf}\left(\frac{(2\,cx+b)\sqrt{-c\log(f)}}{2\,c}\right)}{f^{\frac{b^2-4\,ac}{4\,c}}}}{\log(f)^2}
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*(2*c*x+b)^2,x, algorithm="fricas")
```

```
[Out] ((2*c*x + b)*f^(c*x^2 + b*x + a)*log(f) + sqrt(pi)*sqrt(-c*log(f))*erf(1/2*
(2*c*x + b)*sqrt(-c*log(f))/c)/f^(1/4*(b^2 - 4*a*c)/c))/log(f)^2
```

giac [A] time = 0.45, size = 88, normalized size = 1.13

$$
\frac{c\left(2\,x+\frac{b}{c}\right)e^{\left(cx^2\log(f)+bx\log(f)+a\log(f)\right)}}{\log(f)}+\frac{\sqrt{\pi}\,c\,\text{erf}\left(-\frac{1}{2}\,\sqrt{-c\log(f)}\left(2\,x+\frac{b}{c}\right)\right)e^{\left(-\frac{b^2\log(f)-4\,ac\log(f)}{4\,c}\right)}}{\sqrt{-c\log(f)}\,\log(f)}
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*(2*c*x+b)^2,x, algorithm="giac")
```

```
[Out] c*(2*x + b/c)*e^(c*x^2*log(f) + b*x*log(f) + a*log(f))/log(f) + sqrt(pi)*c*
erf(-1/2*sqrt(-c*log(f))*(2*x + b/c))*e^(-1/4*(b^2*log(f) - 4*a*c*log(f))/c
)/(sqrt(-c*log(f))*log(f))
```

maple [A] time = 0.07, size = 99, normalized size = 1.27

$$\frac{2cx\, f^{a} f^{bx} f^{c\,x^{2}}}{\ln(f)} + \frac{b\, f^{a} f^{bx} f^{c\,x^{2}}}{\ln(f)} + \frac{\sqrt{\pi}\; c\, f^{a} f^{-\frac{b^{2}}{4c}} \operatorname{erf}\left(\frac{b\ln(f)}{2\sqrt{-c\ln(f)}} - \sqrt{-c\ln(f)}\; x\right)}{\sqrt{-c\ln(f)}\;\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*x^2+b*x+a)*(2*c*x+b)^2,x)
```

```
[Out] 2*c*x*f^a*f^(b*x)*f^(c*x^2)/ln(f)+b/ln(f)*f^(c*x^2)*f^(b*x)*f^a+c/ln(f)*Pi^
(1/2)*f^a*f^(-1/4*b^2/c)/(-c*ln(f))^(1/2)*erf(1/2/(-c*ln(f))^(1/2)*b*ln(f)-
(-c*ln(f))^(1/2)*x)
```

maxima [B] time = 2.06, size = 332, normalized size = 4.26

$$-\frac{\left(\frac{\sqrt{\pi}\,(2\,cx+b)b\left(\operatorname{erf}\left(\frac{1}{2}\,\sqrt{-\frac{(2\,cx+b)^{2}\log(f)}{c}}\right)-1\right)\log(f)^{2}}{\sqrt{-\frac{(2\,cx+b)^{2}\log(f)}{c}}\,\left(c\log(f)\right)^{\frac{3}{2}}} - \frac{2\,cf^{\frac{(2\,cx+b)^{2}}{4\,c}}\log(f)}{\left(c\log(f)\right)^{\frac{3}{2}}}\right)bcf^{a-\frac{b^{2}}{4\,c}}}{\sqrt{c\log(f)}} + \frac{\left(\frac{\sqrt{\pi}\,(2\,cx+b)b^{2}\left(\operatorname{erf}\left(\frac{1}{2}\,\sqrt{-\frac{(2\,cx+b)^{2}\log(f)}{c}}\right)-1\right)\log(f)^{3}}{\sqrt{-\frac{(2\,cx+b)^{2}\log(f)}{c}}\,\left(c\log(f)\right)^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*(2*c*x+b)^2,x, algorithm="maxima")
```

```
[Out] -(sqrt(pi)*(2*c*x + b)*b*(erf(1/2*sqrt(-(2*c*x + b)^2*log(f)/c)) - 1)*log(f
)^2/(sqrt(-(2*c*x + b)^2*log(f)/c)*(c*log(f))^(3/2)) - 2*c*f^(1/4*(2*c*x +
b)^2/c)*log(f)/(c*log(f))^(3/2))*b*c*f^(a - 1/4*b^2/c)/sqrt(c*log(f)) + 1/2
*(sqrt(pi)*(2*c*x + b)*b^2*(erf(1/2*sqrt(-(2*c*x + b)^2*log(f)/c)) - 1)*log
(f)^3/(sqrt(-(2*c*x + b)^2*log(f)/c)*(c*log(f))^(5/2)) - 4*(2*c*x + b)^3*ga
mma(3/2, -1/4*(2*c*x + b)^2*log(f)/c)*log(f)^3/((-(2*c*x + b)^2*log(f)/c)^(
3/2)*(c*log(f))^(5/2)) - 4*b*c*f^(1/4*(2*c*x + b)^2/c)*log(f)^2/(c*log(f))^
(5/2))*c^2*f^(a - 1/4*b^2/c)/sqrt(c*log(f)) + 1/2*sqrt(pi)*b^2*f^a*erf(sqrt
(-c*log(f))*x - 1/2*b*log(f)/sqrt(-c*log(f)))/(sqrt(-c*log(f))*f^(1/4*b^2/c
))
```

mupad [B] time = 3.79, size = 92, normalized size = 1.18

$$\frac{b\,f^a\,f^{c\,x^2}\,f^{b\,x}}{\ln(f)}-\frac{c\,f^{a-\frac{b^2}{4\,c}}\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\frac{b\,\ln(f)}{2}+c\,x\,\ln(f)}{\sqrt{c\,\ln(f)}}\right)}{\ln(f)\,\sqrt{c\,\ln(f)}}+\frac{2\,c\,f^a\,f^{c\,x^2}\,f^{b\,x}\,x}{\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x + c*x^2)*(b + 2*c*x)^2,x)
```

```
[Out] (b*f^a*f^(c*x^2)*f^(b*x))/log(f) - (c*f^(a - b^2/(4*c))*pi^(1/2)*erfi(((b*l
og(f))/2 + c*x*log(f))/(c*log(f))^(1/2)))/(log(f)*(c*log(f))^(1/2)) + (2*c*
f^a*f^(c*x^2)*f^(b*x)*x)/log(f)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{a+bx+cx^2}\,(b+2cx)^2\;dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*x**2+b*x+a)*(2*c*x+b)**2,x)
```

```
[Out] Integral(f**(a + b*x + c*x**2)*(b + 2*c*x)**2, x)
```

3.452 $\int f^{a+bx+cx^2}(b+2cx)\,dx$

Optimal. Leaf size=17

$$\frac{f^{a+bx+cx^2}}{\log(f)}$$

```
[Out] f^(c*x^2+b*x+a)/ln(f)
```

Rubi [A] time = 0.02, antiderivative size = 17, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.053, Rules used = {2236}

$$\frac{f^{a+bx+cx^2}}{\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x + c*x^2)*(b + 2*c*x),x]
```

```
[Out] f^(a + b*x + c*x^2)/Log[f]
```

Rule 2236

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_)), x_Symbol
] :> Simp[(e*F^(a + b*x + c*x^2))/(2*c*Log[F]), x] /; FreeQ[{F, a, b, c, d,
 e}, x] && EqQ[b*e - 2*c*d, 0]
```

Rubi steps

$$\int f^{a+bx+cx^2}(b+2cx)\,dx = \frac{f^{a+bx+cx^2}}{\log(f)}$$

Mathematica [A] time = 0.04, size = 17, normalized size = 1.00

$$\frac{f^{a+bx+cx^2}}{\log(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x + c*x^2)*(b + 2*c*x),x]
```

```
[Out] f^(a + b*x + c*x^2)/Log[f]
```

fricas [A] time = 0.41, size = 17, normalized size = 1.00

$$\frac{f^{cx^2+bx+a}}{\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*(2*c*x+b),x, algorithm="fricas")
```

```
[Out] f^(c*x^2 + b*x + a)/log(f)
```

giac [A] time = 0.38, size = 17, normalized size = 1.00

$$\frac{f^{cx^2+bx+a}}{\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*(2*c*x+b),x, algorithm="giac")
```

```
[Out] f^(c*x^2 + b*x + a)/log(f)
```

maple [A] time = 0.00, size = 18, normalized size = 1.06

$$\frac{f^{c\,x^2+bx+a}}{\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*x^2+b*x+a)*(2*c*x+b),x)
```

```
[Out] f^(c*x^2+b*x+a)/ln(f)
```

maxima [A] time = 0.78, size = 17, normalized size = 1.00

$$\frac{f^{cx^2+bx+a}}{\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)*(2*c*x+b),x, algorithm="maxima")
```

```
[Out] f^(c*x^2 + b*x + a)/log(f)
```

mupad [B] time = 3.62, size = 17, normalized size = 1.00

$$\frac{f^{c\,x^2+b\,x+a}}{\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x + c*x^2)*(b + 2*c*x),x)
```

```
[Out] f^(a + b*x + c*x^2)/log(f)
```

sympy [A] time = 0.12, size = 24, normalized size = 1.41

$$\begin{cases} \frac{f^{a+bx+cx^2}}{\log(f)} & \text{for } \log(f) \neq 0 \\ bx + cx^2 & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*x**2+b*x+a)*(2*c*x+b),x)
```

```
[Out] Piecewise((f**(a + b*x + c*x**2)/log(f), Ne(log(f), 0)), (b*x + c*x**2, Tru
e))
```

3.453 $\int \frac{f^{a+bx+cx^2}}{b+2cx} \, dx$

Optimal. Leaf size=39

$$\frac{f^{a-\frac{b^2}{4c}} \operatorname{Ei}\left(\frac{(b+2cx)^2 \log(f)}{4c}\right)}{4c}$$

```
[Out] 1/4*f^(a-1/4/c*b^2)*Ei(1/4*(2*c*x+b)^2*ln(f)/c)/c
```

Rubi [A] time = 0.04, antiderivative size = 39, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {2238}

$$\frac{f^{a-\frac{b^2}{4c}} \operatorname{Ei}\left(\frac{(b+2cx)^2 \log(f)}{4c}\right)}{4c}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x + c*x^2)/(b + 2*c*x),x]
```

```
[Out] (f^(a - b^2/(4*c))*ExpIntegralEi[((b + 2*c*x)^2*Log[f])/(4*c)])/(4*c)
```

Rule 2238

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)/((d_.) + (e_.)*(x_)), x_Symbol
] :> Simp[(1*F^(a - b^2/(4*c))*ExpIntegralEi[((b + 2*c*x)^2*Log[F])/(4*c)])
/(2*e), x] /; FreeQ[{F, a, b, c, d, e}, x] && EqQ[b*e - 2*c*d, 0]
```

Rubi steps

$$\int \frac{f^{a+bx+cx^2}}{b+2cx} \, dx = \frac{f^{a-\frac{b^2}{4c}} \operatorname{Ei}\left(\frac{(b+2cx)^2 \log(f)}{4c}\right)}{4c}$$

Mathematica [A] time = 0.05, size = 39, normalized size = 1.00

$$\frac{f^{a-\frac{b^2}{4c}} \operatorname{Ei}\left(\frac{(b+2cx)^2 \log(f)}{4c}\right)}{4c}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x + c*x^2)/(b + 2*c*x),x]
```

[Out] (f^(a - b^2/(4*c))*ExpIntegralEi[((b + 2*c*x)^2*Log[f])/(4*c)])/(4*c)

fricas [A] time = 0.42, size = 47, normalized size = 1.21

$$\frac{\text{Ei}\left(\frac{\left(4\,c^{2}x^{2}+4\,bcx+b^{2}\right)\log\left(f\right)}{4\,c}\right)}{4\,cf^{\frac{b^{2}-4\,ac}{4\,c}}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f^(c*x^2+b*x+a)/(2*c*x+b),x, algorithm="fricas")

[Out] 1/4*Ei(1/4*(4*c^2*x^2 + 4*b*c*x + b^2)*log(f)/c)/(c*f^(1/4*(b^2 - 4*a*c)/c)
)

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{cx^{2}+bx+a}}{2\,cx+b}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f^(c*x^2+b*x+a)/(2*c*x+b),x, algorithm="giac")

[Out] integrate(f^(c*x^2 + b*x + a)/(2*c*x + b), x)

maple [A] time = 0.04, size = 40, normalized size = 1.03

$$-\frac{f^{\frac{4ac-b^{2}}{4c}}\,\text{Ei}\left(1,-\frac{\left(2cx+b\right)^{2}\ln\left(f\right)}{4c}\right)}{4c}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(f^(c*x^2+b*x+a)/(2*c*x+b),x)

[Out] -1/4/c*f^(1/4*(4*a*c-b^2)/c)*Ei(1,-1/4*(2*c*x+b)^2*ln(f)/c)

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{cx^{2}+bx+a}}{2\,cx+b}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(f^(c*x^2+b*x+a)/(2*c*x+b),x, algorithm="maxima")

```
[Out] integrate(f^(c*x^2 + b*x + a)/(2*c*x + b), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{f^{c\,x^2+b\,x+a}}{b+2\,c\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x + c*x^2)/(b + 2*c*x),x)
[Out] int(f^(a + b*x + c*x^2)/(b + 2*c*x), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+bx+cx^2}}{b+2cx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*x**2+b*x+a)/(2*c*x+b),x)
[Out] Integral(f**(a + b*x + c*x**2)/(b + 2*c*x), x)
```

3.454 $\int \frac{f^{a+bx+cx^2}}{(b+2cx)^2} dx$

Optimal. Leaf size=84

$$\frac{\sqrt{\pi}\sqrt{\log(f)}\, f^{a-\frac{b^2}{4c}} \operatorname{erfi}\left(\frac{\sqrt{\log(f)}\,(b+2cx)}{2\sqrt{c}}\right)}{4c^{3/2}} - \frac{f^{a+bx+cx^2}}{2c(b+2cx)}$$

```
[Out] -1/2*f^(c*x^2+b*x+a)/c/(2*c*x+b)+1/4*f^(a-1/4/c*b^2)*erfi(1/2*(2*c*x+b)*ln(
f)^(1/2)/c^(1/2))*Pi^(1/2)*ln(f)^(1/2)/c^(3/2)
```

Rubi [A] time = 0.06, antiderivative size = 84, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2239, 2234, 2204}

$$\frac{\sqrt{\pi}\sqrt{\log(f)}\, f^{a-\frac{b^2}{4c}} \operatorname{Erfi}\left(\frac{\sqrt{\log(f)}\,(b+2cx)}{2\sqrt{c}}\right)}{4c^{3/2}} - \frac{f^{a+bx+cx^2}}{2c(b+2cx)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x + c*x^2)/(b + 2*c*x)^2,x]
```

```
[Out] -f^(a + b*x + c*x^2)/(2*c*(b + 2*c*x)) + (f^(a - b^2/(4*c))*Sqrt[Pi]*Erfi[(
(b + 2*c*x)*Sqrt[Log[f]])/(2*Sqrt[c])]*Sqrt[Log[f]])/(4*c^(3/2))
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2234

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2239

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_))^(m_), x_S
ymbol] :> Simp[((d + e*x)^(m + 1)*F^(a + b*x + c*x^2))/(e*(m + 1)), x] - Di
st[(2*c*Log[F])/(e^2*(m + 1)), Int[(d + e*x)^(m + 2)*F^(a + b*x + c*x^2), x
], x] /; FreeQ[{F, a, b, c, d, e}, x] && EqQ[b*e - 2*c*d, 0] && LtQ[m, -1]
```

Rubi steps

$$\int \frac{f^{a+bx+cx^2}}{(b+2cx)^2}\,dx = -\frac{f^{a+bx+cx^2}}{2c(b+2cx)} + \frac{\log(f)\int f^{a+bx+cx^2}\,dx}{2c}$$
$$= -\frac{f^{a+bx+cx^2}}{2c(b+2cx)} + \frac{\left(f^{a-\frac{b^2}{4c}}\log(f)\right)\int f^{\frac{(b+2cx)^2}{4c}}\,dx}{2c}$$
$$= -\frac{f^{a+bx+cx^2}}{2c(b+2cx)} + \frac{f^{a-\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)\sqrt{\log(f)}}{4c^{3/2}}$$

Mathematica [A] time = 0.11, size = 96, normalized size = 1.14

$$\frac{f^{a-\frac{b^2}{4c}}\left(\sqrt{\pi}\sqrt{\log(f)}\,(b+2cx)\mathrm{erfi}\left(\frac{\sqrt{\log(f)}\,(b+2cx)}{2\sqrt{c}}\right)-2\sqrt{c}\,f^{\frac{(b+2cx)^2}{4c}}\right)}{4c^{3/2}(b+2cx)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x + c*x^2)/(b + 2*c*x)^2,x]
```

```
[Out] (f^(a - b^2/(4*c))*(-2*Sqrt[c]*f^((b + 2*c*x)^2/(4*c)) + Sqrt[Pi]*(b + 2*c*
x)*Erfi[((b + 2*c*x)*Sqrt[Log[f]])/(2*Sqrt[c])]*Sqrt[Log[f]]))/(4*c^(3/2)*(
b + 2*c*x))
```

fricas [A] time = 0.44, size = 85, normalized size = 1.01

$$-\frac{2\,cf^{cx^2+bx+a} + \frac{\sqrt{\pi}\,(2\,cx+b)\sqrt{-c\log(f)}\,\mathrm{erf}\left(\frac{(2\,cx+b)\sqrt{-c\log(f)}}{2\,c}\right)}{f^{\frac{b^2-4\,ac}{4\,c}}}}{4\left(2\,c^3x+bc^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)/(2*c*x+b)^2,x, algorithm="fricas")
```

```
[Out] -1/4*(2*c*f^(c*x^2 + b*x + a) + sqrt(pi)*(2*c*x + b)*sqrt(-c*log(f))*erf(1/
2*(2*c*x + b)*sqrt(-c*log(f))/c)/f^(1/4*(b^2 - 4*a*c)/c))/(2*c^3*x + b*c^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{cx^2+bx+a}}{(2\,cx+b)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)/(2*c*x+b)^2,x, algorithm="giac")
```

```
[Out] integrate(f^(c*x^2 + b*x + a)/(2*c*x + b)^2, x)
```

maple [A] time = 0.09, size = 101, normalized size = 1.20

$$-\frac{f^{\frac{4ac-b^2}{4c}} f^{\frac{(2cx+b)^2}{4c}}}{2\,(2cx+b)\,c}+\frac{\sqrt{\pi}\, f^{\frac{4ac-b^2}{4c}} \operatorname{erf}\left(\frac{\sqrt{-\frac{\ln(f)}{c}}\,(2cx+b)}{2}\right)\ln(f)}{4\sqrt{-\frac{\ln(f)}{c}}\; c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*x^2+b*x+a)/(2*c*x+b)^2,x)
```

```
[Out] -1/2/c/(2*c*x+b)*f^(1/4*(2*c*x+b)^2/c)*f^(1/4*(4*a*c-b^2)/c)+1/4/c^2*ln(f)*
Pi^(1/2)*f^(1/4*(4*a*c-b^2)/c)/(-ln(f)/c)^(1/2)*erf(1/2*(-ln(f)/c)^(1/2)*(2
*c*x+b))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{cx^2+bx+a}}{(2\,cx+b)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)/(2*c*x+b)^2,x, algorithm="maxima")
```

```
[Out] integrate(f^(c*x^2 + b*x + a)/(2*c*x + b)^2, x)
```

mupad [B] time = 4.14, size = 76, normalized size = 0.90

$$\frac{f^{a-\frac{b^2}{4\,c}}\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{\frac{b\,\ln(f)}{2}+c\,x\,\ln(f)}{\sqrt{c\,\ln(f)}}\right)\ln(f)}{4\,c\,\sqrt{c\,\ln(f)}}-\frac{f^a\,f^{c\,x^2}\,f^{b\,x}}{2\,c\,(b+2\,c\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x + c*x^2)/(b + 2*c*x)^2,x)
```

```
[Out] (f^(a - b^2/(4*c))*pi^(1/2)*erfi(((b*log(f))/2 + c*x*log(f))/(c*log(f))^(1/
2))*log(f))/(4*c*(c*log(f))^(1/2)) - (f^a*f^(c*x^2)*f^(b*x))/(2*c*(b + 2*c*
x))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+bx+cx^2}}{(b+2cx)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*x**2+b*x+a)/(2*c*x+b)**2,x)
```

```
[Out] Integral(f**(a + b*x + c*x**2)/(b + 2*c*x)**2, x)
```

3.455 $\int \frac{f^{a+bx+cx^2}}{(b+2cx)^3}\,dx$

Optimal. Leaf size=69

$$\frac{\log(f)f^{a-\frac{b^2}{4c}}\text{Ei}\left(\frac{(b+2cx)^2\log(f)}{4c}\right)}{16c^2}-\frac{f^{a+bx+cx^2}}{4c(b+2cx)^2}$$

```
[Out] -1/4*f^(c*x^2+b*x+a)/c/(2*c*x+b)^2+1/16*f^(a-1/4/c*b^2)*Ei(1/4*(2*c*x+b)^2*
ln(f)/c)*ln(f)/c^2
```

Rubi [A] time = 0.07, antiderivative size = 69, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2239, 2238}

$$\frac{\log(f)f^{a-\frac{b^2}{4c}}\text{Ei}\left(\frac{(b+2cx)^2\log(f)}{4c}\right)}{16c^2}-\frac{f^{a+bx+cx^2}}{4c(b+2cx)^2}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x + c*x^2)/(b + 2*c*x)^3,x]
```

```
[Out] -f^(a + b*x + c*x^2)/(4*c*(b + 2*c*x)^2) + (f^(a - b^2/(4*c))*ExpIntegralEi
[((b + 2*c*x)^2*Log[f])/(4*c)]*Log[f])/(16*c^2)
```

Rule 2238

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)/((d_.) + (e_.)*(x_)), x_Symbol
] :> Simp[(1*F^(a - b^2/(4*c))*ExpIntegralEi[((b + 2*c*x)^2*Log[F])/(4*c)])
/(2*e), x] /; FreeQ[{F, a, b, c, d, e}, x] && EqQ[b*e - 2*c*d, 0]
```

Rule 2239

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_))^(m_), x_S
ymbol] :> Simp[((d + e*x)^(m + 1)*F^(a + b*x + c*x^2))/(e*(m + 1)), x] - Di
st[(2*c*Log[F])/(e^2*(m + 1)), Int[(d + e*x)^(m + 2)*F^(a + b*x + c*x^2), x
], x] /; FreeQ[{F, a, b, c, d, e}, x] && EqQ[b*e - 2*c*d, 0] && LtQ[m, -1]
```

Rubi steps

$$\int \frac{f^{a+bx+cx^2}}{(b+2cx)^3}\,dx = -\frac{f^{a+bx+cx^2}}{4c(b+2cx)^2} + \frac{\log(f)\int \frac{f^{a+bx+cx^2}}{b+2cx}\,dx}{4c}$$
$$= -\frac{f^{a+bx+cx^2}}{4c(b+2cx)^2} + \frac{f^{a-\frac{b^2}{4c}}\text{Ei}\left(\frac{(b+2cx)^2\log(f)}{4c}\right)\log(f)}{16c^2}$$

Mathematica [A] time = 0.09, size = 79, normalized size = 1.14

$$\frac{f^{a-\frac{b^2}{4c}}\left(\log(f)(b+2cx)^2\text{Ei}\left(\frac{(b+2cx)^2\log(f)}{4c}\right)-4cf^{\frac{(b+2cx)^2}{4c}}\right)}{16c^2(b+2cx)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x + c*x^2)/(b + 2*c*x)^3,x]
```

```
[Out] (f^(a - b^2/(4*c))*(-4*c*f^((b + 2*c*x)^2/(4*c)) + (b + 2*c*x)^2*ExpIntegra
lEi[((b + 2*c*x)^2*Log[f])/(4*c)]*Log[f]))/(16*c^2*(b + 2*c*x)^2)
```

fricas [A] time = 0.41, size = 106, normalized size = 1.54

$$-\frac{4\,cf^{cx^2+bx+a}-\frac{\left(4\,c^2x^2+4\,bcx+b^2\right)\text{Ei}\left(\frac{\left(4\,c^2x^2+4\,bcx+b^2\right)\log(f)}{4\,c}\right)\log(f)}{f^{\frac{b^2-4\,ac}{4\,c}}}}{16\left(4\,c^4x^2+4\,bc^3x+b^2c^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)/(2*c*x+b)^3,x, algorithm="fricas")
```

```
[Out] -1/16*(4*c*f^(c*x^2 + b*x + a) - (4*c^2*x^2 + 4*b*c*x + b^2)*Ei(1/4*(4*c^2*
x^2 + 4*b*c*x + b^2)*log(f)/c)*log(f)/f^(1/4*(b^2 - 4*a*c)/c))/(4*c^4*x^2 +
 4*b*c^3*x + b^2*c^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{cx^2+bx+a}}{(2\,cx+b)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)/(2*c*x+b)^3,x, algorithm="giac")
```

```
[Out] integrate(f^(c*x^2 + b*x + a)/(2*c*x + b)^3, x)
```

maple [A] time = 0.05, size = 88, normalized size = 1.28

$$-\frac{f^{\frac{4ac-b^2}{4c}} f^{\frac{(2cx+b)^2}{4c}}}{4\left(2cx+b\right)^2 c}-\frac{f^{\frac{4ac-b^2}{4c}} \operatorname{Ei}\left(1,-\frac{(2cx+b)^2 \ln(f)}{4c}\right) \ln(f)}{16c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*x^2+b*x+a)/(2*c*x+b)^3,x)
```

```
[Out] -1/4/c/(2*c*x+b)^2*f^(1/4*(2*c*x+b)^2/c)*f^(1/4*(4*a*c-b^2)/c)-1/16/c^2*ln(
f)*f^(1/4*(4*a*c-b^2)/c)*Ei(1,-1/4*(2*c*x+b)^2/c*ln(f))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{cx^2+bx+a}}{\left(2\,cx+b\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x+a)/(2*c*x+b)^3,x, algorithm="maxima")
```

```
[Out] integrate(f^(c*x^2 + b*x + a)/(2*c*x + b)^3, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{f^{c\,x^2+b\,x+a}}{{\left(b+2\,c\,x\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x + c*x^2)/(b + 2*c*x)^3,x)
```

```
[Out] int(f^(a + b*x + c*x^2)/(b + 2*c*x)^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{a+bx+cx^2}}{\left(b+2cx\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*x**2+b*x+a)/(2*c*x+b)**3,x)
```

```
[Out] Integral(f**(a + b*x + c*x**2)/(b + 2*c*x)**3, x)
```

3.456 $\int f^{bx+cx^2}(b+2cx)^3\,dx$

Optimal. Leaf size=43

$$\frac{(b+2cx)^2 f^{bx+cx^2}}{\log(f)}-\frac{4cf^{bx+cx^2}}{\log^2(f)}$$

```
[Out] -4*c*f^(c*x^2+b*x)/ln(f)^2+f^(c*x^2+b*x)*(2*c*x+b)^2/ln(f)
```

Rubi [A] time = 0.04, antiderivative size = 43, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {2237, 2236}

$$\frac{(b+2cx)^2 f^{bx+cx^2}}{\log(f)}-\frac{4cf^{bx+cx^2}}{\log^2(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(b*x + c*x^2)*(b + 2*c*x)^3,x]
```

```
[Out] (-4*c*f^(b*x + c*x^2))/Log[f]^2 + (f^(b*x + c*x^2)*(b + 2*c*x)^2)/Log[f]
```

Rule 2236

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_)), x_Symbol
] :> Simp[(e*F^(a + b*x + c*x^2))/(2*c*Log[F]), x] /; FreeQ[{F, a, b, c, d,
 e}, x] && EqQ[b*e - 2*c*d, 0]
```

Rule 2237

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_))^(m_), x_S
ymbol] :> Simp[(e*(d + e*x)^(m - 1)*F^(a + b*x + c*x^2))/(2*c*Log[F]), x] -
 Dist[((m - 1)*e^2)/(2*c*Log[F]), Int[(d + e*x)^(m - 2)*F^(a + b*x + c*x^2)
, x], x] /; FreeQ[{F, a, b, c, d, e}, x] && EqQ[b*e - 2*c*d, 0] && GtQ[m, 1
]
```

Rubi steps

$$\begin{aligned}\int f^{bx+cx^2}(b+2cx)^3\,dx &= \frac{f^{bx+cx^2}(b+2cx)^2}{\log(f)}-\frac{(4c)\int f^{bx+cx^2}(b+2cx)\,dx}{\log(f)}\\ &= -\frac{4cf^{bx+cx^2}}{\log^2(f)}+\frac{f^{bx+cx^2}(b+2cx)^2}{\log(f)}\end{aligned}$$

Mathematica [A] time = 0.10, size = 29, normalized size = 0.67

$$\frac{f^{x(b+cx)}\left(\log(f)(b+2cx)^2-4c\right)}{\log^2(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(b*x + c*x^2)*(b + 2*c*x)^3,x]
```

```
[Out] (f^(x*(b + c*x))*(-4*c + (b + 2*c*x)^2*Log[f]))/Log[f]^2
```

fricas [A] time = 0.41, size = 40, normalized size = 0.93

$$\frac{\left(\left(4\,c^2x^2+4\,bcx+b^2\right)\log(f)-4\,c\right)f^{cx^2+bx}}{\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x)*(2*c*x+b)^3,x, algorithm="fricas")
```

```
[Out] ((4*c^2*x^2 + 4*b*c*x + b^2)*log(f) - 4*c)*f^(c*x^2 + b*x)/log(f)^2
```

giac [B] time = 0.53, size = 726, normalized size = 16.88

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x)*(2*c*x+b)^3,x, algorithm="giac")
```

```
[Out] (2*((b^2*log(abs(f)) + 4*(c*x^2 + b*x)*c*log(abs(f)) - 4*c)*(pi^2*sgn(f) -
pi^2 + 2*log(abs(f))^2)/((pi^2*sgn(f) - pi^2 + 2*log(abs(f))^2)^2 + 4*(pi*l
og(abs(f))*sgn(f) - pi*log(abs(f)))^2) + (pi*b^2*sgn(f) + 4*pi*(c*x^2 + b*x
)*c*sgn(f) - pi*b^2 - 4*pi*(c*x^2 + b*x)*c)*(pi*log(abs(f))*sgn(f) - pi*log
(abs(f)))/((pi^2*sgn(f) - pi^2 + 2*log(abs(f))^2)^2 + 4*(pi*log(abs(f))*sgn
(f) - pi*log(abs(f)))^2))*cos(-1/2*pi*c*x^2*sgn(f) + 1/2*pi*c*x^2 - 1/2*pi*
b*x*sgn(f) + 1/2*pi*b*x) + ((pi*b^2*sgn(f) + 4*pi*(c*x^2 + b*x)*c*sgn(f) -
pi*b^2 - 4*pi*(c*x^2 + b*x)*c)*(pi^2*sgn(f) - pi^2 + 2*log(abs(f))^2)/((pi^
2*sgn(f) - pi^2 + 2*log(abs(f))^2)^2 + 4*(pi*log(abs(f))*sgn(f) - pi*log(ab
s(f)))^2) - 4*(b^2*log(abs(f)) + 4*(c*x^2 + b*x)*c*log(abs(f)) - 4*c)*(pi*l
og(abs(f))*sgn(f) - pi*log(abs(f)))/((pi^2*sgn(f) - pi^2 + 2*log(abs(f))^2)
^2 + 4*(pi*log(abs(f))*sgn(f) - pi*log(abs(f)))^2))*sin(-1/2*pi*c*x^2*sgn(f
) + 1/2*pi*c*x^2 - 1/2*pi*b*x*sgn(f) + 1/2*pi*b*x))*abs(f)^(c*x^2 + b*x) -
1/2*abs(f)^(c*x^2 + b*x)*((2*b^2*i*log(abs(f)) + 8*(c*x^2 + b*x)*c*i*log(ab
s(f)) - pi*b^2*sgn(f) - 4*pi*(c*x^2 + b*x)*c*sgn(f) + pi*b^2 + 4*pi*(c*x^2
+ b*x)*c - 8*c*i)*e^(1/2*pi*(c*x^2 + b*x)*i*(sgn(f) - 1))/(2*pi*i*log(abs(f
```

```
))*sgn(f) - 2*pi*i*log(abs(f)) + pi^2*sgn(f) - pi^2 + 2*log(abs(f))^2) + (2
*b^2*i*log(abs(f)) + 8*(c*x^2 + b*x)*c*i*log(abs(f)) + pi*b^2*sgn(f) + 4*pi
*(c*x^2 + b*x)*c*sgn(f) - pi*b^2 - 4*pi*(c*x^2 + b*x)*c - 8*c*i)*e^(-1/2*pi
*(c*x^2 + b*x)*i*(sgn(f) - 1))/(2*pi*i*log(abs(f))*sgn(f) - 2*pi*i*log(abs(
f)) - pi^2*sgn(f) + pi^2 - 2*log(abs(f))^2))/i
```

maple [A] time = 0.01, size = 44, normalized size = 1.02

$$\frac{\left(4c^2x^2\ln(f) + 4bcx\ln(f) + b^2\ln(f) - 4c\right)f^{c\,x^2+bx}}{\ln(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*x^2+b*x)*(2*c*x+b)^3,x)
```

```
[Out] (4*c^2*x^2*ln(f)+4*b*c*x*ln(f)+b^2*ln(f)-4*c)*f^(c*x^2+b*x)/ln(f)^2
```

maxima [C] time = 2.17, size = 536, normalized size = 12.47

$$\frac{\sqrt{\pi}\,b^3\operatorname{erf}\left(\sqrt{-c\log(f)}\,x - \frac{b\log(f)}{2\sqrt{-c\log(f)}}\right)}{2\sqrt{-c\log(f)}\,f^{\frac{b^2}{4c}}} - \frac{3\left(\frac{\sqrt{\pi}\,(2\,cx+b)b\left(\operatorname{erf}\left(\frac{1}{2}\sqrt{-\frac{(2\,cx+b)^2\log(f)}{c}}\right)-1\right)\log(f)^2}{\sqrt{-\frac{(2\,cx+b)^2\log(f)}{c}}\,\left(c\log(f)\right)^{\frac{3}{2}}} - \frac{2\,cf^{\frac{(2\,cx+b)^2}{4\,c}}\log(f)}{\left(c\log(f)\right)^{\frac{3}{2}}}\right)b^2c}{2\sqrt{c\log(f)}\,f^{\frac{b^2}{4c}}} + \frac{3\left(\frac{\sqrt{\pi}\,(\cdots}{\cdots}\right.}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x)*(2*c*x+b)^3,x, algorithm="maxima")
```

```
[Out] 1/2*sqrt(pi)*b^3*erf(sqrt(-c*log(f))*x - 1/2*b*log(f)/sqrt(-c*log(f)))/(sqr
t(-c*log(f))*f^(1/4*b^2/c)) - 3/2*(sqrt(pi)*(2*c*x + b)*b*(erf(1/2*sqrt(-(2
*c*x + b)^2*log(f)/c)) - 1)*log(f)^2/(sqrt(-(2*c*x + b)^2*log(f)/c)*(c*log(
f))^(3/2)) - 2*c*f^(1/4*(2*c*x + b)^2/c)*log(f)/(c*log(f))^(3/2))*b^2*c/(sq
rt(c*log(f))*f^(1/4*b^2/c)) + 3/2*(sqrt(pi)*(2*c*x + b)*b^2*(erf(1/2*sqrt(-
(2*c*x + b)^2*log(f)/c)) - 1)*log(f)^3/(sqrt(-(2*c*x + b)^2*log(f)/c)*(c*lo
g(f))^(5/2)) - 4*(2*c*x + b)^3*gamma(3/2, -1/4*(2*c*x + b)^2*log(f)/c)*log(
f)^3/((-(2*c*x + b)^2*log(f)/c)^(3/2)*(c*log(f))^(5/2)) - 4*b*c*f^(1/4*(2*c
*x + b)^2/c)*log(f)^2/(c*log(f))^(5/2))*b*c^2/(sqrt(c*log(f))*f^(1/4*b^2/c)
) - 1/2*(sqrt(pi)*(2*c*x + b)*b^3*(erf(1/2*sqrt(-(2*c*x + b)^2*log(f)/c)) -
 1)*log(f)^4/(sqrt(-(2*c*x + b)^2*log(f)/c)*(c*log(f))^(7/2)) - 12*(2*c*x +
 b)^3*b*gamma(3/2, -1/4*(2*c*x + b)^2*log(f)/c)*log(f)^4/((-(2*c*x + b)^2*l
og(f)/c)^(3/2)*(c*log(f))^(7/2)) - 6*b^2*c*f^(1/4*(2*c*x + b)^2/c)*log(f)^3
/(c*log(f))^(7/2) + 8*c^2*gamma(2, -1/4*(2*c*x + b)^2*log(f)/c)*log(f)^2/(c
*log(f))^(7/2))*c^3/(sqrt(c*log(f))*f^(1/4*b^2/c))
```

mupad [B] time = 3.69, size = 43, normalized size = 1.00

$$\frac{f^{c\,x^2+b\,x}\,\left(\ln(f)\,b^2+4\,\ln(f)\,b\,c\,x+4\,\ln(f)\,c^2\,x^2-4\,c\right)}{\ln(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x + c*x^2)*(b + 2*c*x)^3,x)
```

```
[Out] (f^(b*x + c*x^2)*(b^2*log(f) - 4*c + 4*c^2*x^2*log(f) + 4*b*c*x*log(f)))/lo
g(f)^2
```

sympy [A] time = 0.17, size = 83, normalized size = 1.93

$$\begin{cases} \frac{f^{bx+cx^2}\left(b^2\log(f)+4bcx\log(f)+4c^2x^2\log(f)-4c\right)}{\log(f)^2} & \text{for}\ \log(f)^2\neq 0 \\ b^3x+3b^2cx^2+4bc^2x^3+2c^3x^4 & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*x**2+b*x)*(2*c*x+b)**3,x)
```

```
[Out] Piecewise(((f**(b*x + c*x**2)*(b**2*log(f) + 4*b*c*x*log(f) + 4*c**2*x**2*lo
g(f) - 4*c)/log(f)**2, Ne(log(f)**2, 0)), (b**3*x + 3*b**2*c*x**2 + 4*b*c**
2*x**3 + 2*c**3*x**4, True))
```

3.457 $\int f^{bx+cx^2}(b+2cx)^2\,dx$

Optimal. Leaf size=75

$$\frac{(b+2cx)f^{bx+cx^2}}{\log(f)}-\frac{\sqrt{\pi}\sqrt{c}\,f^{-\frac{b^2}{4c}}\operatorname{erfi}\left(\frac{\sqrt{\log(f)}\,(b+2cx)}{2\sqrt{c}}\right)}{\log^{\frac{3}{2}}(f)}$$

```
[Out] f^(c*x^2+b*x)*(2*c*x+b)/ln(f)-erfi(1/2*(2*c*x+b)*ln(f)^(1/2)/c^(1/2))*c^(1/
2)*Pi^(1/2)/(f^(1/4/c*b^2))/ln(f)^(3/2)
```

Rubi [A] time = 0.06, antiderivative size = 75, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.150, Rules used = {2237, 2234, 2204}

$$\frac{(b+2cx)f^{bx+cx^2}}{\log(f)}-\frac{\sqrt{\pi}\sqrt{c}\,f^{-\frac{b^2}{4c}}\operatorname{Erfi}\left(\frac{\sqrt{\log(f)}\,(b+2cx)}{2\sqrt{c}}\right)}{\log^{\frac{3}{2}}(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(b*x + c*x^2)*(b + 2*c*x)^2,x]
```

```
[Out] -((Sqrt[c]*Sqrt[Pi]*Erfi[((b + 2*c*x)*Sqrt[Log[f]])/(2*Sqrt[c])])/(f^(b^2/(
4*c))*Log[f]^(3/2))) + (f^(b*x + c*x^2)*(b + 2*c*x))/Log[f]
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2234

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2237

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_))^(m_), x_S
ymbol] :> Simp[(e*(d + e*x)^(m - 1)*F^(a + b*x + c*x^2))/(2*c*Log[F]), x] -
 Dist[((m - 1)*e^2)/(2*c*Log[F]), Int[(d + e*x)^(m - 2)*F^(a + b*x + c*x^2)
, x], x] /; FreeQ[{F, a, b, c, d, e}, x] && EqQ[b*e - 2*c*d, 0] && GtQ[m, 1
]
```

Rubi steps

$$\int f^{bx+cx^2}(b+2cx)^2\,dx=\frac{f^{bx+cx^2}(b+2cx)}{\log(f)}-\frac{(2c)\int f^{bx+cx^2}\,dx}{\log(f)}$$
$$=\frac{f^{bx+cx^2}(b+2cx)}{\log(f)}-\frac{\left(2cf^{-\frac{b^2}{4c}}\right)\int f^{\frac{(b+2cx)^2}{4c}}\,dx}{\log(f)}$$
$$=-\frac{\sqrt{c}\,f^{-\frac{b^2}{4c}}\sqrt{\pi}\,\mathrm{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)}{\log^{\frac{3}{2}}(f)}+\frac{f^{bx+cx^2}(b+2cx)}{\log(f)}$$

Mathematica [A] time = 0.07, size = 84, normalized size = 1.12

$$\frac{f^{-\frac{b^2}{4c}}\left(\sqrt{\log(f)}\,(b+2cx)f^{\frac{(b+2cx)^2}{4c}}-\sqrt{\pi}\,\sqrt{c}\,\mathrm{erfi}\left(\frac{\sqrt{\log(f)}\,(b+2cx)}{2\sqrt{c}}\right)\right)}{\log^{\frac{3}{2}}(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(b*x + c*x^2)*(b + 2*c*x)^2,x]
```

```
[Out] (-(Sqrt[c]*Sqrt[Pi]*Erfi[((b + 2*c*x)*Sqrt[Log[f]])/(2*Sqrt[c])]) + f^((b +
 2*c*x)^2/(4*c))*(b + 2*c*x)*Sqrt[Log[f]])/(f^(b^2/(4*c))*Log[f]^(3/2))
```

fricas [A] time = 0.42, size = 68, normalized size = 0.91

$$\frac{(2\,cx+b)f^{cx^2+bx}\log(f)+\frac{\sqrt{\pi}\,\sqrt{-c\log(f)}\,\mathrm{erf}\left(\frac{(2\,cx+b)\sqrt{-c\log(f)}}{2\,c}\right)}{f^{\frac{b^2}{4\,c}}}}{\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x)*(2*c*x+b)^2,x, algorithm="fricas")
```

```
[Out] ((2*c*x + b)*f^(c*x^2 + b*x)*log(f) + sqrt(pi)*sqrt(-c*log(f))*erf(1/2*(2*c
*x + b)*sqrt(-c*log(f))/c)/f^(1/4*b^2/c))/log(f)^2
```

giac [A] time = 0.46, size = 77, normalized size = 1.03

$$\frac{c\left(2\,x+\frac{b}{c}\right)e^{\left(cx^2\log(f)+bx\log(f)\right)}}{\log(f)}+\frac{\sqrt{\pi}\,c\,\mathrm{erf}\left(-\frac{1}{2}\,\sqrt{-c\log(f)}\left(2\,x+\frac{b}{c}\right)\right)}{\sqrt{-c\log(f)}\,f^{\frac{b^2}{4\,c}}\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x)*(2*c*x+b)^2,x, algorithm="giac")
```

```
[Out] c*(2*x + b/c)*e^(c*x^2*log(f) + b*x*log(f))/log(f) + sqrt(pi)*c*erf(-1/2*sq
rt(-c*log(f))*(2*x + b/c))/(sqrt(-c*log(f))*f^(1/4*b^2/c)*log(f))
```

maple [A] time = 0.07, size = 90, normalized size = 1.20

$$\frac{2cx\,f^{bx}f^{c\,x^2}}{\ln(f)}+\frac{b\,f^{bx}f^{c\,x^2}}{\ln(f)}+\frac{\sqrt{\pi}\,c\,f^{-\frac{b^2}{4c}}\operatorname{erf}\left(\frac{b\ln(f)}{2\sqrt{-c\ln(f)}}-\sqrt{-c\ln(f)}\,x\right)}{\sqrt{-c\ln(f)}\,\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*x^2+b*x)*(2*c*x+b)^2,x)
```

```
[Out] 2*c/ln(f)*x*f^(c*x^2)*f^(b*x)+b/ln(f)*f^(c*x^2)*f^(b*x)+c/ln(f)*Pi^(1/2)*f^
(-1/4*b^2/c)/(-c*ln(f))^(1/2)*erf(1/2/(-c*ln(f))^(1/2)*b*ln(f)-(-c*ln(f))^(
1/2)*x)
```

maxima [B] time = 1.04, size = 329, normalized size = 4.39

$$\frac{\sqrt{\pi}\,b^2\operatorname{erf}\left(\sqrt{-c\log(f)}\,x-\frac{b\log(f)}{2\sqrt{-c\log(f)}}\right)}{2\sqrt{-c\log(f)}\,f^{\frac{b^2}{4c}}}-\frac{\left(\frac{\sqrt{\pi}\,(2\,cx+b)b\left(\operatorname{erf}\left(\frac{1}{2}\sqrt{-\frac{(2\,cx+b)^2\log(f)}{c}}\right)-1\right)\log(f)^2}{\sqrt{-\frac{(2\,cx+b)^2\log(f)}{c}}\left(c\log(f)\right)^{\frac{3}{2}}}-\frac{2\,cf^{\frac{(2\,cx+b)^2}{4\,c}}\log(f)}{\left(c\log(f)\right)^{\frac{3}{2}}}\right)bc}{\sqrt{c\log(f)}\,f^{\frac{b^2}{4c}}}+\frac{\left(\sqrt{\pi}\,(2\,cx+\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x)*(2*c*x+b)^2,x, algorithm="maxima")
```

```
[Out] 1/2*sqrt(pi)*b^2*erf(sqrt(-c*log(f))*x - 1/2*b*log(f)/sqrt(-c*log(f)))/(sqr
t(-c*log(f))*f^(1/4*b^2/c)) - (sqrt(pi)*(2*c*x + b)*b*(erf(1/2*sqrt(-(2*c*x
 + b)^2*log(f)/c)) - 1)*log(f)^2/(sqrt(-(2*c*x + b)^2*log(f)/c)*(c*log(f))^
(3/2)) - 2*c*f^(1/4*(2*c*x + b)^2/c)*log(f)/(c*log(f))^(3/2))*b*c/(sqrt(c*l
og(f))*f^(1/4*b^2/c)) + 1/2*(sqrt(pi)*(2*c*x + b)*b^2*(erf(1/2*sqrt(-(2*c*x
 + b)^2*log(f)/c)) - 1)*log(f)^3/(sqrt(-(2*c*x + b)^2*log(f)/c)*(c*log(f))^
(5/2)) - 4*(2*c*x + b)^3*gamma(3/2, -1/4*(2*c*x + b)^2*log(f)/c)*log(f)^3/(
(-(2*c*x + b)^2*log(f)/c)^(3/2)*(c*log(f))^(5/2)) - 4*b*c*f^(1/4*(2*c*x + b
)^2/c)*log(f)^2/(c*log(f))^(5/2))*c^2/(sqrt(c*log(f))*f^(1/4*b^2/c))
```

mupad [B] time = 3.65, size = 86, normalized size = 1.15

$$\frac{b\,f^{c\,x^2}\,f^{b\,x}}{\ln(f)}+\frac{2\,c\,f^{c\,x^2}\,f^{b\,x}\,x}{\ln(f)}-\frac{c\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\frac{b\,\ln(f)}{2}+c\,x\,\ln(f)}{\sqrt{c\,\ln(f)}}\right)}{f^{\frac{b^2}{4\,c}}\,\ln(f)\,\sqrt{c\,\ln(f)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x + c*x^2)*(b + 2*c*x)^2,x)
```

```
[Out] (b*f^(c*x^2)*f^(b*x))/log(f) + (2*c*f^(c*x^2)*f^(b*x)*x)/log(f) - (c*pi^(1/
2)*erfi(((b*log(f))/2 + c*x*log(f))/(c*log(f))^(1/2)))/(f^(b^2/(4*c))*log(f
)*(c*log(f))^(1/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{bx+cx^2}\,(b+2cx)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*x**2+b*x)*(2*c*x+b)**2,x)
```

```
[Out] Integral(f**(b*x + c*x**2)*(b + 2*c*x)**2, x)
```

3.458 $\int f^{bx+cx^2}(b+2cx)\,dx$

Optimal. Leaf size=16

$$\frac{f^{bx+cx^2}}{\log(f)}$$

```
[Out] f^(c*x^2+b*x)/ln(f)
```

Rubi [A] time = 0.01, antiderivative size = 16, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.056, Rules used = {2236}

$$\frac{f^{bx+cx^2}}{\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(b*x + c*x^2)*(b + 2*c*x),x]
```

```
[Out] f^(b*x + c*x^2)/Log[f]
```

Rule 2236

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_)), x_Symbol
] :> Simp[(e*F^(a + b*x + c*x^2))/(2*c*Log[F]), x] /; FreeQ[{F, a, b, c, d,
 e}, x] && EqQ[b*e - 2*c*d, 0]
```

Rubi steps

$$\int f^{bx+cx^2}(b+2cx)\,dx = \frac{f^{bx+cx^2}}{\log(f)}$$

Mathematica [A] time = 0.03, size = 16, normalized size = 1.00

$$\frac{f^{bx+cx^2}}{\log(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(b*x + c*x^2)*(b + 2*c*x),x]
```

```
[Out] f^(b*x + c*x^2)/Log[f]
```

fricas [A] time = 0.42, size = 16, normalized size = 1.00

$$\frac{f^{cx^2+bx}}{\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x)*(2*c*x+b),x, algorithm="fricas")
```

```
[Out] f^(c*x^2 + b*x)/log(f)
```

giac [A] time = 0.30, size = 16, normalized size = 1.00

$$\frac{f^{cx^2+bx}}{\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x)*(2*c*x+b),x, algorithm="giac")
```

```
[Out] f^(c*x^2 + b*x)/log(f)
```

maple [A] time = 0.01, size = 17, normalized size = 1.06

$$\frac{f^{c\,x^2+bx}}{\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*x^2+b*x)*(2*c*x+b),x)
```

```
[Out] f^(c*x^2+b*x)/ln(f)
```

maxima [A] time = 0.85, size = 16, normalized size = 1.00

$$\frac{f^{cx^2+bx}}{\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x)*(2*c*x+b),x, algorithm="maxima")
```

```
[Out] f^(c*x^2 + b*x)/log(f)
```

mupad [B] time = 3.52, size = 16, normalized size = 1.00

$$\frac{f^{c\,x^2+b\,x}}{\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x + c*x^2)*(b + 2*c*x),x)
```

```
[Out] f^(b*x + c*x^2)/log(f)
```

sympy [A] time = 0.12, size = 22, normalized size = 1.38

$$\begin{cases} \frac{f^{bx+cx^2}}{\log(f)} & \text{for } \log(f) \neq 0 \\ bx + cx^2 & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*x**2+b*x)*(2*c*x+b),x)
```

```
[Out] Piecewise((f**(b*x + c*x**2)/log(f), Ne(log(f), 0)), (b*x + c*x**2, True))
```

3.459 $\int \frac{f^{bx+cx^2}}{b+2cx} dx$

Optimal. Leaf size=37

$$\frac{f^{-\frac{b^2}{4c}} \operatorname{Ei}\left(\frac{(b+2cx)^2 \log(f)}{4c}\right)}{4c}$$

```
[Out] 1/4*Ei(1/4*(2*c*x+b)^2*ln(f)/c)/c/(f^(1/4/c*b^2))
```

Rubi [A] time = 0.03, antiderivative size = 37, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.050, Rules used = {2238}

$$\frac{f^{-\frac{b^2}{4c}} \operatorname{Ei}\left(\frac{(b+2cx)^2 \log(f)}{4c}\right)}{4c}$$

Antiderivative was successfully verified.

```
[In] Int[f^(b*x + c*x^2)/(b + 2*c*x),x]
```

```
[Out] ExpIntegralEi[((b + 2*c*x)^2*Log[f])/(4*c)]/(4*c*f^(b^2/(4*c)))
```

Rule 2238

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)/((d_.) + (e_.)*(x_)), x_Symbol
] :> Simp[(1*F^(a - b^2/(4*c))*ExpIntegralEi[((b + 2*c*x)^2*Log[F])/(4*c)])
/(2*e), x] /; FreeQ[{F, a, b, c, d, e}, x] && EqQ[b*e - 2*c*d, 0]
```

Rubi steps

$$\int \frac{f^{bx+cx^2}}{b+2cx} dx = \frac{f^{-\frac{b^2}{4c}} \operatorname{Ei}\left(\frac{(b+2cx)^2 \log(f)}{4c}\right)}{4c}$$

Mathematica [A] time = 0.04, size = 37, normalized size = 1.00

$$\frac{f^{-\frac{b^2}{4c}} \operatorname{Ei}\left(\frac{(b+2cx)^2 \log(f)}{4c}\right)}{4c}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(b*x + c*x^2)/(b + 2*c*x),x]
```

```
[Out] ExpIntegralEi[((b + 2*c*x)^2*Log[f])/(4*c)]/(4*c*f^(b^2/(4*c)))
```

fricas [A] time = 0.41, size = 42, normalized size = 1.14

$$\frac{\operatorname{Ei}\left(\frac{\left(4\,c^2x^2+4\,bcx+b^2\right)\log\left(f\right)}{4\,c}\right)}{4\,cf^{\frac{b^2}{4\,c}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x)/(2*c*x+b),x, algorithm="fricas")
[Out] 1/4*Ei(1/4*(4*c^2*x^2 + 4*b*c*x + b^2)*log(f)/c)/(c*f^(1/4*b^2/c))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{cx^2+bx}}{2\,cx+b}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x)/(2*c*x+b),x, algorithm="giac")
[Out] integrate(f^(c*x^2 + b*x)/(2*c*x + b), x)
```

maple [A] time = 0.04, size = 33, normalized size = 0.89

$$-\frac{f^{-\frac{b^2}{4c}}\operatorname{Ei}\left(1,-\frac{(2cx+b)^2\ln(f)}{4c}\right)}{4c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*x^2+b*x)/(2*c*x+b),x)
[Out] -1/4/c*f^(-1/4*b^2/c)*Ei(1,-1/4*(2*c*x+b)^2/c*ln(f))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{cx^2+bx}}{2\,cx+b}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x)/(2*c*x+b),x, algorithm="maxima")
[Out] integrate(f^(c*x^2 + b*x)/(2*c*x + b), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{f^{c\,x^2+b\,x}}{b+2\,c\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x + c*x^2)/(b + 2*c*x),x)
```

```
[Out] int(f^(b*x + c*x^2)/(b + 2*c*x), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{bx+cx^2}}{b+2cx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*x**2+b*x)/(2*c*x+b),x)
```

```
[Out] Integral(f**(b*x + c*x**2)/(b + 2*c*x), x)
```

3.460 $\int \frac{f^{bx+cx^2}}{(b+2cx)^2}\,dx$

Optimal. Leaf size=81

$$\frac{\sqrt{\pi}\,\sqrt{\log(f)}\,f^{-\frac{b^2}{4c}}\operatorname{erfi}\left(\frac{\sqrt{\log(f)}\,(b+2cx)}{2\sqrt{c}}\right)}{4c^{3/2}}-\frac{f^{bx+cx^2}}{2c(b+2cx)}$$

```
[Out] -1/2*f^(c*x^2+b*x)/c/(2*c*x+b)+1/4*erfi(1/2*(2*c*x+b)*ln(f)^(1/2)/c^(1/2))*
Pi^(1/2)*ln(f)^(1/2)/c^(3/2)/(f^(1/4/c*b^2))
```

Rubi [A] time = 0.05, antiderivative size = 81, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.150, Rules used = {2239, 2234, 2204}

$$\frac{\sqrt{\pi}\,\sqrt{\log(f)}\,f^{-\frac{b^2}{4c}}\operatorname{Erfi}\left(\frac{\sqrt{\log(f)}\,(b+2cx)}{2\sqrt{c}}\right)}{4c^{3/2}}-\frac{f^{bx+cx^2}}{2c(b+2cx)}$$

Antiderivative was successfully verified.

```
[In] Int[f^(b*x + c*x^2)/(b + 2*c*x)^2,x]
```

```
[Out] -f^(b*x + c*x^2)/(2*c*(b + 2*c*x)) + (Sqrt[Pi]*Erfi[((b + 2*c*x)*Sqrt[Log[f
]])/(2*Sqrt[c])]*Sqrt[Log[f]])/(4*c^(3/2)*f^(b^2/(4*c)))
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2234

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2239

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_))^(m_), x_S
ymbol] :> Simp[((d + e*x)^(m + 1)*F^(a + b*x + c*x^2))/(e*(m + 1)), x] - Di
st[(2*c*Log[F])/(e^2*(m + 1)), Int[(d + e*x)^(m + 2)*F^(a + b*x + c*x^2), x
], x] /; FreeQ[{F, a, b, c, d, e}, x] && EqQ[b*e - 2*c*d, 0] && LtQ[m, -1]
```

Rubi steps

$$\int \frac{f^{bx+cx^2}}{(b+2cx)^2}\,dx = -\frac{f^{bx+cx^2}}{2c(b+2cx)} + \frac{\log(f)\int f^{bx+cx^2}\,dx}{2c}$$
$$= -\frac{f^{bx+cx^2}}{2c(b+2cx)} + \frac{\left(f^{-\frac{b^2}{4c}}\log(f)\right)\int f^{\frac{(b+2cx)^2}{4c}}\,dx}{2c}$$
$$= -\frac{f^{bx+cx^2}}{2c(b+2cx)} + \frac{f^{-\frac{b^2}{4c}}\sqrt{\pi}\,\text{erfi}\left(\frac{(b+2cx)\sqrt{\log(f)}}{2\sqrt{c}}\right)\sqrt{\log(f)}}{4c^{3/2}}$$

Mathematica [A] time = 0.06, size = 94, normalized size = 1.16

$$\frac{f^{-\frac{b^2}{4c}}\left(\sqrt{\pi}\sqrt{\log(f)}\,(b+2cx)\text{erfi}\left(\frac{\sqrt{\log(f)}\,(b+2cx)}{2\sqrt{c}}\right)-2\sqrt{c}\,f^{\frac{(b+2cx)^2}{4c}}\right)}{4c^{3/2}(b+2cx)}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(b*x + c*x^2)/(b + 2*c*x)^2,x]
```

```
[Out] (-2*Sqrt[c]*f^((b + 2*c*x)^2/(4*c)) + Sqrt[Pi]*(b + 2*c*x)*Erfi[((b + 2*c*x
)*Sqrt[Log[f]])/(2*Sqrt[c])]*Sqrt[Log[f]])/(4*c^(3/2)*f^(b^2/(4*c))*(b + 2*
c*x))
```

fricas [A] time = 0.42, size = 79, normalized size = 0.98

$$-\frac{2\,cf^{cx^2+bx}+\frac{\sqrt{\pi}\,(2\,cx+b)\sqrt{-c\log(f)}\,\text{erf}\left(\frac{(2\,cx+b)\sqrt{-c\log(f)}}{2\,c}\right)}{f^{\frac{b^2}{4\,c}}}}{4\left(2\,c^3x+bc^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x)/(2*c*x+b)^2,x, algorithm="fricas")
```

```
[Out] -1/4*(2*c*f^(c*x^2 + b*x) + sqrt(pi)*(2*c*x + b)*sqrt(-c*log(f))*erf(1/2*(2
*c*x + b)*sqrt(-c*log(f))/c)/f^(1/4*b^2/c))/(2*c^3*x + b*c^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{cx^2+bx}}{(2\,cx+b)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x)/(2*c*x+b)^2,x, algorithm="giac")
```

```
[Out] integrate(f^(c*x^2 + b*x)/(2*c*x + b)^2, x)
```

maple [A] time = 0.06, size = 87, normalized size = 1.07

$$-\frac{f^{-\frac{b^2}{4c}} f^{\frac{(2cx+b)^2}{4c}}}{2\,(2cx+b)\,c}+\frac{\sqrt{\pi}\,f^{-\frac{b^2}{4c}}\,\mathrm{erf}\left(\frac{\sqrt{-\frac{\ln(f)}{c}}\,(2cx+b)}{2}\right)\ln(f)}{4\sqrt{-\frac{\ln(f)}{c}}\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*x^2+b*x)/(2*c*x+b)^2,x)
```

```
[Out] -1/2/c/(2*c*x+b)*f^(1/4*(2*c*x+b)^2/c)*f^(-1/4*b^2/c)+1/4/c^2*ln(f)*Pi^(1/2
)*f^(-1/4*b^2/c)/(-1/c*ln(f))^(1/2)*erf(1/2*(-1/c*ln(f))^(1/2)*(2*c*x+b))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{cx^2+bx}}{(2\,cx+b)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x)/(2*c*x+b)^2,x, algorithm="maxima")
```

```
[Out] integrate(f^(c*x^2 + b*x)/(2*c*x + b)^2, x)
```

mupad [B] time = 3.78, size = 73, normalized size = 0.90

$$\frac{\sqrt{\pi}\,\mathrm{erfi}\left(\frac{\frac{b\,\ln(f)}{2}+c\,x\,\ln(f)}{\sqrt{c\,\ln(f)}}\right)\ln(f)}{4\,c\,f^{\frac{b^2}{4\,c}}\,\sqrt{c\,\ln(f)}}-\frac{f^{c\,x^2}\,f^{b\,x}}{2\,c\,(b+2\,c\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x + c*x^2)/(b + 2*c*x)^2,x)
```

```
[Out] (pi^(1/2)*erfi(((b*log(f))/2 + c*x*log(f))/(c*log(f))^(1/2))*log(f))/(4*c*f
^(b^2/(4*c))*(c*log(f))^(1/2)) - (f^(c*x^2)*f^(b*x))/(2*c*(b + 2*c*x))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{bx+cx^2}}{(b+2cx)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*x**2+b*x)/(2*c*x+b)**2,x)
```

```
[Out] Integral(f**(b*x + c*x**2)/(b + 2*c*x)**2, x)
```

3.461 $\int \frac{f^{bx+cx^2}}{(b+2cx)^3}\,dx$

Optimal. Leaf size=66

$$\frac{\log(f)f^{-\frac{b^2}{4c}}\operatorname{Ei}\left(\frac{(b+2cx)^2\log(f)}{4c}\right)}{16c^2}-\frac{f^{bx+cx^2}}{4c(b+2cx)^2}$$

```
[Out] -1/4*f^(c*x^2+b*x)/c/(2*c*x+b)^2+1/16*Ei(1/4*(2*c*x+b)^2*ln(f)/c)*ln(f)/c^2
/(f^(1/4/c*b^2))
```

Rubi [A] time = 0.06, antiderivative size = 66, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {2239, 2238}

$$\frac{\log(f)f^{-\frac{b^2}{4c}}\operatorname{Ei}\left(\frac{(b+2cx)^2\log(f)}{4c}\right)}{16c^2}-\frac{f^{bx+cx^2}}{4c(b+2cx)^2}$$

Antiderivative was successfully verified.

```
[In] Int[f^(b*x + c*x^2)/(b + 2*c*x)^3,x]
```

```
[Out] -f^(b*x + c*x^2)/(4*c*(b + 2*c*x)^2) + (ExpIntegralEi[((b + 2*c*x)^2*Log[f]
)/(4*c)]*Log[f])/(16*c^2*f^(b^2/(4*c)))
```

Rule 2238

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)/((d_.) + (e_.)*(x_)), x_Symbol
] :> Simp[(1*F^(a - b^2/(4*c))*ExpIntegralEi[((b + 2*c*x)^2*Log[F])/(4*c)])
/(2*e), x] /; FreeQ[{F, a, b, c, d, e}, x] && EqQ[b*e - 2*c*d, 0]
```

Rule 2239

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_))^(m_), x_S
ymbol] :> Simp[((d + e*x)^(m + 1)*F^(a + b*x + c*x^2))/(e*(m + 1)), x] - Di
st[(2*c*Log[F])/(e^2*(m + 1)), Int[(d + e*x)^(m + 2)*F^(a + b*x + c*x^2), x
], x] /; FreeQ[{F, a, b, c, d, e}, x] && EqQ[b*e - 2*c*d, 0] && LtQ[m, -1]
```

Rubi steps

$$\int \frac{f^{bx+cx^2}}{(b+2cx)^3}\,dx = -\frac{f^{bx+cx^2}}{4c(b+2cx)^2} + \frac{\log(f)\int \frac{f^{bx+cx^2}}{b+2cx}\,dx}{4c}$$
$$= -\frac{f^{bx+cx^2}}{4c(b+2cx)^2} + \frac{f^{-\frac{b^2}{4c}}\operatorname{Ei}\left(\frac{(b+2cx)^2\log(f)}{4c}\right)\log(f)}{16c^2}$$

Mathematica [A] time = 0.07, size = 77, normalized size = 1.17

$$\frac{f^{-\frac{b^2}{4c}}\left(\log(f)(b+2cx)^2\operatorname{Ei}\left(\frac{(b+2cx)^2\log(f)}{4c}\right) - 4cf^{\frac{(b+2cx)^2}{4c}}\right)}{16c^2(b+2cx)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(b*x + c*x^2)/(b + 2*c*x)^3,x]
```

```
[Out] (-4*c*f^((b + 2*c*x)^2/(4*c)) + (b + 2*c*x)^2*ExpIntegralEi[((b + 2*c*x)^2*
Log[f])/(4*c)]*Log[f])/(16*c^2*f^(b^2/(4*c))*(b + 2*c*x)^2)
```

fricas [A] time = 0.41, size = 100, normalized size = 1.52

$$-\frac{4\,cf^{cx^2+bx} - \frac{\left(4\,c^2x^2+4\,bcx+b^2\right)\operatorname{Ei}\left(\frac{\left(4\,c^2x^2+4\,bcx+b^2\right)\log(f)}{4\,c}\right)\log(f)}{f^{\frac{b^2}{4\,c}}}}{16\left(4\,c^4x^2+4\,bc^3x+b^2c^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x)/(2*c*x+b)^3,x, algorithm="fricas")
```

```
[Out] -1/16*(4*c*f^(c*x^2 + b*x) - (4*c^2*x^2 + 4*b*c*x + b^2)*Ei(1/4*(4*c^2*x^2
+ 4*b*c*x + b^2)*log(f)/c)*log(f)/f^(1/4*b^2/c))/(4*c^4*x^2 + 4*b*c^3*x + b
^2*c^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{cx^2+bx}}{(2\,cx+b)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x)/(2*c*x+b)^3,x, algorithm="giac")
[Out] integrate(f^(c*x^2 + b*x)/(2*c*x + b)^3, x)
```

maple [A] time = 0.05, size = 74, normalized size = 1.12

$$-\frac{f^{-\frac{b^2}{4c}} f^{\frac{(2cx+b)^2}{4c}}}{4\,(2cx+b)^2\,c}-\frac{f^{-\frac{b^2}{4c}}\,\mathrm{Ei}\left(1,-\frac{(2cx+b)^2\ln(f)}{4c}\right)\ln(f)}{16c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(c*x^2+b*x)/(2*c*x+b)^3,x)
[Out] -1/4/c/(2*c*x+b)^2*f^(1/4*(2*c*x+b)^2/c)*f^(-1/4*b^2/c)-1/16/c^2*ln(f)*f^(-
1/4*b^2/c)*Ei(1,-1/4*(2*c*x+b)^2/c*ln(f))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{cx^2+bx}}{(2\,cx+b)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(c*x^2+b*x)/(2*c*x+b)^3,x, algorithm="maxima")
[Out] integrate(f^(c*x^2 + b*x)/(2*c*x + b)^3, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{f^{c\,x^2+b\,x}}{(b+2\,c\,x)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x + c*x^2)/(b + 2*c*x)^3,x)
[Out] int(f^(b*x + c*x^2)/(b + 2*c*x)^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f^{bx+cx^2}}{(b+2cx)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(c*x**2+b*x)/(2*c*x+b)**3,x)
[Out] Integral(f**(b*x + c*x**2)/(b + 2*c*x)**3, x)
```

3.462 $\int \frac{e^{a+bx}}{x^2(c+dx^2)}\,dx$

Optimal. Leaf size=145

$$\frac{\sqrt{d}\,e^{a+\frac{b\sqrt{-c}}{\sqrt{d}}}\,\mathrm{Ei}\left(-\frac{b\left(\sqrt{-c}-\sqrt{d}\,x\right)}{\sqrt{d}}\right)}{2(-c)^{3/2}}-\frac{\sqrt{d}\,e^{a-\frac{b\sqrt{-c}}{\sqrt{d}}}\,\mathrm{Ei}\left(\frac{b\left(\sqrt{d}\,x+\sqrt{-c}\right)}{\sqrt{d}}\right)}{2(-c)^{3/2}}+\frac{e^a b\mathrm{Ei}(bx)}{c}-\frac{e^{a+bx}}{cx}$$

```
[Out] -exp(b*x+a)/c/x+b*exp(a)*Ei(b*x)/c+1/2*exp(a+b*(-c)^(1/2)/d^(1/2))*Ei(-b*((
-c)^(1/2)-x*d^(1/2))/d^(1/2))*d^(1/2)/(-c)^(3/2)-1/2*exp(a-b*(-c)^(1/2)/d^(
1/2))*Ei(b*((-c)^(1/2)+x*d^(1/2))/d^(1/2))*d^(1/2)/(-c)^(3/2)
```

Rubi [A] time = 0.35, antiderivative size = 145, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 4, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2271, 2177, 2178, 2269}

$$\frac{\sqrt{d}\,e^{a+\frac{b\sqrt{-c}}{\sqrt{d}}}\,\mathrm{Ei}\left(-\frac{b\left(\sqrt{-c}-\sqrt{d}\,x\right)}{\sqrt{d}}\right)}{2(-c)^{3/2}}-\frac{\sqrt{d}\,e^{a-\frac{b\sqrt{-c}}{\sqrt{d}}}\,\mathrm{Ei}\left(\frac{b\left(\sqrt{d}\,x+\sqrt{-c}\right)}{\sqrt{d}}\right)}{2(-c)^{3/2}}+\frac{e^a b\mathrm{Ei}(bx)}{c}-\frac{e^{a+bx}}{cx}$$

Antiderivative was successfully verified.

```
[In] Int[E^(a + b*x)/(x^2*(c + d*x^2)),x]
```

```
[Out] -(E^(a + b*x)/(c*x)) + (b*E^a*ExpIntegralEi[b*x])/c + (Sqrt[d]*E^(a + (b*Sq
rt[-c])/Sqrt[d])*ExpIntegralEi[-((b*(Sqrt[-c] - Sqrt[d]*x))/Sqrt[d])])/(2*(
-c)^(3/2)) - (Sqrt[d]*E^(a - (b*Sqrt[-c])/Sqrt[d])*ExpIntegralEi[(b*(Sqrt[-
c] + Sqrt[d]*x))/Sqrt[d]])/(2*(-c)^(3/2))
```

Rule 2177

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_), x_Symbol] :> Simp[((c + d*x)^(m + 1)*(b*F^(g*(e + f*x)))^n)/(d*(m + 1))
, x] - Dist[(f*g*n*Log[F])/(d*(m + 1)), Int[(c + d*x)^(m + 1)*(b*F^(g*(e +
f*x)))^n, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && LtQ[m, -1] && Int
egerQ[2*m] &&  !$UseGamma === True
```

Rule 2178

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - (c*f)/d))*ExpIntegralEi[(f*g*(c + d*x)*Log[F])/d])/d, x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2269

```
Int[(F_)^((g_.)*((d_.) + (e_.)*(x_))^(n_.))/((a_) + (c_.)*(x_)^2), x_Symbol
] :> Int[ExpandIntegrand[F^(g*(d + e*x)^n), 1/(a + c*x^2), x], x] /; FreeQ[
{F, a, c, d, e, g, n}, x]
```

Rule 2271

```
Int[((F_)^((g_.)*((d_.) + (e_.)*(x_))^(n_.))*(u_)^(m_.))/((a_) + (c_)*(x_)^
2), x_Symbol] :> Int[ExpandIntegrand[F^(g*(d + e*x)^n), u^m/(a + c*x^2), x]
, x] /; FreeQ[{F, a, c, d, e, g, n}, x] && PolynomialQ[u, x] && IntegerQ[m]
```

Rubi steps

$$
\begin{aligned}
\int \frac{e^{a+bx}}{x^2\left(c+dx^2\right)}\,dx &= \int \left(\frac{e^{a+bx}}{cx^2}-\frac{de^{a+bx}}{c\left(c+dx^2\right)}\right)dx \\
&= \frac{\int \frac{e^{a+bx}}{x^2}\,dx}{c}-\frac{d\int \frac{e^{a+bx}}{c+dx^2}\,dx}{c} \\
&= -\frac{e^{a+bx}}{cx}+\frac{b\int \frac{e^{a+bx}}{x}\,dx}{c}-\frac{d\int \left(\frac{\sqrt{-c}\,e^{a+bx}}{2c\left(\sqrt{-c}-\sqrt{d}\,x\right)}+\frac{\sqrt{-c}\,e^{a+bx}}{2c\left(\sqrt{-c}+\sqrt{d}\,x\right)}\right)dx}{c} \\
&= -\frac{e^{a+bx}}{cx}+\frac{be^a\text{Ei}(bx)}{c}-\frac{d\int \frac{e^{a+bx}}{\sqrt{-c}-\sqrt{d}\,x}\,dx}{2(-c)^{3/2}}-\frac{d\int \frac{e^{a+bx}}{\sqrt{-c}+\sqrt{d}\,x}\,dx}{2(-c)^{3/2}} \\
&= -\frac{e^{a+bx}}{cx}+\frac{be^a\text{Ei}(bx)}{c}+\frac{\sqrt{d}\,e^{a+\frac{b\sqrt{-c}}{\sqrt{d}}}\text{Ei}\left(-\frac{b\left(\sqrt{-c}-\sqrt{d}\,x\right)}{\sqrt{d}}\right)}{2(-c)^{3/2}}-\frac{\sqrt{d}\,e^{a-\frac{b\sqrt{-c}}{\sqrt{d}}}\text{Ei}\left(\frac{b\left(\sqrt{-c}+\sqrt{d}\,x\right)}{\sqrt{d}}\right)}{2(-c)^{3/2}}
\end{aligned}
$$

Mathematica [C] time = 0.29, size = 133, normalized size = 0.92

$$
\frac{e^a\left(i\sqrt{d}\,xe^{\frac{ib\sqrt{c}}{\sqrt{d}}}\text{Ei}\left(b\left(x-\frac{i\sqrt{c}}{\sqrt{d}}\right)\right)-i\sqrt{d}\,xe^{-\frac{ib\sqrt{c}}{\sqrt{d}}}\text{Ei}\left(b\left(x+\frac{i\sqrt{c}}{\sqrt{d}}\right)\right)+2b\sqrt{c}\,x\text{Ei}(bx)-2\sqrt{c}\,e^{bx}\right)}{2c^{3/2}x}
$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a + b*x)/(x^2*(c + d*x^2)),x]
```

```
[Out] (E^a*(-2*Sqrt[c]*E^(b*x) + 2*b*Sqrt[c]*x*ExpIntegralEi[b*x] + I*Sqrt[d]*E^(
(I*b*Sqrt[c])/Sqrt[d])*x*ExpIntegralEi[b*(((-I)*Sqrt[c])/Sqrt[d] + x)] - (I
*Sqrt[d]*x*ExpIntegralEi[b*((I*Sqrt[c])/Sqrt[d] + x)])/E^((I*b*Sqrt[c])/Sqr
t[d])))/(2*c^(3/2)*x)
```

fricas [A] time = 0.43, size = 128, normalized size = 0.88

$$\frac{2\,b^{2}cx\mathrm{Ei}\left(bx\right)e^{a}+\sqrt{-\frac{b^{2}c}{d}}\,dx\mathrm{Ei}\left(bx-\sqrt{-\frac{b^{2}c}{d}}\right)e^{\left(a+\sqrt{-\frac{b^{2}c}{d}}\right)}-\sqrt{-\frac{b^{2}c}{d}}\,dx\mathrm{Ei}\left(bx+\sqrt{-\frac{b^{2}c}{d}}\right)e^{\left(a-\sqrt{-\frac{b^{2}c}{d}}\right)}-2\,bce^{(bx+a)}}{2\,bc^{2}x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b*x+a)/x^2/(d*x^2+c),x, algorithm="fricas")
```

```
[Out] 1/2*(2*b^2*c*x*Ei(b*x)*e^a + sqrt(-b^2*c/d)*d*x*Ei(b*x - sqrt(-b^2*c/d))*e^
(a + sqrt(-b^2*c/d)) - sqrt(-b^2*c/d)*d*x*Ei(b*x + sqrt(-b^2*c/d))*e^(a - s
qrt(-b^2*c/d)) - 2*b*c*e^(b*x + a))/(b*c^2*x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{(bx+a)}}{\left(dx^{2}+c\right)x^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b*x+a)/x^2/(d*x^2+c),x, algorithm="giac")
```

```
[Out] integrate(e^(b*x + a)/((d*x^2 + c)*x^2), x)
```

maple [A] time = 0.04, size = 142, normalized size = 0.98

$$\left(-\frac{\mathrm{Ei}\left(1,-bx\right)\mathrm{e}^{a}}{c}+\frac{\left(\mathrm{Ei}\left(1,\frac{ad+\sqrt{-cd}\,b-(bx+a)d}{d}\right)\mathrm{e}^{\frac{ad+\sqrt{-cd}\,b}{d}}-\mathrm{Ei}\left(1,-\frac{-ad+\sqrt{-cd}\,b+(bx+a)d}{d}\right)\mathrm{e}^{-\frac{-ad+\sqrt{-cd}\,b}{d}}\right)d}{2\sqrt{-cd}\,bc}-\frac{\mathrm{e}^{bx+a}}{bcx}\right)b$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(b*x+a)/x^2/(d*x^2+c),x)
```

```
[Out] b*(-exp(b*x+a)/c/b/x+1/2*d*(exp((b*(-c*d)^(1/2)+a*d)/d)*Ei(1,(b*(-c*d)^(1/2
)-(b*x+a)*d+a*d)/d)-exp(-(b*(-c*d)^(1/2)-a*d)/d)*Ei(1,-(b*(-c*d)^(1/2)+(b*x
+a)*d-a*d)/d))/c/b/(-c*d)^(1/2)-1/c*exp(a)*Ei(1,-b*x))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{(bx+a)}}{\left(dx^{2}+c\right)x^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b*x+a)/x^2/(d*x^2+c),x, algorithm="maxima")
```

```
[Out] integrate(e^(b*x + a)/((d*x^2 + c)*x^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{e^{a+b\,x}}{x^2\,\left(d\,x^2+c\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(a + b*x)/(x^2*(c + d*x^2)),x)
```

```
[Out] int(exp(a + b*x)/(x^2*(c + d*x^2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$e^{a} \int \frac{e^{bx}}{cx^{2} + dx^{4}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b*x+a)/x**2/(d*x**2+c),x)
```

```
[Out] exp(a)*Integral(exp(b*x)/(c*x**2 + d*x**4), x)
```

3.463 $\int \frac{e^{a+bx}}{x(c+dx^2)}\,dx$

Optimal. Leaf size=111

$$-\frac{e^{a+\frac{b\sqrt{-c}}{\sqrt{d}}}\text{Ei}\left(-\frac{b\left(\sqrt{-c}-\sqrt{d}\,x\right)}{\sqrt{d}}\right)}{2c}-\frac{e^{a-\frac{b\sqrt{-c}}{\sqrt{d}}}\text{Ei}\left(\frac{b\left(\sqrt{d}\,x+\sqrt{-c}\right)}{\sqrt{d}}\right)}{2c}+\frac{e^a\text{Ei}(bx)}{c}$$

```
[Out] exp(a)*Ei(b*x)/c-1/2*exp(a+b*(-c)^(1/2)/d^(1/2))*Ei(-b*((-c)^(1/2)-x*d^(1/2
))/d^(1/2))/c-1/2*exp(a-b*(-c)^(1/2)/d^(1/2))*Ei(b*((-c)^(1/2)+x*d^(1/2))/d
^(1/2))/c
```

Rubi [A] time = 0.25, antiderivative size = 111, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 2, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {2271, 2178}

$$-\frac{e^{a+\frac{b\sqrt{-c}}{\sqrt{d}}}\text{Ei}\left(-\frac{b\left(\sqrt{-c}-\sqrt{d}\,x\right)}{\sqrt{d}}\right)}{2c}-\frac{e^{a-\frac{b\sqrt{-c}}{\sqrt{d}}}\text{Ei}\left(\frac{b\left(\sqrt{d}\,x+\sqrt{-c}\right)}{\sqrt{d}}\right)}{2c}+\frac{e^a\text{Ei}(bx)}{c}$$

Antiderivative was successfully verified.

```
[In] Int[E^(a + b*x)/(x*(c + d*x^2)),x]
```

```
[Out] (E^a*ExpIntegralEi[b*x])/c - (E^(a + (b*Sqrt[-c])/Sqrt[d])*ExpIntegralEi[-(
(b*(Sqrt[-c] - Sqrt[d]*x))/Sqrt[d])])/(2*c) - (E^(a - (b*Sqrt[-c])/Sqrt[d])
*ExpIntegralEi[(b*(Sqrt[-c] + Sqrt[d]*x))/Sqrt[d]])/(2*c)
```

Rule 2178

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - (c*f)/d))*ExpIntegralEi[(f*g*(c + d*x)*Log[F])/d])/d, x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2271

```
Int[((F_)^((g_.)*((d_.) + (e_.)*(x_))^(n_.))*(u_)^(m_.))/((a_) + (c_)*(x_)^
2), x_Symbol] :> Int[ExpandIntegrand[F^(g*(d + e*x)^n), u^m/(a + c*x^2), x]
, x] /; FreeQ[{F, a, c, d, e, g, n}, x] && PolynomialQ[u, x] && IntegerQ[m]
```

Rubi steps

$$\int \frac{e^{a+bx}}{x\left(c+dx^2\right)}\,dx = \int \left(\frac{e^{a+bx}}{cx} - \frac{de^{a+bx}x}{c\left(c+dx^2\right)}\right)dx$$
$$= \frac{\int \frac{e^{a+bx}}{x}\,dx}{c} - \frac{d\int \frac{e^{a+bx}x}{c+dx^2}\,dx}{c}$$
$$= \frac{e^a\text{Ei}(bx)}{c} - \frac{d\int \left(-\frac{e^{a+bx}}{2\sqrt{d}\left(\sqrt{-c}-\sqrt{d}\,x\right)} + \frac{e^{a+bx}}{2\sqrt{d}\left(\sqrt{-c}+\sqrt{d}\,x\right)}\right)dx}{c}$$
$$= \frac{e^a\text{Ei}(bx)}{c} + \frac{\sqrt{d}\int \frac{e^{a+bx}}{\sqrt{-c}-\sqrt{d}\,x}\,dx}{2c} - \frac{\sqrt{d}\int \frac{e^{a+bx}}{\sqrt{-c}+\sqrt{d}\,x}\,dx}{2c}$$
$$= \frac{e^a\text{Ei}(bx)}{c} - \frac{e^{a+\frac{b\sqrt{-c}}{\sqrt{d}}}\text{Ei}\left(-\frac{b\left(\sqrt{-c}-\sqrt{d}\,x\right)}{\sqrt{d}}\right)}{2c} - \frac{e^{a-\frac{b\sqrt{-c}}{\sqrt{d}}}\text{Ei}\left(\frac{b\left(\sqrt{-c}+\sqrt{d}\,x\right)}{\sqrt{d}}\right)}{2c}$$

Mathematica [C] time = 0.13, size = 93, normalized size = 0.84

$$\frac{e^a\left(2\text{Ei}(bx) - e^{-\frac{ib\sqrt{c}}{\sqrt{d}}}\left(e^{\frac{2ib\sqrt{c}}{\sqrt{d}}}\text{Ei}\left(b\left(x-\frac{i\sqrt{c}}{\sqrt{d}}\right)\right) + \text{Ei}\left(b\left(x+\frac{i\sqrt{c}}{\sqrt{d}}\right)\right)\right)\right)}{2c}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a + b*x)/(x*(c + d*x^2)),x]
```

```
[Out] (E^a*(2*ExpIntegralEi[b*x] - (E^(((2*I)*b*Sqrt[c])/Sqrt[d])*ExpIntegralEi[b
*(((-I)*Sqrt[c])/Sqrt[d] + x)] + ExpIntegralEi[b*((I*Sqrt[c])/Sqrt[d] + x)]
)/E^((I*b*Sqrt[c])/Sqrt[d])))/(2*c)
```

fricas [A] time = 0.42, size = 80, normalized size = 0.72

$$-\frac{\text{Ei}\left(bx-\sqrt{-\frac{b^2c}{d}}\right)e^{\left(a+\sqrt{-\frac{b^2c}{d}}\right)} + \text{Ei}\left(bx+\sqrt{-\frac{b^2c}{d}}\right)e^{\left(a-\sqrt{-\frac{b^2c}{d}}\right)} - 2\,\text{Ei}\,(bx)\,e^a}{2\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b*x+a)/x/(d*x^2+c),x, algorithm="fricas")
```

```
[Out] -1/2*(Ei(b*x - sqrt(-b^2*c/d))*e^(a + sqrt(-b^2*c/d)) + Ei(b*x + sqrt(-b^2*
c/d))*e^(a - sqrt(-b^2*c/d)) - 2*Ei(b*x)*e^a)/c
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{(bx+a)}}{(dx^2+c)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b*x+a)/x/(d*x^2+c),x, algorithm="giac")
```

```
[Out] integrate(e^(b*x + a)/((d*x^2 + c)*x), x)
```

maple [A] time = 0.03, size = 112, normalized size = 1.01

$$-\frac{\mathrm{Ei}(1,-bx)\,\mathrm{e}^{a}}{c}+\frac{\mathrm{Ei}\left(1,\frac{ad+\sqrt{-cd}\,b-(bx+a)d}{d}\right)\mathrm{e}^{\frac{ad+\sqrt{-cd}\,b}{d}}+\mathrm{Ei}\left(1,-\frac{-ad+\sqrt{-cd}\,b+(bx+a)d}{d}\right)\mathrm{e}^{-\frac{-ad+\sqrt{-cd}\,b}{d}}}{2c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(b*x+a)/x/(d*x^2+c),x)
```

```
[Out] 1/2*(exp((a*d+(-c*d)^(1/2)*b)/d)*Ei(1,(a*d+(-c*d)^(1/2)*b-(b*x+a)*d)/d)+exp
(-(-a*d+(-c*d)^(1/2)*b)/d)*Ei(1,-(-a*d+(-c*d)^(1/2)*b+(b*x+a)*d)/d))/c-1/c*
exp(a)*Ei(1,-b*x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{(bx+a)}}{(dx^2+c)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b*x+a)/x/(d*x^2+c),x, algorithm="maxima")
```

```
[Out] integrate(e^(b*x + a)/((d*x^2 + c)*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{e}^{a+b\,x}}{x\,\left(d\,x^2+c\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(a + b*x)/(x*(c + d*x^2)),x)
```

```
[Out] int(exp(a + b*x)/(x*(c + d*x^2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$e^{a}\int \frac{e^{bx}}{cx + dx^{3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b*x+a)/x/(d*x**2+c),x)
```

```
[Out] exp(a)*Integral(exp(b*x)/(c*x + d*x**3), x)
```

3.464 $\int \frac{e^{a+bx}}{c+dx^2}\,dx$

Optimal. Leaf size=118

$$\frac{e^{a+\frac{b\sqrt{-c}}{\sqrt{d}}}\text{Ei}\left(-\frac{b\left(\sqrt{-c}-\sqrt{d}\,x\right)}{\sqrt{d}}\right)}{2\sqrt{-c}\,\sqrt{d}}-\frac{e^{a-\frac{b\sqrt{-c}}{\sqrt{d}}}\text{Ei}\left(\frac{b\left(\sqrt{d}\,x+\sqrt{-c}\right)}{\sqrt{d}}\right)}{2\sqrt{-c}\,\sqrt{d}}$$

```
[Out] 1/2*exp(a+b*(-c)^(1/2)/d^(1/2))*Ei(-b*((-c)^(1/2)-x*d^(1/2))/d^(1/2))/(-c)^
(1/2)/d^(1/2)-1/2*exp(a-b*(-c)^(1/2)/d^(1/2))*Ei(b*((-c)^(1/2)+x*d^(1/2))/d
^(1/2))/(-c)^(1/2)/d^(1/2)
```

Rubi [A] time = 0.12, antiderivative size = 118, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118, Rules used = {2269, 2178}

$$\frac{e^{a+\frac{b\sqrt{-c}}{\sqrt{d}}}\text{Ei}\left(-\frac{b\left(\sqrt{-c}-\sqrt{d}\,x\right)}{\sqrt{d}}\right)}{2\sqrt{-c}\,\sqrt{d}}-\frac{e^{a-\frac{b\sqrt{-c}}{\sqrt{d}}}\text{Ei}\left(\frac{b\left(\sqrt{d}\,x+\sqrt{-c}\right)}{\sqrt{d}}\right)}{2\sqrt{-c}\,\sqrt{d}}$$

Antiderivative was successfully verified.

```
[In] Int[E^(a + b*x)/(c + d*x^2),x]
```

```
[Out] (E^(a + (b*Sqrt[-c])/Sqrt[d])*ExpIntegralEi[-((b*(Sqrt[-c] - Sqrt[d]*x))/Sq
rt[d])])/(2*Sqrt[-c]*Sqrt[d]) - (E^(a - (b*Sqrt[-c])/Sqrt[d])*ExpIntegralEi
[(b*(Sqrt[-c] + Sqrt[d]*x))/Sqrt[d]])/(2*Sqrt[-c]*Sqrt[d])
```

Rule 2178

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - (c*f)/d))*ExpIntegralEi[(f*g*(c + d*x)*Log[F])/d])/d, x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2269

```
Int[(F_)^((g_.)*((d_.) + (e_.)*(x_))^(n_.))/((a_) + (c_.)*(x_)^2), x_Symbol
] :> Int[ExpandIntegrand[F^(g*(d + e*x)^n), 1/(a + c*x^2), x], x] /; FreeQ[
{F, a, c, d, e, g, n}, x]
```

Rubi steps

$$\int \frac{e^{a+bx}}{c+dx^2}\,dx = \int \left(\frac{\sqrt{-c}\,e^{a+bx}}{2c\left(\sqrt{-c}\,-\sqrt{d}\,x\right)}+\frac{\sqrt{-c}\,e^{a+bx}}{2c\left(\sqrt{-c}\,+\sqrt{d}\,x\right)}\right)dx$$
$$= -\frac{\int \frac{e^{a+bx}}{\sqrt{-c}-\sqrt{d}\,x}\,dx}{2\sqrt{-c}} - \frac{\int \frac{e^{a+bx}}{\sqrt{-c}+\sqrt{d}\,x}\,dx}{2\sqrt{-c}}$$
$$= \frac{e^{a+\frac{b\sqrt{-c}}{\sqrt{d}}}\,\text{Ei}\left(-\frac{b\left(\sqrt{-c}-\sqrt{d}\,x\right)}{\sqrt{d}}\right)}{2\sqrt{-c}\,\sqrt{d}} - \frac{e^{a-\frac{b\sqrt{-c}}{\sqrt{d}}}\,\text{Ei}\left(\frac{b\left(\sqrt{-c}+\sqrt{d}\,x\right)}{\sqrt{d}}\right)}{2\sqrt{-c}\,\sqrt{d}}$$

Mathematica [C] time = 0.06, size = 94, normalized size = 0.80

$$-\frac{ie^{a-\frac{ib\sqrt{c}}{\sqrt{d}}}\left(e^{\frac{2ib\sqrt{c}}{\sqrt{d}}}\,\text{Ei}\left(b\left(x-\frac{i\sqrt{c}}{\sqrt{d}}\right)\right)-\text{Ei}\left(b\left(x+\frac{i\sqrt{c}}{\sqrt{d}}\right)\right)\right)}{2\sqrt{c}\,\sqrt{d}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a + b*x)/(c + d*x^2),x]
```

```
[Out] ((-1/2*I)*E^(a - (I*b*Sqrt[c])/Sqrt[d])*(E^(((2*I)*b*Sqrt[c])/Sqrt[d])*ExpI
ntegralEi[b*(((-I)*Sqrt[c])/Sqrt[d] + x)] - ExpIntegralEi[b*((I*Sqrt[c])/Sq
rt[d] + x)]))/(Sqrt[c]*Sqrt[d])
```

fricas [A] time = 0.39, size = 98, normalized size = 0.83

$$-\frac{\sqrt{-\frac{b^2c}{d}}\,\text{Ei}\left(bx-\sqrt{-\frac{b^2c}{d}}\right)e^{\left(a+\sqrt{-\frac{b^2c}{d}}\right)}-\sqrt{-\frac{b^2c}{d}}\,\text{Ei}\left(bx+\sqrt{-\frac{b^2c}{d}}\right)e^{\left(a-\sqrt{-\frac{b^2c}{d}}\right)}}{2\,bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b*x+a)/(d*x^2+c),x, algorithm="fricas")
```

```
[Out] -1/2*(sqrt(-b^2*c/d)*Ei(b*x - sqrt(-b^2*c/d))*e^(a + sqrt(-b^2*c/d)) - sqrt
(-b^2*c/d)*Ei(b*x + sqrt(-b^2*c/d))*e^(a - sqrt(-b^2*c/d)))/(b*c)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{(bx+a)}}{dx^2+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b*x+a)/(d*x^2+c),x, algorithm="giac")
```

```
[Out] integrate(e^(b*x + a)/(d*x^2 + c), x)
```

maple [A] time = 0.02, size = 102, normalized size = 0.86

$$-\frac{\mathrm{Ei}\left(1, \frac{ad+\sqrt{-cd}\,b-(bx+a)d}{d}\right) \mathrm{e}^{\frac{ad+\sqrt{-cd}\,b}{d}} - \mathrm{Ei}\left(1, -\frac{-ad+\sqrt{-cd}\,b+(bx+a)d}{d}\right) \mathrm{e}^{-\frac{-ad+\sqrt{-cd}\,b}{d}}}{2\sqrt{-cd}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(b*x+a)/(d*x^2+c),x)
```

```
[Out] -1/2*(exp((a*d+(-c*d)^(1/2)*b)/d)*Ei(1,(a*d+(-c*d)^(1/2)*b-(b*x+a)*d)/d)-ex
p(-(-a*d+(-c*d)^(1/2)*b)/d)*Ei(1,-(-a*d+(-c*d)^(1/2)*b+(b*x+a)*d)/d))/(-c*d
)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{(bx+a)}}{dx^2 + c}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b*x+a)/(d*x^2+c),x, algorithm="maxima")
```

```
[Out] integrate(e^(b*x + a)/(d*x^2 + c), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{e}^{a+b\,x}}{d\,x^2 + c}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(a + b*x)/(c + d*x^2),x)
```

```
[Out] int(exp(a + b*x)/(c + d*x^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$e^{a} \int \frac{e^{bx}}{c + dx^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b*x+a)/(d*x**2+c),x)
```

```
[Out] exp(a)*Integral(exp(b*x)/(c + d*x**2), x)
```

3.465 $\int \frac{e^{a+bx}x}{c+dx^2}\,dx$

Optimal. Leaf size=100

$$\frac{e^{a+\frac{b\sqrt{-c}}{\sqrt{d}}}\operatorname{Ei}\left(-\frac{b\left(\sqrt{-c}-\sqrt{d}\,x\right)}{\sqrt{d}}\right)}{2d}+\frac{e^{a-\frac{b\sqrt{-c}}{\sqrt{d}}}\operatorname{Ei}\left(\frac{b\left(\sqrt{d}\,x+\sqrt{-c}\right)}{\sqrt{d}}\right)}{2d}$$

```
[Out] 1/2*exp(a+b*(-c)^(1/2)/d^(1/2))*Ei(-b*((-c)^(1/2)-x*d^(1/2))/d^(1/2))/d+1/2
*exp(a-b*(-c)^(1/2)/d^(1/2))*Ei(b*((-c)^(1/2)+x*d^(1/2))/d^(1/2))/d
```

Rubi [A] time = 0.13, antiderivative size = 100, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2271, 2178}

$$\frac{e^{a+\frac{b\sqrt{-c}}{\sqrt{d}}}\operatorname{Ei}\left(-\frac{b\left(\sqrt{-c}-\sqrt{d}\,x\right)}{\sqrt{d}}\right)}{2d}+\frac{e^{a-\frac{b\sqrt{-c}}{\sqrt{d}}}\operatorname{Ei}\left(\frac{b\left(\sqrt{d}\,x+\sqrt{-c}\right)}{\sqrt{d}}\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[(E^(a + b*x)*x)/(c + d*x^2),x]
```

```
[Out] (E^(a + (b*Sqrt[-c])/Sqrt[d])*ExpIntegralEi[-((b*(Sqrt[-c] - Sqrt[d]*x))/Sq
rt[d])])/(2*d) + (E^(a - (b*Sqrt[-c])/Sqrt[d])*ExpIntegralEi[(b*(Sqrt[-c] +
 Sqrt[d]*x))/Sqrt[d]])/(2*d)
```

Rule 2178

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - (c*f)/d))*ExpIntegralEi[(f*g*(c + d*x)*Log[F])/d])/d, x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2271

```
Int[((F_)^((g_.)*((d_.) + (e_.)*(x_))^(n_.))*(u_)^(m_.))/((a_) + (c_)*(x_)^
2), x_Symbol] :> Int[ExpandIntegrand[F^(g*(d + e*x)^n), u^m/(a + c*x^2), x]
, x] /; FreeQ[{F, a, c, d, e, g, n}, x] && PolynomialQ[u, x] && IntegerQ[m]
```

Rubi steps

$$\int \frac{e^{a+bx}x}{c+dx^2}\,dx = \int \left(-\frac{e^{a+bx}}{2\sqrt{d}\left(\sqrt{-c}-\sqrt{d}\,x\right)}+\frac{e^{a+bx}}{2\sqrt{d}\left(\sqrt{-c}+\sqrt{d}\,x\right)}\right)dx$$
$$= -\frac{\int \frac{e^{a+bx}}{\sqrt{-c}-\sqrt{d}\,x}\,dx}{2\sqrt{d}}+\frac{\int \frac{e^{a+bx}}{\sqrt{-c}+\sqrt{d}\,x}\,dx}{2\sqrt{d}}$$
$$= \frac{e^{a+\frac{b\sqrt{-c}}{\sqrt{d}}}\text{Ei}\left(-\frac{b\left(\sqrt{-c}-\sqrt{d}\,x\right)}{\sqrt{d}}\right)}{2d}+\frac{e^{a-\frac{b\sqrt{-c}}{\sqrt{d}}}\text{Ei}\left(\frac{b\left(\sqrt{-c}+\sqrt{d}\,x\right)}{\sqrt{d}}\right)}{2d}$$

Mathematica [C] time = 0.06, size = 83, normalized size = 0.83

$$\frac{e^{a-\frac{ib\sqrt{c}}{\sqrt{d}}}\left(e^{\frac{2ib\sqrt{c}}{\sqrt{d}}}\text{Ei}\left(b\left(x-\frac{i\sqrt{c}}{\sqrt{d}}\right)\right)+\text{Ei}\left(b\left(x+\frac{i\sqrt{c}}{\sqrt{d}}\right)\right)\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^(a + b*x)*x)/(c + d*x^2),x]
```

```
[Out] (E^(a - (I*b*Sqrt[c])/Sqrt[d])*(E^(((2*I)*b*Sqrt[c])/Sqrt[d])*ExpIntegralEi
[b*(((-I)*Sqrt[c])/Sqrt[d] + x)] + ExpIntegralEi[b*((I*Sqrt[c])/Sqrt[d] + x
)]))/(2*d)
```

fricas [A] time = 0.40, size = 72, normalized size = 0.72

$$\frac{\text{Ei}\left(bx-\sqrt{-\frac{b^2c}{d}}\right)e^{\left(a+\sqrt{-\frac{b^2c}{d}}\right)}+\text{Ei}\left(bx+\sqrt{-\frac{b^2c}{d}}\right)e^{\left(a-\sqrt{-\frac{b^2c}{d}}\right)}}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b*x+a)*x/(d*x^2+c),x, algorithm="fricas")
```

```
[Out] 1/2*(Ei(b*x - sqrt(-b^2*c/d))*e^(a + sqrt(-b^2*c/d)) + Ei(b*x + sqrt(-b^2*c
/d))*e^(a - sqrt(-b^2*c/d)))/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{xe^{(bx+a)}}{dx^2+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b*x+a)*x/(d*x^2+c),x, algorithm="giac")
```

```
[Out] integrate(x*e^(b*x + a)/(d*x^2 + c), x)
```

maple [B] time = 0.03, size = 323, normalized size = 3.23

$$\frac{\frac{\left(\mathrm{Ei}\left(1,\frac{ad+\sqrt{-cd}\,b-(bx+a)d}{d}\right)\mathrm{e}^{\frac{ad+\sqrt{-cd}\,b}{d}}-\mathrm{Ei}\left(1,-\frac{-ad+\sqrt{-cd}\,b+(bx+a)d}{d}\right)\mathrm{e}^{-\frac{-ad+\sqrt{-cd}\,b}{d}}\right)ab}{2\sqrt{-cd}}-\frac{\left(ad\,\mathrm{Ei}\left(1,\frac{ad+\sqrt{-cd}\,b-(bx+a)d}{d}\right)\mathrm{e}^{\frac{ad+\sqrt{-cd}\,b}{d}}-ad\,\mathrm{Ei}\left(1,-\frac{-ad+\sqrt{-cd}\,b+}{d}\right.\right.}{}}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(b*x+a)*x/(d*x^2+c),x)
```

```
[Out] 1/b^2*(-1/2*b/d*(exp((a*d+(-c*d)^(1/2)*b)/d)*Ei(1,(a*d+(-c*d)^(1/2)*b-(b*x+
a)*d)/d)*(-c*d)^(1/2)*b+exp((a*d+(-c*d)^(1/2)*b)/d)*Ei(1,(a*d+(-c*d)^(1/2)*
b-(b*x+a)*d)/d)*a*d+exp(-(-a*d+(-c*d)^(1/2)*b)/d)*Ei(1,-(-a*d+(-c*d)^(1/2)*
b+(b*x+a)*d)/d)*(-c*d)^(1/2)*b-exp(-(-a*d+(-c*d)^(1/2)*b)/d)*Ei(1,-(-a*d+(-
c*d)^(1/2)*b+(b*x+a)*d)/d)*a*d)/(-c*d)^(1/2)+1/2*a*b*(exp((a*d+(-c*d)^(1/2)
*b)/d)*Ei(1,(a*d+(-c*d)^(1/2)*b-(b*x+a)*d)/d)-exp(-(-a*d+(-c*d)^(1/2)*b)/d)
*Ei(1,-(-a*d+(-c*d)^(1/2)*b+(b*x+a)*d)/d))/(-c*d)^(1/2))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{xe^{(bx+a)}}{bdx^2+bc}+\int\frac{\left(dx^2e^a-ce^a\right)e^{(bx)}}{bd^2x^4+2\,bcdx^2+bc^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b*x+a)*x/(d*x^2+c),x, algorithm="maxima")
```

```
[Out] x*e^(b*x + a)/(b*d*x^2 + b*c) + integrate((d*x^2*e^a - c*e^a)*e^(b*x)/(b*d^
2*x^4 + 2*b*c*d*x^2 + b*c^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{x\,\mathrm{e}^{a+b\,x}}{d\,x^2+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*exp(a + b*x))/(c + d*x^2),x)
```

```
[Out] int((x*exp(a + b*x))/(c + d*x^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$e^a \int \frac{xe^{bx}}{c + dx^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b*x+a)*x/(d*x**2+c),x)
```

```
[Out] exp(a)*Integral(x*exp(b*x)/(c + d*x**2), x)
```

3.466 $\int \frac{e^{a+bx}x^2}{c+dx^2}\,dx$

Optimal. Leaf size=132

$$\frac{\sqrt{-c}\,e^{a+\frac{b\sqrt{-c}}{\sqrt{d}}}\operatorname{Ei}\left(-\frac{b\left(\sqrt{-c}-\sqrt{d}\,x\right)}{\sqrt{d}}\right)}{2d^{3/2}}-\frac{\sqrt{-c}\,e^{a-\frac{b\sqrt{-c}}{\sqrt{d}}}\operatorname{Ei}\left(\frac{b\left(\sqrt{d}\,x+\sqrt{-c}\right)}{\sqrt{d}}\right)}{2d^{3/2}}+\frac{e^{a+bx}}{bd}$$

```
[Out] exp(b*x+a)/b/d+1/2*exp(a+b*(-c)^(1/2)/d^(1/2))*Ei(-b*((-c)^(1/2)-x*d^(1/2))
/d^(1/2))*(-c)^(1/2)/d^(3/2)-1/2*exp(a-b*(-c)^(1/2)/d^(1/2))*Ei(b*((-c)^(1/
2)+x*d^(1/2))/d^(1/2))*(-c)^(1/2)/d^(3/2)
```

Rubi [A] time = 0.24, antiderivative size = 132, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 4, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2271, 2194, 2269, 2178}

$$\frac{\sqrt{-c}\,e^{a+\frac{b\sqrt{-c}}{\sqrt{d}}}\operatorname{Ei}\left(-\frac{b\left(\sqrt{-c}-\sqrt{d}\,x\right)}{\sqrt{d}}\right)}{2d^{3/2}}-\frac{\sqrt{-c}\,e^{a-\frac{b\sqrt{-c}}{\sqrt{d}}}\operatorname{Ei}\left(\frac{b\left(\sqrt{d}\,x+\sqrt{-c}\right)}{\sqrt{d}}\right)}{2d^{3/2}}+\frac{e^{a+bx}}{bd}$$

Antiderivative was successfully verified.

```
[In] Int[(E^(a + b*x)*x^2)/(c + d*x^2),x]
```

```
[Out] E^(a + b*x)/(b*d) + (Sqrt[-c]*E^(a + (b*Sqrt[-c])/Sqrt[d])*ExpIntegralEi[-(
(b*(Sqrt[-c] - Sqrt[d]*x))/Sqrt[d])])/(2*d^(3/2)) - (Sqrt[-c]*E^(a - (b*Sqr
t[-c])/Sqrt[d])*ExpIntegralEi[(b*(Sqrt[-c] + Sqrt[d]*x))/Sqrt[d]])/(2*d^(3/
2))
```

Rule 2178

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - (c*f)/d))*ExpIntegralEi[(f*g*(c + d*x)*Log[F])/d])/d, x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2194

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 2269

```
Int[(F_)^((g_.)*((d_.) + (e_.)*(x_))^(n_.))/((a_) + (c_.)*(x_)^2), x_Symbol
] :> Int[ExpandIntegrand[F^(g*(d + e*x)^n), 1/(a + c*x^2), x], x] /; FreeQ[
```

```
{F, a, c, d, e, g, n}, x]
```

Rule 2271

```
Int[((F_)^((g_.)*((d_.) + (e_.)*(x_))^(n_.))*(u_)^(m_.))/((a_) + (c_)*(x_)^
2), x_Symbol] :> Int[ExpandIntegrand[F^(g*(d + e*x)^n), u^m/(a + c*x^2), x]
, x] /; FreeQ[{F, a, c, d, e, g, n}, x] && PolynomialQ[u, x] && IntegerQ[m]
```

Rubi steps

$$\begin{aligned}
\int \frac{e^{a+bx}x^2}{c+dx^2}\,dx &= \int \left(\frac{e^{a+bx}}{d}-\frac{ce^{a+bx}}{d\left(c+dx^2\right)}\right)dx\\
&= \frac{\int e^{a+bx}\,dx}{d}-\frac{c\int \frac{e^{a+bx}}{c+dx^2}\,dx}{d}\\
&= \frac{e^{a+bx}}{bd}-\frac{c\int \left(\frac{\sqrt{-c}\,e^{a+bx}}{2c\left(\sqrt{-c}-\sqrt{d}\,x\right)}+\frac{\sqrt{-c}\,e^{a+bx}}{2c\left(\sqrt{-c}+\sqrt{d}\,x\right)}\right)dx}{d}\\
&= \frac{e^{a+bx}}{bd}-\frac{\sqrt{-c}\int \frac{e^{a+bx}}{\sqrt{-c}-\sqrt{d}\,x}\,dx}{2d}-\frac{\sqrt{-c}\int \frac{e^{a+bx}}{\sqrt{-c}+\sqrt{d}\,x}\,dx}{2d}\\
&= \frac{e^{a+bx}}{bd}+\frac{\sqrt{-c}\,e^{a+\frac{b\sqrt{-c}}{\sqrt{d}}}\,\mathrm{Ei}\left(-\frac{b\left(\sqrt{-c}-\sqrt{d}\,x\right)}{\sqrt{d}}\right)}{2d^{3/2}}-\frac{\sqrt{-c}\,e^{a-\frac{b\sqrt{-c}}{\sqrt{d}}}\,\mathrm{Ei}\left(\frac{b\left(\sqrt{-c}+\sqrt{d}\,x\right)}{\sqrt{d}}\right)}{2d^{3/2}}
\end{aligned}$$

Mathematica [C] time = 0.13, size = 120, normalized size = 0.91

$$\frac{e^a\left(ib\sqrt{c}\,e^{\frac{ib\sqrt{c}}{\sqrt{d}}}\,\mathrm{Ei}\left(b\left(x-\frac{i\sqrt{c}}{\sqrt{d}}\right)\right)-ib\sqrt{c}\,e^{-\frac{ib\sqrt{c}}{\sqrt{d}}}\,\mathrm{Ei}\left(b\left(x+\frac{i\sqrt{c}}{\sqrt{d}}\right)\right)+2\sqrt{d}\,e^{bx}\right)}{2bd^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^(a + b*x)*x^2)/(c + d*x^2),x]
```

```
[Out] (E^a*(2*Sqrt[d]*E^(b*x) + I*b*Sqrt[c]*E^((I*b*Sqrt[c])/Sqrt[d])*ExpIntegral
Ei[b*(((-I)*Sqrt[c])/Sqrt[d] + x)] - (I*b*Sqrt[c]*ExpIntegralEi[b*((I*Sqrt[
c])/Sqrt[d] + x)])/E^((I*b*Sqrt[c])/Sqrt[d])))/(2*b*d^(3/2))
```

fricas [A] time = 0.41, size = 106, normalized size = 0.80

$$\frac{\sqrt{-\frac{b^2c}{d}}\,\mathrm{Ei}\left(bx-\sqrt{-\frac{b^2c}{d}}\right)e^{\left(a+\sqrt{-\frac{b^2c}{d}}\right)}-\sqrt{-\frac{b^2c}{d}}\,\mathrm{Ei}\left(bx+\sqrt{-\frac{b^2c}{d}}\right)e^{\left(a-\sqrt{-\frac{b^2c}{d}}\right)}+2\,e^{(bx+a)}}{2\,bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b*x+a)*x^2/(d*x^2+c),x, algorithm="fricas")
```

```
[Out] 1/2*(sqrt(-b^2*c/d)*Ei(b*x - sqrt(-b^2*c/d))*e^(a + sqrt(-b^2*c/d)) - sqrt(
-b^2*c/d)*Ei(b*x + sqrt(-b^2*c/d))*e^(a - sqrt(-b^2*c/d)) + 2*e^(b*x + a))/
(b*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2e^{(bx+a)}}{dx^2+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b*x+a)*x^2/(d*x^2+c),x, algorithm="giac")
```

```
[Out] integrate(x^2*e^(b*x + a)/(d*x^2 + c), x)
```

maple [B] time = 0.04, size = 660, normalized size = 5.00

$$-\frac{\left(\mathrm{Ei}\left(1,\frac{ad+\sqrt{-cd}\;b-(bx+a)d}{d}\right)\mathrm{e}^{\frac{ad+\sqrt{-cd}\;b}{d}}-\mathrm{Ei}\left(1,-\frac{-ad+\sqrt{-cd}\;b+(bx+a)d}{d}\right)\mathrm{e}^{-\frac{-ad+\sqrt{-cd}\;b}{d}}\right)a^2b}{2\sqrt{-cd}}+\frac{b^2\mathrm{e}^{bx+a}}{d}+\frac{\left(ad\,\mathrm{Ei}\left(1,\frac{ad+\sqrt{-cd}\;b-(bx+a)d}{d}\right)\mathrm{e}^{\frac{ad+\sqrt{-cd}\;b}{d}}-ad\,\mathrm{Ei}\left(\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(b*x+a)*x^2/(d*x^2+c),x)
```

```
[Out] 1/b^3*(b^2/d*exp(b*x+a)-1/2/d*b*(2*exp((a*d+(-c*d)^(1/2)*b)/d)*Ei(1,(a*d+(-
c*d)^(1/2)*b-(b*x+a)*d)/d)*(-c*d)^(1/2)*a*b+exp((a*d+(-c*d)^(1/2)*b)/d)*Ei(
1,(a*d+(-c*d)^(1/2)*b-(b*x+a)*d)/d)*a^2*d-exp((a*d+(-c*d)^(1/2)*b)/d)*Ei(1,
(a*d+(-c*d)^(1/2)*b-(b*x+a)*d)/d)*b^2*c+2*exp(-(-a*d+(-c*d)^(1/2)*b)/d)*Ei(
1,-(-a*d+(-c*d)^(1/2)*b+(b*x+a)*d)/d)*(-c*d)^(1/2)*a*b-exp(-(-a*d+(-c*d)^(1
/2)*b)/d)*Ei(1,-(-a*d+(-c*d)^(1/2)*b+(b*x+a)*d)/d)*a^2*d+exp(-(-a*d+(-c*d)^
(1/2)*b)/d)*Ei(1,-(-a*d+(-c*d)^(1/2)*b+(b*x+a)*d)/d)*b^2*c)/(-c*d)^(1/2)-1/
2*a^2*b*(exp((a*d+(-c*d)^(1/2)*b)/d)*Ei(1,(a*d+(-c*d)^(1/2)*b-(b*x+a)*d)/d)
-exp(-(-a*d+(-c*d)^(1/2)*b)/d)*Ei(1,-(-a*d+(-c*d)^(1/2)*b+(b*x+a)*d)/d))/(-
c*d)^(1/2)+a*b/d*(exp((a*d+(-c*d)^(1/2)*b)/d)*Ei(1,(a*d+(-c*d)^(1/2)*b-(b*x
```

```
+a)*d)/d)*(-c*d)^(1/2)*b+exp((a*d+(-c*d)^(1/2)*b)/d)*Ei(1,(a*d+(-c*d)^(1/2)
*b-(b*x+a)*d)/d)*a*d+exp(-(-a*d+(-c*d)^(1/2)*b)/d)*Ei(1,-(-a*d+(-c*d)^(1/2)
*b+(b*x+a)*d)/d)*(-c*d)^(1/2)*b-exp(-(-a*d+(-c*d)^(1/2)*b)/d)*Ei(1,-(-a*d+(
-c*d)^(1/2)*b+(b*x+a)*d)/d)*a*d)/(-c*d)^(1/2))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{x^2e^{(bx+a)}}{bdx^2+bc}-2\,c\int\frac{xe^{(bx+a)}}{bd^2x^4+2\,bcdx^2+bc^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b*x+a)*x^2/(d*x^2+c),x, algorithm="maxima")
```

```
[Out] x^2*e^(b*x + a)/(b*d*x^2 + b*c) - 2*c*integrate(x*e^(b*x + a)/(b*d^2*x^4 +
2*b*c*d*x^2 + b*c^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{x^2\,\mathrm{e}^{a+b\,x}}{d\,x^2+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*exp(a + b*x))/(c + d*x^2),x)
```

```
[Out] int((x^2*exp(a + b*x))/(c + d*x^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$e^a\int\frac{x^2e^{bx}}{c+dx^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(b*x+a)*x**2/(d*x**2+c),x)
```

```
[Out] exp(a)*Integral(x**2*exp(b*x)/(c + d*x**2), x)
```

3.467 $\int \frac{e^{d+ex}}{x^2(a+bx+cx^2)}\,dx$

Optimal. Leaf size=212

$$\frac{\left(\frac{b^2-2ac}{\sqrt{b^2-4ac}}+b\right)e^{d-\frac{e\left(b-\sqrt{b^2-4ac}\right)}{2c}}\text{Ei}\left(\frac{e\left(b+2cx-\sqrt{b^2-4ac}\right)}{2c}\right)}{2a^2}+\frac{\left(b-\frac{b^2-2ac}{\sqrt{b^2-4ac}}\right)e^{d-\frac{e\left(\sqrt{b^2-4ac}+b\right)}{2c}}\text{Ei}\left(\frac{e\left(b+2cx+\sqrt{b^2-4ac}\right)}{2c}\right)}{2a^2}-\frac{be^d\text{Ei}(ex)}{a^2}+\frac{e^d}{}$$

```
[Out] -exp(e*x+d)/a/x-b*exp(d)*Ei(e*x)/a^2+e*exp(d)*Ei(e*x)/a+1/2*exp(d-1/2*e*(b+
(-4*a*c+b^2)^(1/2))/c)*Ei(1/2*e*(b+2*c*x+(-4*a*c+b^2)^(1/2))/c)*(b+(2*a*c-b
^2)/(-4*a*c+b^2)^(1/2))/a^2+1/2*exp(d-1/2*e*(b-(-4*a*c+b^2)^(1/2))/c)*Ei(1/
2*e*(b+2*c*x-(-4*a*c+b^2)^(1/2))/c)*(b+(-2*a*c+b^2)/(-4*a*c+b^2)^(1/2))/a^2
```

Rubi [A] time = 0.62, antiderivative size = 212, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used = {2270, 2177, 2178}

$$\frac{\left(\frac{b^2-2ac}{\sqrt{b^2-4ac}}+b\right)e^{d-\frac{e\left(b-\sqrt{b^2-4ac}\right)}{2c}}\text{Ei}\left(\frac{e\left(b+2cx-\sqrt{b^2-4ac}\right)}{2c}\right)}{2a^2}+\frac{\left(b-\frac{b^2-2ac}{\sqrt{b^2-4ac}}\right)e^{d-\frac{e\left(\sqrt{b^2-4ac}+b\right)}{2c}}\text{Ei}\left(\frac{e\left(b+2cx+\sqrt{b^2-4ac}\right)}{2c}\right)}{2a^2}-\frac{be^d\text{Ei}(ex)}{a^2}+\frac{e^d}{}$$

Antiderivative was successfully verified.

```
[In] Int[E^(d + e*x)/(x^2*(a + b*x + c*x^2)),x]
```

```
[Out] -(E^(d + e*x)/(a*x)) - (b*E^d*ExpIntegralEi[e*x])/a^2 + (e*E^d*ExpIntegralE
i[e*x])/a + ((b + (b^2 - 2*a*c)/Sqrt[b^2 - 4*a*c])*E^(d - ((b - Sqrt[b^2 -
4*a*c])*e)/(2*c))*ExpIntegralEi[(e*(b - Sqrt[b^2 - 4*a*c] + 2*c*x))/(2*c)])
/(2*a^2) + ((b - (b^2 - 2*a*c)/Sqrt[b^2 - 4*a*c])*E^(d - ((b + Sqrt[b^2 - 4
*a*c])*e)/(2*c))*ExpIntegralEi[(e*(b + Sqrt[b^2 - 4*a*c] + 2*c*x))/(2*c)])/
(2*a^2)
```

Rule 2177

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_), x_Symbol] :> Simp[((c + d*x)^(m + 1)*(b*F^(g*(e + f*x)))^n)/(d*(m + 1))
, x] - Dist[(f*g*n*Log[F])/(d*(m + 1)), Int[(c + d*x)^(m + 1)*(b*F^(g*(e +
f*x)))^n, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && LtQ[m, -1] && Int
egerQ[2*m] &&  !$UseGamma === True
```

Rule 2178

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - (c*f)/d))*ExpIntegralEi[(f*g*(c + d*x)*Log[F])/d])/d, x] /; F
```

```
reeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2270

```
Int[((F_)^((g_.)*((d_.) + (e_.)*(x_))^(n_.))*(u_)^(m_.))/((a_.) + (b_.)*(x_
) + (c_)*(x_)^2), x_Symbol] :> Int[ExpandIntegrand[F^(g*(d + e*x)^n), u^m/(
a + b*x + c*x^2), x], x] /; FreeQ[{F, a, b, c, d, e, g, n}, x] && Polynomia
lQ[u, x] && IntegerQ[m]
```

Rubi steps

$$\int \frac{e^{d+ex}}{x^2\left(a+bx+cx^2\right)}\,dx = \int \left(\frac{e^{d+ex}}{ax^2}-\frac{be^{d+ex}}{a^2x}+\frac{e^{d+ex}\left(b^2-ac+bcx\right)}{a^2\left(a+bx+cx^2\right)}\right)dx$$

$$= \frac{\int \frac{e^{d+ex}\left(b^2-ac+bcx\right)}{a+bx+cx^2}\,dx}{a^2}+\frac{\int \frac{e^{d+ex}}{x^2}\,dx}{a}-\frac{b\int \frac{e^{d+ex}}{x}\,dx}{a^2}$$

$$= -\frac{e^{d+ex}}{ax}-\frac{be^d\text{Ei}(ex)}{a^2}+\frac{\int\left(\frac{\left(bc+\frac{c\left(b^2-2ac\right)}{\sqrt{b^2-4ac}}\right)e^{d+ex}}{b-\sqrt{b^2-4ac}+2cx}+\frac{\left(bc-\frac{c\left(b^2-2ac\right)}{\sqrt{b^2-4ac}}\right)e^{d+ex}}{b+\sqrt{b^2-4ac}+2cx}\right)dx}{a^2}+\frac{e\int \frac{e^{d+ex}}{x}\,dx}{a}$$

$$= -\frac{e^{d+ex}}{ax}-\frac{be^d\text{Ei}(ex)}{a^2}+\frac{ee^d\text{Ei}(ex)}{a}+\frac{\left(c\left(b-\frac{b^2-2ac}{\sqrt{b^2-4ac}}\right)\right)\int \frac{e^{d+ex}}{b+\sqrt{b^2-4ac}+2cx}\,dx}{a^2}+\frac{\left(c\left(b+\frac{b^2-}{\sqrt{b^2}}\right.\right.}{}$$

$$= -\frac{e^{d+ex}}{ax}-\frac{be^d\text{Ei}(ex)}{a^2}+\frac{ee^d\text{Ei}(ex)}{a}+\frac{\left(b+\frac{b^2-2ac}{\sqrt{b^2-4ac}}\right)e^{d-\frac{\left(b-\sqrt{b^2-4ac}\right)e}{2c}}\text{Ei}\left(\frac{e\left(b-\sqrt{b^2-4ac}+2cx\right)}{2c}\right)}{2a^2}+$$

Mathematica [A] time = 1.14, size = 232, normalized size = 1.09

$$\frac{e^d\left(\frac{e^{-\frac{e\left(\sqrt{b^2-4ac}+b\right)}{2c}}\left(x\left(b\sqrt{b^2-4ac}-2ac+b^2\right)e^{\frac{e\sqrt{b^2-4ac}}{c}}\text{Ei}\left(\frac{e\left(b+2cx-\sqrt{b^2-4ac}\right)}{2c}\right)+x\left(b\sqrt{b^2-4ac}+2ac-b^2\right)\text{Ei}\left(\frac{e\left(b+2cx+\sqrt{b^2-4ac}\right)}{2c}\right)-2a\sqrt{b^2-4ac}\,e^{\frac{e\left(\sqrt{b^2-4ac}+\right.}{2c}}\right.}{x\sqrt{b^2-4ac}}\right.}{2a^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(d + e*x)/(x^2*(a + b*x + c*x^2)),x]
```

```
[Out] (E^d*(-2*(b - a*e)*ExpIntegralEi[e*x] + (-2*a*Sqrt[b^2 - 4*a*c]*E^((e*(b +
Sqrt[b^2 - 4*a*c] + 2*c*x))/(2*c)) + (b^2 - 2*a*c + b*Sqrt[b^2 - 4*a*c])*E^
((Sqrt[b^2 - 4*a*c]*e)/c)*x*ExpIntegralEi[(e*(b - Sqrt[b^2 - 4*a*c] + 2*c*x
))/(2*c)] + (-b^2 + 2*a*c + b*Sqrt[b^2 - 4*a*c])*x*ExpIntegralEi[(e*(b + Sq
rt[b^2 - 4*a*c] + 2*c*x))/(2*c)])/(Sqrt[b^2 - 4*a*c]*E^(((b + Sqrt[b^2 - 4*
a*c])*e)/(2*c))*x)))/(2*a^2)
```

fricas [A] time = 0.41, size = 313, normalized size = 1.48

$$\frac{2\left(\left(ab^2-4\,a^2c\right)e^2-\left(b^3-4\,abc\right)e\right)x\mathrm{Ei}\left(ex\right)e^d-2\left(ab^2-4\,a^2c\right)ee^{(ex+d)}+\left(\left(b^3-4\,abc\right)ex+\left(b^2c-2\,ac^2\right)\sqrt{\frac{\left(b^2-4\,ac\right)e^2}{c^2}}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*x+d)/x^2/(c*x^2+b*x+a),x, algorithm="fricas")
```

```
[Out] 1/2*(2*((a*b^2 - 4*a^2*c)*e^2 - (b^3 - 4*a*b*c)*e)*x*Ei(e*x)*e^d - 2*(a*b^2
 - 4*a^2*c)*e*e^(e*x + d) + ((b^3 - 4*a*b*c)*e*x + (b^2*c - 2*a*c^2)*sqrt((
b^2 - 4*a*c)*e^2/c^2)*x)*Ei(1/2*(2*c*e*x + b*e - c*sqrt((b^2 - 4*a*c)*e^2/c
^2))/c)*e^(1/2*(2*c*d - b*e + c*sqrt((b^2 - 4*a*c)*e^2/c^2))/c) + ((b^3 - 4
*a*b*c)*e*x - (b^2*c - 2*a*c^2)*sqrt((b^2 - 4*a*c)*e^2/c^2)*x)*Ei(1/2*(2*c*
e*x + b*e + c*sqrt((b^2 - 4*a*c)*e^2/c^2))/c)*e^(1/2*(2*c*d - b*e - c*sqrt(
(b^2 - 4*a*c)*e^2/c^2))/c))/((a^2*b^2 - 4*a^3*c)*e*x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{(ex+d)}}{\left(cx^2+bx+a\right)x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*x+d)/x^2/(c*x^2+b*x+a),x, algorithm="giac")
```

```
[Out] integrate(e^(e*x + d)/((c*x^2 + b*x + a)*x^2), x)
```

maple [B] time = 0.03, size = 561, normalized size = 2.65

$$\left(-\frac{(ae-b)\,\mathrm{Ei}\left(1,-ex\right)\mathrm{e}^{d}}{a^2e}-\frac{\mathrm{e}^{ex+d}}{aex}-\frac{-2ace\,\mathrm{Ei}\left(1,\frac{-be+2cd-2(ex+d)c+\sqrt{-4ac\,e^2+b^2e^2}}{2c}\right)\mathrm{e}^{\frac{-be+2cd+\sqrt{-4ac\,e^2+b^2e^2}}{2c}}+2ace\,\mathrm{Ei}\left(1,-\frac{be-}{}\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e*x+d)/x^2/(c*x^2+b*x+a),x)
```

```
[Out] e*(-exp(e*x+d)/a/x/e-1/2*(-2*exp(1/2/c*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/
2)))*Ei(1,1/2*(-2*(e*x+d)*c-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*a*c*e+
exp(1/2/c*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2)))*Ei(1,1/2*(-2*(e*x+d)*c-b
*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*b^2*e+2*exp(-1/2*(b*e-2*c*d+(-4*a*c
*e^2+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(2*(e*x+d)*c+b*e-2*c*d+(-4*a*c*e^2+b^2*e^
2)^(1/2))/c)*a*c*e-exp(-1/2*(b*e-2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,
-1/2*(2*(e*x+d)*c+b*e-2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*b^2*e+exp(1/2/c*
(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2)))*Ei(1,1/2*(-2*(e*x+d)*c-b*e+2*c*d+(
-4*a*c*e^2+b^2*e^2)^(1/2))/c)*(-4*a*c*e^2+b^2*e^2)^(1/2)*b+exp(-1/2*(b*e-2*
c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(2*(e*x+d)*c+b*e-2*c*d+(-4*a*c
*e^2+b^2*e^2)^(1/2))/c)*(-4*a*c*e^2+b^2*e^2)^(1/2)*b)/a^2/e/(-4*a*c*e^2+b^2
*e^2)^(1/2)-1/a^2/e*(a*e-b)*exp(d)*Ei(1,-e*x))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{(ex+d)}}{\left(cx^2 + bx + a\right)x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*x+d)/x^2/(c*x^2+b*x+a),x, algorithm="maxima")
```

```
[Out] integrate(e^(e*x + d)/((c*x^2 + b*x + a)*x^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{e}^{d+e\,x}}{x^2\,\left(c\,x^2+b\,x+a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(d + e*x)/(x^2*(a + b*x + c*x^2)),x)
```

```
[Out] int(exp(d + e*x)/(x^2*(a + b*x + c*x^2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*x+d)/x**2/(c*x**2+b*x+a),x)
```

```
[Out] Timed out
```

3.468 $\int \frac{e^{d+ex}}{x(a+bx+cx^2)}\,dx$

Optimal. Leaf size=169

$$-\frac{\left(\frac{b}{\sqrt{b^2-4ac}}+1\right)e^{d-\frac{e\left(b-\sqrt{b^2-4ac}\right)}{2c}}\text{Ei}\left(\frac{e\left(b+2cx-\sqrt{b^2-4ac}\right)}{2c}\right)}{2a}-\frac{\left(1-\frac{b}{\sqrt{b^2-4ac}}\right)e^{d-\frac{e\left(\sqrt{b^2-4ac}+b\right)}{2c}}\text{Ei}\left(\frac{e\left(b+2cx+\sqrt{b^2-4ac}\right)}{2c}\right)}{2a}+\frac{e^d\text{Ei}(ex)}{a}$$

```
[Out] exp(d)*Ei(e*x)/a-1/2*exp(d-1/2*e*(b+(-4*a*c+b^2)^(1/2))/c)*Ei(1/2*e*(b+2*c*
x+(-4*a*c+b^2)^(1/2))/c)*(1-b/(-4*a*c+b^2)^(1/2))/a-1/2*exp(d-1/2*e*(b-(-4*
a*c+b^2)^(1/2))/c)*Ei(1/2*e*(b+2*c*x-(-4*a*c+b^2)^(1/2))/c)*(1+b/(-4*a*c+b^
2)^(1/2))/a
```

Rubi [A] time = 0.41, antiderivative size = 169, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087, Rules used = {2270, 2178}

$$-\frac{\left(\frac{b}{\sqrt{b^2-4ac}}+1\right)e^{d-\frac{e\left(b-\sqrt{b^2-4ac}\right)}{2c}}\text{Ei}\left(\frac{e\left(b+2cx-\sqrt{b^2-4ac}\right)}{2c}\right)}{2a}-\frac{\left(1-\frac{b}{\sqrt{b^2-4ac}}\right)e^{d-\frac{e\left(\sqrt{b^2-4ac}+b\right)}{2c}}\text{Ei}\left(\frac{e\left(b+2cx+\sqrt{b^2-4ac}\right)}{2c}\right)}{2a}+\frac{e^d\text{Ei}(ex)}{a}$$

Antiderivative was successfully verified.

```
[In] Int[E^(d + e*x)/(x*(a + b*x + c*x^2)),x]
```

```
[Out] (E^d*ExpIntegralEi[e*x])/a - ((1 + b/Sqrt[b^2 - 4*a*c])*E^(d - ((b - Sqrt[b
^2 - 4*a*c])*e)/(2*c))*ExpIntegralEi[(e*(b - Sqrt[b^2 - 4*a*c] + 2*c*x))/(2
*c)])/(2*a) - ((1 - b/Sqrt[b^2 - 4*a*c])*E^(d - ((b + Sqrt[b^2 - 4*a*c])*e)
/(2*c))*ExpIntegralEi[(e*(b + Sqrt[b^2 - 4*a*c] + 2*c*x))/(2*c)])/(2*a)
```

Rule 2178

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - (c*f)/d))*ExpIntegralEi[(f*g*(c + d*x)*Log[F])/d])/d, x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2270

```
Int[((F_)^((g_.)*((d_.) + (e_.)*(x_))^(n_.))*(u_)^(m_.))/((a_.) + (b_.)*(x_
) + (c_)*(x_)^2), x_Symbol] :> Int[ExpandIntegrand[F^(g*(d + e*x)^n), u^m/(
a + b*x + c*x^2), x], x] /; FreeQ[{F, a, b, c, d, e, g, n}, x] && Polynomia
lQ[u, x] && IntegerQ[m]
```

Rubi steps

$$\int \frac{e^{d+ex}}{x\left(a+bx+cx^2\right)}\,dx = \int \left(\frac{e^{d+ex}}{ax}+\frac{e^{d+ex}(-b-cx)}{a\left(a+bx+cx^2\right)}\right)dx$$

$$= \frac{\int \frac{e^{d+ex}}{x}\,dx}{a}+\frac{\int \frac{e^{d+ex}(-b-cx)}{a+bx+cx^2}\,dx}{a}$$

$$= \frac{e^d \operatorname{Ei}(ex)}{a}+\frac{\int \left(\frac{\left(-c-\frac{bc}{\sqrt{b^2-4ac}}\right)e^{d+ex}}{b-\sqrt{b^2-4ac}+2cx}+\frac{\left(-c+\frac{bc}{\sqrt{b^2-4ac}}\right)e^{d+ex}}{b+\sqrt{b^2-4ac}+2cx}\right)dx}{a}$$

$$= \frac{e^d \operatorname{Ei}(ex)}{a}-\frac{\left(c\left(1-\frac{b}{\sqrt{b^2-4ac}}\right)\right)\int \frac{e^{d+ex}}{b+\sqrt{b^2-4ac}+2cx}\,dx}{a}-\frac{\left(c\left(1+\frac{b}{\sqrt{b^2-4ac}}\right)\right)\int \frac{e^{d+ex}}{b-\sqrt{b^2-4ac}+2cx}\,dx}{a}$$

$$= \frac{e^d \operatorname{Ei}(ex)}{a}-\frac{\left(1+\frac{b}{\sqrt{b^2-4ac}}\right)e^{d-\frac{\left(b-\sqrt{b^2-4ac}\right)e}{2c}}\operatorname{Ei}\left(\frac{e\left(b-\sqrt{b^2-4ac}+2cx\right)}{2c}\right)}{2a}-\frac{\left(1-\frac{b}{\sqrt{b^2-4ac}}\right)e^{d-\frac{\left(b+\sqrt{b^2-4\right.}}{2c}}}{2}$$

Mathematica [A] time = 0.57, size = 163, normalized size = 0.96

$$\frac{e^d\left(\frac{e^{-\frac{e\left(\sqrt{b^2-4ac}+b\right)}{2c}}\left(\left(b-\sqrt{b^2-4ac}\right)\operatorname{Ei}\left(\frac{e\left(b+2cx+\sqrt{b^2-4ac}\right)}{2c}\right)-\left(\sqrt{b^2-4ac}+b\right)e^{\frac{e\sqrt{b^2-4ac}}{c}}\operatorname{Ei}\left(\frac{e\left(b+2cx-\sqrt{b^2-4ac}\right)}{2c}\right)\right)}{\sqrt{b^2-4ac}}+2\operatorname{Ei}(ex)\right)}{2a}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(d + e*x)/(x*(a + b*x + c*x^2)),x]
```

```
[Out] (E^d*(2*ExpIntegralEi[e*x] + (-((b + Sqrt[b^2 - 4*a*c])*E^((Sqrt[b^2 - 4*a*
c]*e)/c)*ExpIntegralEi[(e*(b - Sqrt[b^2 - 4*a*c] + 2*c*x))/(2*c)]) + (b - S
qrt[b^2 - 4*a*c])*ExpIntegralEi[(e*(b + Sqrt[b^2 - 4*a*c] + 2*c*x))/(2*c)])
/(Sqrt[b^2 - 4*a*c]*E^(((b + Sqrt[b^2 - 4*a*c])*e)/(2*c)))))/(2*a)
```

fricas [A] time = 0.41, size = 241, normalized size = 1.43

$$\frac{2\left(b^2-4\,ac\right)e\operatorname{Ei}\left(ex\right)e^d-\left(bc\sqrt{\frac{\left(b^2-4\,ac\right)e^2}{c^2}}+\left(b^2-4\,ac\right)e\right)\operatorname{Ei}\left(\frac{2\,cex+be-c\sqrt{\frac{\left(b^2-4\,ac\right)e^2}{c^2}}}{2\,c}\right)e^{\left(\frac{2\,cd-be+c\sqrt{\frac{\left(b^2-4\,ac\right)e^2}{c^2}}}{2\,c}\right)}+\left(bc\sqrt{\frac{\left(b^2-4\right.}{c}}\right.}{2\left(ab^2-4\,a^2c\right)e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*x+d)/x/(c*x^2+b*x+a),x, algorithm="fricas")
```

```
[Out] 1/2*(2*(b^2 - 4*a*c)*e*Ei(e*x)*e^d - (b*c*sqrt((b^2 - 4*a*c)*e^2/c^2) + (b^
2 - 4*a*c)*e)*Ei(1/2*(2*c*e*x + b*e - c*sqrt((b^2 - 4*a*c)*e^2/c^2))/c)*e^(
1/2*(2*c*d - b*e + c*sqrt((b^2 - 4*a*c)*e^2/c^2))/c) + (b*c*sqrt((b^2 - 4*a
*c)*e^2/c^2) - (b^2 - 4*a*c)*e)*Ei(1/2*(2*c*e*x + b*e + c*sqrt((b^2 - 4*a*c
)*e^2/c^2))/c)*e^(1/2*(2*c*d - b*e - c*sqrt((b^2 - 4*a*c)*e^2/c^2))/c))/((a
*b^2 - 4*a^2*c)*e)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{(ex+d)}}{\left(cx^2+bx+a\right)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*x+d)/x/(c*x^2+b*x+a),x, algorithm="giac")
```

```
[Out] integrate(e^(e*x + d)/((c*x^2 + b*x + a)*x), x)
```

maple [B] time = 0.03, size = 369, normalized size = 2.18

$$-\frac{\mathrm{Ei}\left(1,-ex\right)\mathrm{e}^{d}}{a}+\frac{be\,\mathrm{Ei}\left(1,\frac{-be+2cd-2(ex+d)c+\sqrt{-4ac\,e^2+b^2e^2}}{2c}\right)\mathrm{e}^{\frac{-be+2cd+\sqrt{-4ac\,e^2+b^2e^2}}{2c}}-be\,\mathrm{Ei}\left(1,-\frac{be-2cd+2(ex+d)c+\sqrt{-4ac\,e^2+b^2e^2}}{2c}\right)}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e*x+d)/x/(c*x^2+b*x+a),x)
```

```
[Out] 1/2*(exp(1/2*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,1/2*(-b*e+2*c*
d-2*(e*x+d)*c+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*b*e-exp(-1/2*(b*e-2*c*d+(-4*a*
c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+2*(e*x+d)*c+(-4*a*c*e^2+b^2*e
^2)^(1/2))/c)*b*e+exp(1/2*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,1
/2*(-b*e+2*c*d-2*(e*x+d)*c+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*(-4*a*c*e^2+b^2*e
^2)^(1/2)+exp(-1/2*(b*e-2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(b*e
-2*c*d+2*(e*x+d)*c+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*(-4*a*c*e^2+b^2*e^2)^(1/2
))/a/(-4*a*c*e^2+b^2*e^2)^(1/2)-1/a*exp(d)*Ei(1,-e*x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{(ex+d)}}{\left(cx^2+bx+a\right)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*x+d)/x/(c*x^2+b*x+a),x, algorithm="maxima")
```

```
[Out] integrate(e^(e*x + d)/((c*x^2 + b*x + a)*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{e^{d+e\,x}}{x\,\left(c\,x^2+b\,x+a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(d + e*x)/(x*(a + b*x + c*x^2)),x)
```

```
[Out] int(exp(d + e*x)/(x*(a + b*x + c*x^2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$e^{d}\int \frac{e^{ex}}{ax+bx^{2}+cx^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*x+d)/x/(c*x**2+b*x+a),x)
```

```
[Out] exp(d)*Integral(exp(e*x)/(a*x + b*x**2 + c*x**3), x)
```

3.469 $\int \frac{e^{d+ex}}{a+bx+cx^2}\,dx$

Optimal. Leaf size=138

$$\frac{e^{d-\frac{e\left(b-\sqrt{b^2-4ac}\right)}{2c}}\text{Ei}\left(\frac{e\left(b+2cx-\sqrt{b^2-4ac}\right)}{2c}\right)}{\sqrt{b^2-4ac}}-\frac{e^{d-\frac{e\left(\sqrt{b^2-4ac}+b\right)}{2c}}\text{Ei}\left(\frac{e\left(b+2cx+\sqrt{b^2-4ac}\right)}{2c}\right)}{\sqrt{b^2-4ac}}$$

```
[Out] exp(d-1/2*e*(b-(-4*a*c+b^2)^(1/2))/c)*Ei(1/2*e*(b+2*c*x-(-4*a*c+b^2)^(1/2))
/c)/(-4*a*c+b^2)^(1/2)-exp(d-1/2*e*(b+(-4*a*c+b^2)^(1/2))/c)*Ei(1/2*e*(b+2*
c*x+(-4*a*c+b^2)^(1/2))/c)/(-4*a*c+b^2)^(1/2)
```

Rubi [A] time = 0.19, antiderivative size = 138, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {2268, 2178}

$$\frac{e^{d-\frac{e\left(b-\sqrt{b^2-4ac}\right)}{2c}}\text{Ei}\left(\frac{e\left(b+2cx-\sqrt{b^2-4ac}\right)}{2c}\right)}{\sqrt{b^2-4ac}}-\frac{e^{d-\frac{e\left(\sqrt{b^2-4ac}+b\right)}{2c}}\text{Ei}\left(\frac{e\left(b+2cx+\sqrt{b^2-4ac}\right)}{2c}\right)}{\sqrt{b^2-4ac}}$$

Antiderivative was successfully verified.

```
[In] Int[E^(d + e*x)/(a + b*x + c*x^2),x]
```

```
[Out] (E^(d - ((b - Sqrt[b^2 - 4*a*c])*e)/(2*c))*ExpIntegralEi[(e*(b - Sqrt[b^2 -
 4*a*c] + 2*c*x))/(2*c)])/Sqrt[b^2 - 4*a*c] - (E^(d - ((b + Sqrt[b^2 - 4*a*
c])*e)/(2*c))*ExpIntegralEi[(e*(b + Sqrt[b^2 - 4*a*c] + 2*c*x))/(2*c)])/Sqr
t[b^2 - 4*a*c]
```

Rule 2178

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - (c*f)/d))*ExpIntegralEi[(f*g*(c + d*x)*Log[F])/d])/d, x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2268

```
Int[(F_)^((g_.)*((d_.) + (e_.)*(x_))^(n_.))/((a_.) + (b_.)*(x_) + (c_.)*(x_
)^2), x_Symbol] :> Int[ExpandIntegrand[F^(g*(d + e*x)^n), 1/(a + b*x + c*x^
2), x], x] /; FreeQ[{F, a, b, c, d, e, g, n}, x]
```

Rubi steps

$$\int \frac{e^{d+ex}}{a+bx+cx^2}\,dx = \int \left(\frac{2ce^{d+ex}}{\sqrt{b^2-4ac}\left(b-\sqrt{b^2-4ac}+2cx\right)} - \frac{2ce^{d+ex}}{\sqrt{b^2-4ac}\left(b+\sqrt{b^2-4ac}+2cx\right)} \right) dx$$

$$= \frac{(2c)\int \frac{e^{d+ex}}{b-\sqrt{b^2-4ac}+2cx}\,dx}{\sqrt{b^2-4ac}} - \frac{(2c)\int \frac{e^{d+ex}}{b+\sqrt{b^2-4ac}+2cx}\,dx}{\sqrt{b^2-4ac}}$$

$$= \frac{e^{d-\frac{\left(b-\sqrt{b^2-4ac}\right)e}{2c}}\text{Ei}\left(\frac{e\left(b-\sqrt{b^2-4ac}+2cx\right)}{2c}\right)}{\sqrt{b^2-4ac}} - \frac{e^{d-\frac{\left(b+\sqrt{b^2-4ac}\right)e}{2c}}\text{Ei}\left(\frac{e\left(b+\sqrt{b^2-4ac}+2cx\right)}{2c}\right)}{\sqrt{b^2-4ac}}$$

Mathematica [A] time = 0.15, size = 127, normalized size = 0.92

$$\frac{e^{\frac{e\left(\sqrt{b^2-4ac}-b\right)}{2c}+d}\text{Ei}\left(\frac{e\left(b+2cx-\sqrt{b^2-4ac}\right)}{2c}\right) - e^{d-\frac{e\left(\sqrt{b^2-4ac}+b\right)}{2c}}\text{Ei}\left(\frac{e\left(b+2cx+\sqrt{b^2-4ac}\right)}{2c}\right)}{\sqrt{b^2-4ac}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(d + e*x)/(a + b*x + c*x^2),x]
```

```
[Out] (E^(d + ((-b + Sqrt[b^2 - 4*a*c])*e)/(2*c))*ExpIntegralEi[(e*(b - Sqrt[b^2
- 4*a*c] + 2*c*x))/(2*c)] - E^(d - ((b + Sqrt[b^2 - 4*a*c])*e)/(2*c))*ExpIn
tegralEi[(e*(b + Sqrt[b^2 - 4*a*c] + 2*c*x))/(2*c)])/Sqrt[b^2 - 4*a*c]
```

fricas [A] time = 0.43, size = 192, normalized size = 1.39

$$\frac{c\sqrt{\frac{\left(b^2-4\,ac\right)e^2}{c^2}}\,\text{Ei}\left(\frac{2\,cex+be-c\sqrt{\frac{\left(b^2-4\,ac\right)e^2}{c^2}}}{2\,c}\right)e^{\left(\frac{2\,cd-be+c\sqrt{\frac{\left(b^2-4\,ac\right)e^2}{c^2}}}{2\,c}\right)} - c\sqrt{\frac{\left(b^2-4\,ac\right)e^2}{c^2}}\,\text{Ei}\left(\frac{2\,cex+be+c\sqrt{\frac{\left(b^2-4\,ac\right)e^2}{c^2}}}{2\,c}\right)e^{\left(\frac{2\,cd-be-c\sqrt{\frac{\left(b^2-4\,ac\right)}{c^2}}}{2\,c}\right.}}{\left(b^2-4\,ac\right)e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*x+d)/(c*x^2+b*x+a),x, algorithm="fricas")
```

```
[Out] (c*sqrt((b^2 - 4*a*c)*e^2/c^2)*Ei(1/2*(2*c*e*x + b*e - c*sqrt((b^2 - 4*a*c)
*e^2/c^2))/c)*e^(1/2*(2*c*d - b*e + c*sqrt((b^2 - 4*a*c)*e^2/c^2))/c) - c*s
qrt((b^2 - 4*a*c)*e^2/c^2)*Ei(1/2*(2*c*e*x + b*e + c*sqrt((b^2 - 4*a*c)*e^2
```

/c^2))/c)*e^(1/2*(2*c*d - b*e - c*sqrt((b^2 - 4*a*c)*e^2/c^2))/c))/((b^2 - 4*a*c)*e)

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{(ex+d)}}{cx^2+bx+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*x+d)/(c*x^2+b*x+a),x, algorithm="giac")
```

```
[Out] integrate(e^(e*x + d)/(c*x^2 + b*x + a), x)
```

maple [A] time = 0.02, size = 169, normalized size = 1.22

$$-\frac{\left(\mathrm{Ei}\left(1,\frac{-be+2cd-2(ex+d)c+\sqrt{-4ac\,e^2+b^2e^2}}{2c}\right)\mathrm{e}^{\frac{-be+2cd+\sqrt{-4ac\,e^2+b^2e^2}}{2c}}-\mathrm{Ei}\left(1,-\frac{be-2cd+2(ex+d)c+\sqrt{-4ac\,e^2+b^2e^2}}{2c}\right)\mathrm{e}^{-\frac{be-2cd+\sqrt{-4ac\,e^2+b^2e^2}}{2c}}\right)}{\sqrt{-4ac\,e^2+b^2e^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e*x+d)/(c*x^2+b*x+a),x)
```

```
[Out] -e*(exp(1/2*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,1/2*(-b*e+2*c*d
-2*(e*x+d)*c+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)-exp(-1/2*(b*e-2*c*d+(-4*a*c*e^2
+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+2*(e*x+d)*c+(-4*a*c*e^2+b^2*e^2)^(
1/2))/c))/(-4*a*c*e^2+b^2*e^2)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{(ex+d)}}{cx^2+bx+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*x+d)/(c*x^2+b*x+a),x, algorithm="maxima")
```

```
[Out] integrate(e^(e*x + d)/(c*x^2 + b*x + a), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{e}^{d+e\,x}}{c\,x^2+b\,x+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(d + e*x)/(a + b*x + c*x^2),x)
```

```
[Out] int(exp(d + e*x)/(a + b*x + c*x^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$e^{d}\int \frac{e^{ex}}{a + bx + cx^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*x+d)/(c*x**2+b*x+a),x)
```

```
[Out] exp(d)*Integral(exp(e*x)/(a + b*x + c*x**2), x)
```

3.470 $\int \frac{e^{d+ex}x}{a+bx+cx^2}\,dx$

Optimal. Leaf size=158

$$\frac{\left(1-\frac{b}{\sqrt{b^2-4ac}}\right)e^{d-\frac{e\left(b-\sqrt{b^2-4ac}\right)}{2c}}\mathrm{Ei}\left(\frac{e\left(b+2cx-\sqrt{b^2-4ac}\right)}{2c}\right)}{2c}+\frac{\left(\frac{b}{\sqrt{b^2-4ac}}+1\right)e^{d-\frac{e\left(\sqrt{b^2-4ac}+b\right)}{2c}}\mathrm{Ei}\left(\frac{e\left(b+2cx+\sqrt{b^2-4ac}\right)}{2c}\right)}{2c}$$

```
[Out] 1/2*exp(d-1/2*e*(b-(-4*a*c+b^2)^(1/2))/c)*Ei(1/2*e*(b+2*c*x-(-4*a*c+b^2)^(1
/2))/c)*(1-b/(-4*a*c+b^2)^(1/2))/c+1/2*exp(d-1/2*e*(b+(-4*a*c+b^2)^(1/2))/c
)*Ei(1/2*e*(b+2*c*x+(-4*a*c+b^2)^(1/2))/c)*(1+b/(-4*a*c+b^2)^(1/2))/c
```

Rubi [A] time = 0.21, antiderivative size = 158, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2270, 2178}

$$\frac{\left(1-\frac{b}{\sqrt{b^2-4ac}}\right)e^{d-\frac{e\left(b-\sqrt{b^2-4ac}\right)}{2c}}\mathrm{Ei}\left(\frac{e\left(b+2cx-\sqrt{b^2-4ac}\right)}{2c}\right)}{2c}+\frac{\left(\frac{b}{\sqrt{b^2-4ac}}+1\right)e^{d-\frac{e\left(\sqrt{b^2-4ac}+b\right)}{2c}}\mathrm{Ei}\left(\frac{e\left(b+2cx+\sqrt{b^2-4ac}\right)}{2c}\right)}{2c}$$

Antiderivative was successfully verified.

```
[In] Int[(E^(d + e*x)*x)/(a + b*x + c*x^2),x]
```

```
[Out] ((1 - b/Sqrt[b^2 - 4*a*c])*E^(d - ((b - Sqrt[b^2 - 4*a*c])*e)/(2*c))*ExpInt
egralEi[(e*(b - Sqrt[b^2 - 4*a*c] + 2*c*x))/(2*c)])/(2*c) + ((1 + b/Sqrt[b^
2 - 4*a*c])*E^(d - ((b + Sqrt[b^2 - 4*a*c])*e)/(2*c))*ExpIntegralEi[(e*(b +
 Sqrt[b^2 - 4*a*c] + 2*c*x))/(2*c)])/(2*c)
```

Rule 2178

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - (c*f)/d))*ExpIntegralEi[(f*g*(c + d*x)*Log[F])/d])/d, x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2270

```
Int[((F_)^((g_.)*((d_.) + (e_.)*(x_))^(n_.))*(u_)^(m_.))/((a_.) + (b_.)*(x_
) + (c_)*(x_)^2), x_Symbol] :> Int[ExpandIntegrand[F^(g*(d + e*x)^n), u^m/(
a + b*x + c*x^2), x], x] /; FreeQ[{F, a, b, c, d, e, g, n}, x] && Polynomia
lQ[u, x] && IntegerQ[m]
```

Rubi steps

$$\int \frac{e^{d+ex}x}{a+bx+cx^2}\,dx = \int \left(\frac{\left(1-\frac{b}{\sqrt{b^2-4ac}}\right)e^{d+ex}}{b-\sqrt{b^2-4ac}+2cx} + \frac{\left(1+\frac{b}{\sqrt{b^2-4ac}}\right)e^{d+ex}}{b+\sqrt{b^2-4ac}+2cx} \right) dx$$

$$= \left(1-\frac{b}{\sqrt{b^2-4ac}}\right)\int \frac{e^{d+ex}}{b-\sqrt{b^2-4ac}+2cx}\,dx + \left(1+\frac{b}{\sqrt{b^2-4ac}}\right)\int \frac{e^{d+ex}}{b+\sqrt{b^2-4ac}+2cx}$$

$$= \frac{\left(1-\frac{b}{\sqrt{b^2-4ac}}\right)e^{d-\frac{\left(b-\sqrt{b^2-4ac}\right)e}{2c}}\text{Ei}\left(\frac{e\left(b-\sqrt{b^2-4ac}+2cx\right)}{2c}\right)}{2c} + \frac{\left(1+\frac{b}{\sqrt{b^2-4ac}}\right)e^{d-\frac{\left(b+\sqrt{b^2-4ac}\right)e}{2c}}\text{Ei}\left(\frac{e\left(b+\sqrt{b^2-\right.}}{2}\right)}{2c}$$

Mathematica [A] time = 0.19, size = 153, normalized size = 0.97

$$\frac{e^{d-\frac{e\left(\sqrt{b^2-4ac}+b\right)}{2c}}\left(\left(\sqrt{b^2-4ac}-b\right)e^{\frac{e\sqrt{b^2-4ac}}{c}}\text{Ei}\left(\frac{e\left(b+2cx-\sqrt{b^2-4ac}\right)}{2c}\right)+\left(\sqrt{b^2-4ac}+b\right)\text{Ei}\left(\frac{e\left(b+2cx+\sqrt{b^2-4ac}\right)}{2c}\right)\right)}{2c\sqrt{b^2-4ac}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^(d + e*x)*x)/(a + b*x + c*x^2),x]
```

```
[Out] (E^(d - ((b + Sqrt[b^2 - 4*a*c])*e)/(2*c))*((-b + Sqrt[b^2 - 4*a*c])*E^((Sq
rt[b^2 - 4*a*c]*e)/c)*ExpIntegralEi[(e*(b - Sqrt[b^2 - 4*a*c] + 2*c*x))/(2*
c)] + (b + Sqrt[b^2 - 4*a*c])*ExpIntegralEi[(e*(b + Sqrt[b^2 - 4*a*c] + 2*c
*x))/(2*c)]))/(2*c*Sqrt[b^2 - 4*a*c])
```

fricas [A] time = 0.42, size = 224, normalized size = 1.42

$$-\frac{\left(bc\sqrt{\frac{\left(b^2-4\,ac\right)e^2}{c^2}}-\left(b^2-4\,ac\right)e\right)\text{Ei}\left(\frac{2\,cex+be-c\sqrt{\frac{\left(b^2-4\,ac\right)e^2}{c^2}}}{2\,c}\right)e^{\left(\frac{2\,cd-be+c\sqrt{\frac{\left(b^2-4\,ac\right)e^2}{c^2}}}{2\,c}\right)}-\left(bc\sqrt{\frac{\left(b^2-4\,ac\right)e^2}{c^2}}+\left(b^2-4\,ac\right)e\right)\text{Ei}}{2\left(b^2c-4\,ac^2\right)e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*x+d)*x/(c*x^2+b*x+a),x, algorithm="fricas")
```

```
[Out] -1/2*((b*c*sqrt((b^2 - 4*a*c)*e^2/c^2) - (b^2 - 4*a*c)*e)*Ei(1/2*(2*c*e*x +
 b*e - c*sqrt((b^2 - 4*a*c)*e^2/c^2))/c)*e^(1/2*(2*c*d - b*e + c*sqrt((b^2
- 4*a*c)*e^2/c^2))/c) - (b*c*sqrt((b^2 - 4*a*c)*e^2/c^2) + (b^2 - 4*a*c)*e)
```

```
*Ei(1/2*(2*c*e*x + b*e + c*sqrt((b^2 - 4*a*c)*e^2/c^2))/c)*e^(1/2*(2*c*d -
b*e - c*sqrt((b^2 - 4*a*c)*e^2/c^2))/c))/((b^2*c - 4*a*c^2)*e)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{xe^{(ex+d)}}{cx^2+bx+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*x+d)*x/(c*x^2+b*x+a),x, algorithm="giac")
```

```
[Out] integrate(x*e^(e*x + d)/(c*x^2 + b*x + a), x)
```

maple [B] time = 0.02, size = 685, normalized size = 4.34

$$\frac{\frac{\left(\mathrm{Ei}\left(1,\frac{-be+2cd-2(ex+d)c+\sqrt{-4ac\,e^2+b^2e^2}}{2c}\right)\mathrm{e}^{\frac{-be+2cd+\sqrt{-4ac\,e^2+b^2e^2}}{2c}}-\mathrm{Ei}\left(1,-\frac{be-2cd+2(ex+d)c+\sqrt{-4ac\,e^2+b^2e^2}}{2c}\right)\mathrm{e}^{-\frac{be-2cd+\sqrt{-4ac\,e^2+b^2e^2}}{2c}}\right)d\,e^2}{\sqrt{-4ac\,e^2+b^2e^2}}-\frac{\left(-be\,\mathrm{Ei}\left(1,\frac{-be+2c}{}\right.\right.}{}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e*x+d)*x/(c*x^2+b*x+a),x)
```

```
[Out] 1/e^2*(-1/2*e^2*(-exp(1/2*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,1
/2*(-b*e+2*c*d-2*(e*x+d)*c+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*b*e+2*exp(1/2*(-b
*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,1/2*(-b*e+2*c*d-2*(e*x+d)*c+(-
4*a*c*e^2+b^2*e^2)^(1/2))/c)*c*d+exp(-1/2*(b*e-2*c*d+(-4*a*c*e^2+b^2*e^2)^(
1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+2*(e*x+d)*c+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*b*
e-2*exp(-1/2*(b*e-2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d
+2*(e*x+d)*c+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*c*d+exp(1/2*(-b*e+2*c*d+(-4*a*c
*e^2+b^2*e^2)^(1/2))/c)*Ei(1,1/2*(-b*e+2*c*d-2*(e*x+d)*c+(-4*a*c*e^2+b^2*e^
2)^(1/2))/c)*(-4*a*c*e^2+b^2*e^2)^(1/2)+exp(-1/2*(b*e-2*c*d+(-4*a*c*e^2+b^2
*e^2)^(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+2*(e*x+d)*c+(-4*a*c*e^2+b^2*e^2)^(1/2)
)/c)*(-4*a*c*e^2+b^2*e^2)^(1/2))/c/(-4*a*c*e^2+b^2*e^2)^(1/2)+d*e^2*(exp(1/
2*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,1/2*(-b*e+2*c*d-2*(e*x+d)
*c+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)-exp(-1/2*(b*e-2*c*d+(-4*a*c*e^2+b^2*e^2)^
(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+2*(e*x+d)*c+(-4*a*c*e^2+b^2*e^2)^(1/2))/c))/
(-4*a*c*e^2+b^2*e^2)^(1/2))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{xe^{(ex+d)}}{cex^2+bex+ae}+\int \frac{\left(cx^2e^d-ae^d\right)e^{(ex)}}{c^2ex^4+2\,bcex^3+2\,abex+a^2e+\left(b^2e+2\,ace\right)x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*x+d)*x/(c*x^2+b*x+a),x, algorithm="maxima")
```

```
[Out] x*e^(e*x + d)/(c*e*x^2 + b*e*x + a*e) + integrate((c*x^2*e^d - a*e^d)*e^(e*
x)/(c^2*e*x^4 + 2*b*c*e*x^3 + 2*a*b*e*x + a^2*e + (b^2*e + 2*a*c*e)*x^2), x
)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\,\mathrm{e}^{d+e\,x}}{c\,x^2+b\,x+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*exp(d + e*x))/(a + b*x + c*x^2),x)
```

```
[Out] int((x*exp(d + e*x))/(a + b*x + c*x^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$e^{d}\int \frac{xe^{ex}}{a+bx+cx^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*x+d)*x/(c*x**2+b*x+a),x)
```

```
[Out] exp(d)*Integral(x*exp(e*x)/(a + b*x + c*x**2), x)
```

3.471 $\int \frac{e^{d+ex}x^2}{a+bx+cx^2}\,dx$

Optimal. Leaf size=186

$$-\frac{\left(b-\frac{b^2-2ac}{\sqrt{b^2-4ac}}\right)e^{d-\frac{e\left(b-\sqrt{b^2-4ac}\right)}{2c}}\operatorname{Ei}\left(\frac{e\left(b+2cx-\sqrt{b^2-4ac}\right)}{2c}\right)}{2c^2}-\frac{\left(\frac{b^2-2ac}{\sqrt{b^2-4ac}}+b\right)e^{d-\frac{e\left(\sqrt{b^2-4ac}+b\right)}{2c}}\operatorname{Ei}\left(\frac{e\left(b+2cx+\sqrt{b^2-4ac}\right)}{2c}\right)}{2c^2}+\frac{e^{d+ex}}{ce}$$

```
[Out] exp(e*x+d)/c/e-1/2*exp(d-1/2*e*(b-(-4*a*c+b^2)^(1/2))/c)*Ei(1/2*e*(b+2*c*x-
(-4*a*c+b^2)^(1/2))/c)*(b+(2*a*c-b^2)/(-4*a*c+b^2)^(1/2))/c^2-1/2*exp(d-1/2
*e*(b+(-4*a*c+b^2)^(1/2))/c)*Ei(1/2*e*(b+2*c*x+(-4*a*c+b^2)^(1/2))/c)*(b+(-
2*a*c+b^2)/(-4*a*c+b^2)^(1/2))/c^2
```

Rubi [A] time = 0.41, antiderivative size = 186, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used = {2270, 2194, 2178}

$$-\frac{\left(b-\frac{b^2-2ac}{\sqrt{b^2-4ac}}\right)e^{d-\frac{e\left(b-\sqrt{b^2-4ac}\right)}{2c}}\operatorname{Ei}\left(\frac{e\left(b+2cx-\sqrt{b^2-4ac}\right)}{2c}\right)}{2c^2}-\frac{\left(\frac{b^2-2ac}{\sqrt{b^2-4ac}}+b\right)e^{d-\frac{e\left(\sqrt{b^2-4ac}+b\right)}{2c}}\operatorname{Ei}\left(\frac{e\left(b+2cx+\sqrt{b^2-4ac}\right)}{2c}\right)}{2c^2}+\frac{e^{d+ex}}{ce}$$

Antiderivative was successfully verified.

```
[In] Int[(E^(d + e*x)*x^2)/(a + b*x + c*x^2),x]
```

```
[Out] E^(d + e*x)/(c*e) - ((b - (b^2 - 2*a*c)/Sqrt[b^2 - 4*a*c])*E^(d - ((b - Sqr
t[b^2 - 4*a*c])*e)/(2*c))*ExpIntegralEi[(e*(b - Sqrt[b^2 - 4*a*c] + 2*c*x))
/(2*c)])/(2*c^2) - ((b + (b^2 - 2*a*c)/Sqrt[b^2 - 4*a*c])*E^(d - ((b + Sqrt
[b^2 - 4*a*c])*e)/(2*c))*ExpIntegralEi[(e*(b + Sqrt[b^2 - 4*a*c] + 2*c*x))/
(2*c)])/(2*c^2)
```

Rule 2178

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - (c*f)/d))*ExpIntegralEi[(f*g*(c + d*x)*Log[F])/d])/d, x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2194

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 2270

```
Int[((F_)^((g_.)*((d_.) + (e_.)*(x_))^(n_.))*(u_)^(m_.))/((a_.) + (b_.)*(x_
) + (c_)*(x_)^2), x_Symbol] :> Int[ExpandIntegrand[F^(g*(d + e*x)^n), u^m/(
a + b*x + c*x^2), x], x] /; FreeQ[{F, a, b, c, d, e, g, n}, x] && Polynomia
lQ[u, x] && IntegerQ[m]
```

Rubi steps

$$\begin{aligned}\int \frac{e^{d+ex}x^2}{a+bx+cx^2}\,dx &= \int \left(\frac{e^{d+ex}}{c} - \frac{e^{d+ex}(a+bx)}{c\left(a+bx+cx^2\right)}\right)dx \\ &= \frac{\int e^{d+ex}\,dx}{c} - \frac{\int \frac{e^{d+ex}(a+bx)}{a+bx+cx^2}\,dx}{c} \\ &= \frac{e^{d+ex}}{ce} - \frac{\int \left(\frac{\left(b+\frac{-b^2+2ac}{\sqrt{b^2-4ac}}\right)e^{d+ex}}{b-\sqrt{b^2-4ac}+2cx} + \frac{\left(b-\frac{-b^2+2ac}{\sqrt{b^2-4ac}}\right)e^{d+ex}}{b+\sqrt{b^2-4ac}+2cx}\right)dx}{c} \\ &= \frac{e^{d+ex}}{ce} - \frac{\left(b-\frac{b^2-2ac}{\sqrt{b^2-4ac}}\right)\int \frac{e^{d+ex}}{b-\sqrt{b^2-4ac}+2cx}\,dx}{c} - \frac{\left(b+\frac{b^2-2ac}{\sqrt{b^2-4ac}}\right)\int \frac{e^{d+ex}}{b+\sqrt{b^2-4ac}+2cx}\,dx}{c} \\ &= \frac{e^{d+ex}}{ce} - \frac{\left(b-\frac{b^2-2ac}{\sqrt{b^2-4ac}}\right)e^{d-\frac{\left(b-\sqrt{b^2-4ac}\right)e}{2c}}\text{Ei}\left(\frac{e\left(b-\sqrt{b^2-4ac}+2cx\right)}{2c}\right)}{2c^2} - \frac{\left(b+\frac{b^2-2ac}{\sqrt{b^2-4ac}}\right)e^{d-\frac{\left(b+\sqrt{b^2-4ac}\right)e}{2c}}\text{Ei}\left(\right.}{2c^2}\end{aligned}$$

Mathematica [A] time = 0.53, size = 217, normalized size = 1.17

$$-\frac{e^{d-\frac{e\left(\sqrt{b^2-4ac}+b\right)}{2c}}\left(e\left(b\sqrt{b^2-4ac}+2ac-b^2\right)e^{\frac{e\sqrt{b^2-4ac}}{c}}\text{Ei}\left(\frac{e\left(b+2cx-\sqrt{b^2-4ac}\right)}{2c}\right)+e\left(b\sqrt{b^2-4ac}-2ac+b^2\right)\text{Ei}\left(\frac{e\left(b+2cx\right.}{}\right.\right.}{2c^2e\sqrt{b^2-4ac}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^(d + e*x)*x^2)/(a + b*x + c*x^2),x]
```

```
[Out] -1/2*(E^(d - ((b + Sqrt[b^2 - 4*a*c])*e)/(2*c))*(-2*c*Sqrt[b^2 - 4*a*c]*E^(
(e*(b + Sqrt[b^2 - 4*a*c] + 2*c*x))/(2*c)) + (-b^2 + 2*a*c + b*Sqrt[b^2 - 4
*a*c])*e*E^((Sqrt[b^2 - 4*a*c]*e)/c)*ExpIntegralEi[(e*(b - Sqrt[b^2 - 4*a*c
] + 2*c*x))/(2*c)] + (b^2 - 2*a*c + b*Sqrt[b^2 - 4*a*c])*e*ExpIntegralEi[(e
*(b + Sqrt[b^2 - 4*a*c] + 2*c*x))/(2*c)]))/(c^2*Sqrt[b^2 - 4*a*c]*e)
```

fricas [A] time = 0.41, size = 267, normalized size = 1.44

$$-\frac{\left(\left(b^{3}-4\,abc\right)e-\left(b^{2}c-2\,ac^{2}\right)\sqrt{\frac{\left(b^{2}-4\,ac\right)e^{2}}{c^{2}}}\right)\mathrm{Ei}\left(\frac{2\,cex+be-c\sqrt{\frac{\left(b^{2}-4\,ac\right)e^{2}}{c^{2}}}}{2\,c}\right)e^{\left(\frac{2\,cd-be+c\sqrt{\frac{\left(b^{2}-4\,ac\right)e^{2}}{c^{2}}}}{2\,c}\right)}+\left(\left(b^{3}-4\,abc\right)e+\left(b^{2}c-\right.\right.}{2\left(b^{2}c^{2}-4\,ac^{3}\right)e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*x+d)*x^2/(c*x^2+b*x+a),x, algorithm="fricas")
```

```
[Out] -1/2*(((b^3 - 4*a*b*c)*e - (b^2*c - 2*a*c^2)*sqrt((b^2 - 4*a*c)*e^2/c^2))*E
i(1/2*(2*c*e*x + b*e - c*sqrt((b^2 - 4*a*c)*e^2/c^2))/c)*e^(1/2*(2*c*d - b*
e + c*sqrt((b^2 - 4*a*c)*e^2/c^2))/c) + ((b^3 - 4*a*b*c)*e + (b^2*c - 2*a*c
^2)*sqrt((b^2 - 4*a*c)*e^2/c^2))*Ei(1/2*(2*c*e*x + b*e + c*sqrt((b^2 - 4*a*
c)*e^2/c^2))/c)*e^(1/2*(2*c*d - b*e - c*sqrt((b^2 - 4*a*c)*e^2/c^2))/c) - 2
*(b^2*c - 4*a*c^2)*e^(e*x + d))/((b^2*c^2 - 4*a*c^3)*e)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{2}e^{(ex+d)}}{cx^{2}+bx+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*x+d)*x^2/(c*x^2+b*x+a),x, algorithm="giac")
```

```
[Out] integrate(x^2*e^(e*x + d)/(c*x^2 + b*x + a), x)
```

maple [B] time = 0.04, size = 1730, normalized size = 9.30

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e*x+d)*x^2/(c*x^2+b*x+a),x)
```

```
[Out] 1/e^3*(e^2/c*exp(e*x+d)+1/2/c^2*e^2*(2*exp(1/2*(-b*e+2*c*d+(-4*a*c*e^2+b^2*
e^2)^(1/2))/c)*Ei(1,1/2*(-b*e+2*c*d-2*(e*x+d)*c+(-4*a*c*e^2+b^2*e^2)^(1/2))
/c)*a*c*e^2-exp(1/2*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,1/2*(-b
*e+2*c*d-2*(e*x+d)*c+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*b^2*e^2+2*exp(1/2*(-b*e
+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,1/2*(-b*e+2*c*d-2*(e*x+d)*c+(-4*
a*c*e^2+b^2*e^2)^(1/2))/c)*b*c*d*e-2*exp(1/2*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^
2)^(1/2))/c)*Ei(1,1/2*(-b*e+2*c*d-2*(e*x+d)*c+(-4*a*c*e^2+b^2*e^2)^(1/2))/c
)*c^2*d^2-2*exp(-1/2*(b*e-2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(b
```

```
*e-2*c*d+2*(e*x+d)*c+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*a*c*e^2+exp(-1/2*(b*e-2
*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+2*(e*x+d)*c+(-4*a*
c*e^2+b^2*e^2)^(1/2))/c)*b^2*e^2-2*exp(-1/2*(b*e-2*c*d+(-4*a*c*e^2+b^2*e^2)
^(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+2*(e*x+d)*c+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*
b*c*d*e+2*exp(-1/2*(b*e-2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(b*e
-2*c*d+2*(e*x+d)*c+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*c^2*d^2+exp(1/2*(-b*e+2*c
*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,1/2*(-b*e+2*c*d-2*(e*x+d)*c+(-4*a*c*
e^2+b^2*e^2)^(1/2))/c)*(-4*a*c*e^2+b^2*e^2)^(1/2)*b*e-2*exp(1/2*(-b*e+2*c*d
+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,1/2*(-b*e+2*c*d-2*(e*x+d)*c+(-4*a*c*e^
2+b^2*e^2)^(1/2))/c)*(-4*a*c*e^2+b^2*e^2)^(1/2)*c*d+exp(-1/2*(b*e-2*c*d+(-4
*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+2*(e*x+d)*c+(-4*a*c*e^2+b^
2*e^2)^(1/2))/c)*(-4*a*c*e^2+b^2*e^2)^(1/2)*b*e-2*exp(-1/2*(b*e-2*c*d+(-4*a
*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+2*(e*x+d)*c+(-4*a*c*e^2+b^2*
e^2)^(1/2))/c)*(-4*a*c*e^2+b^2*e^2)^(1/2)*c*d)/(-4*a*c*e^2+b^2*e^2)^(1/2)-d
^2*e^2*(exp(1/2*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,1/2*(-b*e+2
*c*d-2*(e*x+d)*c+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)-exp(-1/2*(b*e-2*c*d+(-4*a*c
*e^2+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+2*(e*x+d)*c+(-4*a*c*e^2+b^2*e^
2)^(1/2))/c))/(-4*a*c*e^2+b^2*e^2)^(1/2)+d*e^2*(-exp(1/2*(-b*e+2*c*d+(-4*a*
c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,1/2*(-b*e+2*c*d-2*(e*x+d)*c+(-4*a*c*e^2+b^2*e
^2)^(1/2))/c)*b*e+2*exp(1/2*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1
,1/2*(-b*e+2*c*d-2*(e*x+d)*c+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*c*d+exp(-1/2*(b
*e-2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+2*(e*x+d)*c+(-
4*a*c*e^2+b^2*e^2)^(1/2))/c)*b*e-2*exp(-1/2*(b*e-2*c*d+(-4*a*c*e^2+b^2*e^2)
^(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+2*(e*x+d)*c+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*
c*d+exp(1/2*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,1/2*(-b*e+2*c*d
-2*(e*x+d)*c+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*(-4*a*c*e^2+b^2*e^2)^(1/2)+exp(
-1/2*(b*e-2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+2*(e*x+
d)*c+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*(-4*a*c*e^2+b^2*e^2)^(1/2))/c/(-4*a*c*e
^2+b^2*e^2)^(1/2))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{x^2e^{(ex+d)}}{cex^2+bex+ae}-\int\frac{\left(bx^2e^d+2\,axe^d\right)e^{(ex)}}{c^2ex^4+2\,bcex^3+2\,abex+a^2e+\left(b^2e+2\,ace\right)x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*x+d)*x^2/(c*x^2+b*x+a),x, algorithm="maxima")
```

```
[Out] x^2*e^(e*x + d)/(c*e*x^2 + b*e*x + a*e) - integrate((b*x^2*e^d + 2*a*x*e^d)
*e^(e*x)/(c^2*e*x^4 + 2*b*c*e*x^3 + 2*a*b*e*x + a^2*e + (b^2*e + 2*a*c*e)*x
^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{x^2\,\mathrm{e}^{d+e\,x}}{c\,x^2+b\,x+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*exp(d + e*x))/(a + b*x + c*x^2),x)
```

```
[Out] int((x^2*exp(d + e*x))/(a + b*x + c*x^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$e^{d}\int \frac{x^{2}e^{ex}}{a+bx+cx^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*x+d)*x**2/(c*x**2+b*x+a),x)
```

```
[Out] exp(d)*Integral(x**2*exp(e*x)/(a + b*x + c*x**2), x)
```

3.472 $\int \frac{e^{d+ex}x^3}{a+bx+cx^2}\,dx$

Optimal. Leaf size=232

$$\frac{\left(-\frac{b\left(b^2-3ac\right)}{\sqrt{b^2-4ac}}-ac+b^2\right)e^{d-\frac{e\left(b-\sqrt{b^2-4ac}\right)}{2c}}\text{Ei}\left(\frac{e\left(b+2cx-\sqrt{b^2-4ac}\right)}{2c}\right)}{2c^3}+\frac{\left(\frac{b\left(b^2-3ac\right)}{\sqrt{b^2-4ac}}-ac+b^2\right)e^{d-\frac{e\left(\sqrt{b^2-4ac}+b\right)}{2c}}\text{Ei}\left(\frac{e\left(b+2cx+\sqrt{b^2-4ac}\right)}{2c}\right)}{2c^3}$$

```
[Out] -exp(e*x+d)/c/e^2-b*exp(e*x+d)/c^2/e+exp(e*x+d)*x/c/e+1/2*exp(d-1/2*e*(b-(-
4*a*c+b^2)^(1/2))/c)*Ei(1/2*e*(b+2*c*x-(-4*a*c+b^2)^(1/2))/c)*(b^2-a*c-b*(-
3*a*c+b^2)/(-4*a*c+b^2)^(1/2))/c^3+1/2*exp(d-1/2*e*(b+(-4*a*c+b^2)^(1/2))/c
)*Ei(1/2*e*(b+2*c*x+(-4*a*c+b^2)^(1/2))/c)*(b^2-a*c+b*(-3*a*c+b^2)/(-4*a*c+
b^2)^(1/2))/c^3
```

Rubi [A] time = 0.51, antiderivative size = 232, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {2270, 2194, 2176, 2178}

$$\frac{\left(-\frac{b\left(b^2-3ac\right)}{\sqrt{b^2-4ac}}-ac+b^2\right)e^{d-\frac{e\left(b-\sqrt{b^2-4ac}\right)}{2c}}\text{Ei}\left(\frac{e\left(b+2cx-\sqrt{b^2-4ac}\right)}{2c}\right)}{2c^3}+\frac{\left(\frac{b\left(b^2-3ac\right)}{\sqrt{b^2-4ac}}-ac+b^2\right)e^{d-\frac{e\left(\sqrt{b^2-4ac}+b\right)}{2c}}\text{Ei}\left(\frac{e\left(b+2cx+\sqrt{b^2-4ac}\right)}{2c}\right)}{2c^3}$$

Antiderivative was successfully verified.

```
[In] Int[(E^(d + e*x)*x^3)/(a + b*x + c*x^2),x]
```

```
[Out] -(E^(d + e*x)/(c*e^2)) - (b*E^(d + e*x))/(c^2*e) + (E^(d + e*x)*x)/(c*e) +
((b^2 - a*c - (b*(b^2 - 3*a*c))/Sqrt[b^2 - 4*a*c])*E^(d - ((b - Sqrt[b^2 -
4*a*c])*e)/(2*c))*ExpIntegralEi[(e*(b - Sqrt[b^2 - 4*a*c] + 2*c*x))/(2*c)])
/(2*c^3) + ((b^2 - a*c + (b*(b^2 - 3*a*c))/Sqrt[b^2 - 4*a*c])*E^(d - ((b +
Sqrt[b^2 - 4*a*c])*e)/(2*c))*ExpIntegralEi[(e*(b + Sqrt[b^2 - 4*a*c] + 2*c*
x))/(2*c)])/(2*c^3)
```

Rule 2176

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_.), x_Symbol] :> Simp[((c + d*x)^m*(b*F^(g*(e + f*x)))^n)/(f*g*n*Log[F]),
x] - Dist[(d*m)/(f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*(b*F^(g*(e + f*x)))^n
, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && GtQ[m, 0] && IntegerQ[2*m
] &&  !$UseGamma === True
```

Rule 2178

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - (c*f)/d))*ExpIntegralEi[(f*g*(c + d*x)*Log[F])/d])/d, x] /; F
```

```
reeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2194

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 2270

```
Int[((F_)^((g_.)*((d_.) + (e_.)*(x_))^(n_.))*(u_)^(m_.))/((a_.) + (b_.)*(x_
) + (c_)*(x_)^2), x_Symbol] :> Int[ExpandIntegrand[F^(g*(d + e*x)^n), u^m/(
a + b*x + c*x^2), x], x] /; FreeQ[{F, a, b, c, d, e, g, n}, x] && Polynomia
lQ[u, x] && IntegerQ[m]
```

Rubi steps

$$\int \frac{e^{d+ex}x^3}{a+bx+cx^2}\,dx = \int \left(-\frac{be^{d+ex}}{c^2}+\frac{e^{d+ex}x}{c}+\frac{e^{d+ex}\left(ab+\left(b^2-ac\right)x\right)}{c^2\left(a+bx+cx^2\right)}\right)dx$$

$$= \frac{\int \frac{e^{d+ex}\left(ab+\left(b^2-ac\right)x\right)}{a+bx+cx^2}\,dx}{c^2} - \frac{b\int e^{d+ex}\,dx}{c^2} + \frac{\int e^{d+ex}x\,dx}{c}$$

$$= -\frac{be^{d+ex}}{c^2e} + \frac{e^{d+ex}x}{ce} + \frac{\int \left(\frac{\left(b^2-ac+\frac{b\left(-b^2+3ac\right)}{\sqrt{b^2-4ac}}\right)e^{d+ex}}{b-\sqrt{b^2-4ac}+2cx} + \frac{\left(b^2-ac-\frac{b\left(-b^2+3ac\right)}{\sqrt{b^2-4ac}}\right)e^{d+ex}}{b+\sqrt{b^2-4ac}+2cx}\right)dx}{c^2} - \frac{\int e^{d+ex}\,dx}{ce}$$

$$= -\frac{e^{d+ex}}{ce^2} - \frac{be^{d+ex}}{c^2e} + \frac{e^{d+ex}x}{ce} + \frac{\left(b^2-ac-\frac{b\left(b^2-3ac\right)}{\sqrt{b^2-4ac}}\right)\int \frac{e^{d+ex}}{b-\sqrt{b^2-4ac}+2cx}\,dx}{c^2} + \frac{\left(b^2-ac+\frac{b\left(b^2-3ac\right)}{\sqrt{b^2-4ac}}\right)\cdots}{c^2}$$

$$= -\frac{e^{d+ex}}{ce^2} - \frac{be^{d+ex}}{c^2e} + \frac{e^{d+ex}x}{ce} + \frac{\left(b^2-ac-\frac{b\left(b^2-3ac\right)}{\sqrt{b^2-4ac}}\right)e^{d-\frac{\left(b-\sqrt{b^2-4ac}\right)e}{2c}}\text{Ei}\left(\frac{e\left(b-\sqrt{b^2-4ac}+2cx\right)}{2c}\right)}{2c^3} + \frac{\left(b^2-\cdots\right.}{\cdots}$$

Mathematica [A] time = 0.65, size = 268, normalized size = 1.16

$$\frac{e^{d-\frac{be}{c}}\left(-2c\sqrt{b^2-4ac}\,e^{e\left(\frac{b}{c}+x\right)}(be+c(-e)x+c)+e^2\left(b^2\sqrt{b^2-4ac}-ac\sqrt{b^2-4ac}+3abc-b^3\right)e^{\frac{e\left(\sqrt{b^2-4ac}+b\right)}{2c}}\text{Ei}\left(\frac{e\left(b+2c\cdots\right.}{\cdots}\right.\right.}{2c^3e^2\sqrt{b^2-4ac}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^(d + e*x)*x^3)/(a + b*x + c*x^2),x]
```

```
[Out] (E^(d - (b*e)/c)*(-2*c*Sqrt[b^2 - 4*a*c]*E^(e*(b/c + x))*(c + b*e - c*e*x)
+ (-b^3 + 3*a*b*c + b^2*Sqrt[b^2 - 4*a*c] - a*c*Sqrt[b^2 - 4*a*c])*e^2*E^((
(b + Sqrt[b^2 - 4*a*c])*e)/(2*c))*ExpIntegralEi[(e*(b - Sqrt[b^2 - 4*a*c] +
 2*c*x))/(2*c)] + (b^3 - 3*a*b*c + b^2*Sqrt[b^2 - 4*a*c] - a*c*Sqrt[b^2 - 4
*a*c])*e^2*E^(((b - Sqrt[b^2 - 4*a*c])*e)/(2*c))*ExpIntegralEi[(e*(b + Sqrt
[b^2 - 4*a*c] + 2*c*x))/(2*c)]))/(2*c^3*Sqrt[b^2 - 4*a*c]*e^2)
```

fricas [A] time = 0.43, size = 330, normalized size = 1.42

$$\frac{\left(\left(b^4 - 5\,ab^2c + 4\,a^2c^2\right)e^2 - \left(b^3c - 3\,abc^2\right)e\sqrt{\frac{\left(b^2-4\,ac\right)e^2}{c^2}}\right)\mathrm{Ei}\left(\frac{2\,cex+be-c\sqrt{\frac{\left(b^2-4\,ac\right)e^2}{c^2}}}{2\,c}\right)e^{\left(\frac{2\,cd-be+c\sqrt{\frac{\left(b^2-4\,ac\right)e^2}{c^2}}}{2\,c}\right)} + \left(\left(b^4 - 5\,ab\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*x+d)*x^3/(c*x^2+b*x+a),x, algorithm="fricas")
```

```
[Out] 1/2*(((b^4 - 5*a*b^2*c + 4*a^2*c^2)*e^2 - (b^3*c - 3*a*b*c^2)*e*sqrt((b^2 -
 4*a*c)*e^2/c^2))*Ei(1/2*(2*c*e*x + b*e - c*sqrt((b^2 - 4*a*c)*e^2/c^2))/c)
*e^(1/2*(2*c*d - b*e + c*sqrt((b^2 - 4*a*c)*e^2/c^2))/c) + ((b^4 - 5*a*b^2*
c + 4*a^2*c^2)*e^2 + (b^3*c - 3*a*b*c^2)*e*sqrt((b^2 - 4*a*c)*e^2/c^2))*Ei(
1/2*(2*c*e*x + b*e + c*sqrt((b^2 - 4*a*c)*e^2/c^2))/c)*e^(1/2*(2*c*d - b*e
- c*sqrt((b^2 - 4*a*c)*e^2/c^2))/c) - 2*(b^2*c^2 - 4*a*c^3 - (b^2*c^2 - 4*a
*c^3)*e*x + (b^3*c - 4*a*b*c^2)*e)*e^(e*x + d))/((b^2*c^3 - 4*a*c^4)*e^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3 e^{(ex+d)}}{cx^2 + bx + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*x+d)*x^3/(c*x^2+b*x+a),x, algorithm="giac")
```

```
[Out] integrate(x^3*e^(e*x + d)/(c*x^2 + b*x + a), x)
```

maple [B] time = 0.05, size = 3532, normalized size = 15.22

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(e*x+d)*x^3/(c*x^2+b*x+a),x)
```

```
[Out] 1/e^4*(-e^2*exp(e*x+d)*(-(e*x+d)*c+b*e-2*c*d+c)/c^2+1/2/c^3*e^2*(-3*exp(1/2
*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,1/2*(-b*e+2*c*d-2*(e*x+d)*
c+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*a*b*c*e^3+6*exp(1/2*(-b*e+2*c*d+(-4*a*c*e^
2+b^2*e^2)^(1/2))/c)*Ei(1,1/2*(-b*e+2*c*d-2*(e*x+d)*c+(-4*a*c*e^2+b^2*e^2)^
(1/2))/c)*a*c^2*d*e^2+exp(1/2*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei
(1,1/2*(-b*e+2*c*d-2*(e*x+d)*c+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*b^3*e^3-3*exp
(1/2*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,1/2*(-b*e+2*c*d-2*(e*x
+d)*c+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*b^2*c*d*e^2+3*exp(1/2*(-b*e+2*c*d+(-4*
a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,1/2*(-b*e+2*c*d-2*(e*x+d)*c+(-4*a*c*e^2+b^2
*e^2)^(1/2))/c)*b*c^2*d^2*e-2*exp(1/2*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2
))/c)*Ei(1,1/2*(-b*e+2*c*d-2*(e*x+d)*c+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*c^3*d
^3+3*exp(-1/2*(b*e-2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(b*e-2*c*
d+2*(e*x+d)*c+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*a*b*c*e^3-6*exp(-1/2*(b*e-2*c*
d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+2*(e*x+d)*c+(-4*a*c*e
^2+b^2*e^2)^(1/2))/c)*a*c^2*d*e^2-exp(-1/2*(b*e-2*c*d+(-4*a*c*e^2+b^2*e^2)^
(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+2*(e*x+d)*c+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*b
^3*e^3+3*exp(-1/2*(b*e-2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(b*e-
2*c*d+2*(e*x+d)*c+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*b^2*c*d*e^2-3*exp(-1/2*(b*
e-2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+2*(e*x+d)*c+(-4
*a*c*e^2+b^2*e^2)^(1/2))/c)*b*c^2*d^2*e+2*exp(-1/2*(b*e-2*c*d+(-4*a*c*e^2+b
^2*e^2)^(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+2*(e*x+d)*c+(-4*a*c*e^2+b^2*e^2)^(1/
2))/c)*c^3*d^3+exp(1/2*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,1/2*
(-b*e+2*c*d-2*(e*x+d)*c+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*(-4*a*c*e^2+b^2*e^2)
^(1/2)*a*c*e^2-exp(1/2*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,1/2*
(-b*e+2*c*d-2*(e*x+d)*c+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*(-4*a*c*e^2+b^2*e^2)
^(1/2)*b^2*e^2+3*exp(1/2*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,1/
2*(-b*e+2*c*d-2*(e*x+d)*c+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*(-4*a*c*e^2+b^2*e^
2)^(1/2)*b*c*d*e-3*exp(1/2*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,
1/2*(-b*e+2*c*d-2*(e*x+d)*c+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*(-4*a*c*e^2+b^2*
e^2)^(1/2)*c^2*d^2+exp(-1/2*(b*e-2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,
-1/2*(b*e-2*c*d+2*(e*x+d)*c+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*(-4*a*c*e^2+b^2*
e^2)^(1/2)*a*c*e^2-exp(-1/2*(b*e-2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,
-1/2*(b*e-2*c*d+2*(e*x+d)*c+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*(-4*a*c*e^2+b^2*
e^2)^(1/2)*b^2*e^2+3*exp(-1/2*(b*e-2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(
1,-1/2*(b*e-2*c*d+2*(e*x+d)*c+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*(-4*a*c*e^2+b^
2*e^2)^(1/2)*b*c*d*e-3*exp(-1/2*(b*e-2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*E
i(1,-1/2*(b*e-2*c*d+2*(e*x+d)*c+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*(-4*a*c*e^2+
b^2*e^2)^(1/2)*c^2*d^2)/(-4*a*c*e^2+b^2*e^2)^(1/2)+d^3*e^2*(exp(1/2*(-b*e+2
*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,1/2*(-b*e+2*c*d-2*(e*x+d)*c+(-4*a*
c*e^2+b^2*e^2)^(1/2))/c)-exp(-1/2*(b*e-2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)
*Ei(1,-1/2*(b*e-2*c*d+2*(e*x+d)*c+(-4*a*c*e^2+b^2*e^2)^(1/2))/c))/(-4*a*c*e
^2+b^2*e^2)^(1/2)-3/2*d^2*e^2*(-exp(1/2*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1
/2))/c)*Ei(1,1/2*(-b*e+2*c*d-2*(e*x+d)*c+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*b*e
+2*exp(1/2*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,1/2*(-b*e+2*c*d-
2*(e*x+d)*c+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*c*d+exp(-1/2*(b*e-2*c*d+(-4*a*c*
```

```
e^2+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+2*(e*x+d)*c+(-4*a*c*e^2+b^2*e^2
)^(1/2))/c)*b*e-2*exp(-1/2*(b*e-2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,-
1/2*(b*e-2*c*d+2*(e*x+d)*c+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*c*d+exp(1/2*(-b*e
+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,1/2*(-b*e+2*c*d-2*(e*x+d)*c+(-4*
a*c*e^2+b^2*e^2)^(1/2))/c)*(-4*a*c*e^2+b^2*e^2)^(1/2)+exp(-1/2*(b*e-2*c*d+(
-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+2*(e*x+d)*c+(-4*a*c*e^2+
b^2*e^2)^(1/2))/c)*(-4*a*c*e^2+b^2*e^2)^(1/2))/c/(-4*a*c*e^2+b^2*e^2)^(1/2)
-3*d*(1/c*e^2*exp(e*x+d)+1/2/c^2*e^2*(2*exp(1/2*(-b*e+2*c*d+(-4*a*c*e^2+b^2
*e^2)^(1/2))/c)*Ei(1,1/2*(-b*e+2*c*d-2*(e*x+d)*c+(-4*a*c*e^2+b^2*e^2)^(1/2)
)/c)*a*c*e^2-exp(1/2*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,1/2*(-
b*e+2*c*d-2*(e*x+d)*c+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*b^2*e^2+2*exp(1/2*(-b*
e+2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,1/2*(-b*e+2*c*d-2*(e*x+d)*c+(-4
*a*c*e^2+b^2*e^2)^(1/2))/c)*b*c*d*e-2*exp(1/2*(-b*e+2*c*d+(-4*a*c*e^2+b^2*e
^2)^(1/2))/c)*Ei(1,1/2*(-b*e+2*c*d-2*(e*x+d)*c+(-4*a*c*e^2+b^2*e^2)^(1/2))/
c)*c^2*d^2-2*exp(-1/2*(b*e-2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(
b*e-2*c*d+2*(e*x+d)*c+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*a*c*e^2+exp(-1/2*(b*e-
2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+2*(e*x+d)*c+(-4*a
*c*e^2+b^2*e^2)^(1/2))/c)*b^2*e^2-2*exp(-1/2*(b*e-2*c*d+(-4*a*c*e^2+b^2*e^2
)^(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+2*(e*x+d)*c+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)
*b*c*d*e+2*exp(-1/2*(b*e-2*c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(b*
e-2*c*d+2*(e*x+d)*c+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*c^2*d^2+exp(1/2*(-b*e+2*
c*d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,1/2*(-b*e+2*c*d-2*(e*x+d)*c+(-4*a*c
*e^2+b^2*e^2)^(1/2))/c)*(-4*a*c*e^2+b^2*e^2)^(1/2)*b*e-2*exp(1/2*(-b*e+2*c*
d+(-4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,1/2*(-b*e+2*c*d-2*(e*x+d)*c+(-4*a*c*e
^2+b^2*e^2)^(1/2))/c)*(-4*a*c*e^2+b^2*e^2)^(1/2)*c*d+exp(-1/2*(b*e-2*c*d+(-
4*a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+2*(e*x+d)*c+(-4*a*c*e^2+b
^2*e^2)^(1/2))/c)*(-4*a*c*e^2+b^2*e^2)^(1/2)*b*e-2*exp(-1/2*(b*e-2*c*d+(-4*
a*c*e^2+b^2*e^2)^(1/2))/c)*Ei(1,-1/2*(b*e-2*c*d+2*(e*x+d)*c+(-4*a*c*e^2+b^2
*e^2)^(1/2))/c)*(-4*a*c*e^2+b^2*e^2)^(1/2)*c*d)/(-4*a*c*e^2+b^2*e^2)^(1/2))
)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\left(cex^3e^d - cx^2e^d - bxe^d\right)e^{(ex)}}{c^2e^2x^2 + bce^2x + ace^2} - \int -\frac{\left(\left(bee^d + 2\,ce^d\right)ax + \left(b^2ee^d - 2\,acee^d\right)x^2 + abe^d\right)e^{(ex)}}{c^3e^2x^4 + 2\,bc^2e^2x^3 + 2\,abce^2x + a^2ce^2 + \left(b^2ce^2 + 2\,ac^2e^2\right)x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*x+d)*x^3/(c*x^2+b*x+a),x, algorithm="maxima")
```

```
[Out] (c*e*x^3*e^d - c*x^2*e^d - b*x*e^d)*e^(e*x)/(c^2*e^2*x^2 + b*c*e^2*x + a*c*
e^2) - integrate(-((b*e*e^d + 2*c*e^d)*a*x + (b^2*e*e^d - 2*a*c*e*e^d)*x^2
+ a*b*e^d)*e^(e*x)/(c^3*e^2*x^4 + 2*b*c^2*e^2*x^3 + 2*a*b*c*e^2*x + a^2*c*e
^2 + (b^2*c*e^2 + 2*a*c^2*e^2)*x^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^3\,\mathrm{e}^{d+e\,x}}{c\,x^2+b\,x+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*exp(d + e*x))/(a + b*x + c*x^2),x)
[Out] int((x^3*exp(d + e*x))/(a + b*x + c*x^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$e^d \int \frac{x^3 e^{ex}}{a+bx+cx^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(e*x+d)*x**3/(c*x**2+b*x+a),x)
[Out] exp(d)*Integral(x**3*exp(e*x)/(a + b*x + c*x**2), x)
```

3.473 $\int \frac{4^x}{a+2^x b} \, dx$

Optimal. Leaf size=30

$$\frac{2^x}{b\log(2)} - \frac{a\log\left(a + b2^x\right)}{b^2\log(2)}$$

```
[Out] 2^x/b/ln(2)-a*ln(a+2^x*b)/b^2/ln(2)
```

Rubi [A] time = 0.04, antiderivative size = 30, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2248, 43}

$$\frac{2^x}{b\log(2)} - \frac{a\log\left(a + b2^x\right)}{b^2\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[4^x/(a + 2^x*b),x]
```

```
[Out] 2^x/(b*Log[2]) - (a*Log[a + 2^x*b])/(b^2*Log[2])
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2248

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(g*h*Log[G])/(d*e*Lo
g[F])]}, Dist[(Denominator[m]*G^(f*h - (c*g*h)/d))/(d*e*Log[F]), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^((e*(c + d*x))/De
nominator[m])], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int \frac{4^x}{a+2^x b}\,dx = \frac{\text{Subst}\left(\int \frac{x}{a+bx}\,dx, x, 2^x\right)}{\log(2)}$$
$$= \frac{\text{Subst}\left(\int \left(\frac{1}{b} - \frac{a}{b(a+bx)}\right)\,dx, x, 2^x\right)}{\log(2)}$$
$$= \frac{2^x}{b\log(2)} - \frac{a\log\left(a+2^x b\right)}{b^2\log(2)}$$

Mathematica [A]   time = 0.02, size = 27, normalized size = 0.90

$$\frac{\frac{2^x}{b} - \frac{a\log(a+b2^x)}{b^2}}{\log(2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[4^x/(a + 2^x*b),x]
[Out] (2^x/b - (a*Log[a + 2^x*b])/b^2)/Log[2]
```

fricas [A]   time = 0.41, size = 25, normalized size = 0.83

$$\frac{2^x b - a\log\left(2^x b + a\right)}{b^2\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4^x/(a+2^x*b),x, algorithm="fricas")
[Out] (2^x*b - a*log(2^x*b + a))/(b^2*log(2))
```

giac [F]   time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{4^x}{2^x b + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4^x/(a+2^x*b),x, algorithm="giac")
[Out] integrate(4^x/(2^x*b + a), x)
```

maple [A]   time = 0.03, size = 35, normalized size = 1.17

$$-\frac{a\ln\left(b\,\mathrm{e}^{\ln(2)x} + a\right)}{\ln(2)b^2} + \frac{\mathrm{e}^{\ln(2)x}}{\ln(2)b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(4^x/(a+2^x*b),x)
```

```
[Out] 1/ln(2)/b*exp(x*ln(2))-1/ln(2)/b^2*a*ln(a+exp(x*ln(2))*b)
```

maxima [A] time = 1.86, size = 30, normalized size = 1.00

$$\frac{2^x}{b\log(2)} - \frac{a\log(2^x b + a)}{b^2\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4^x/(a+2^x*b),x, algorithm="maxima")
```

```
[Out] 2^x/(b*log(2)) - a*log(2^x*b + a)/(b^2*log(2))
```

mupad [B] time = 3.60, size = 26, normalized size = 0.87

$$-\frac{a\ \ln(a + 2^x\ b) - 2^x\ b}{b^2\ \ln(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(4^x/(a + 2^x*b),x)
```

```
[Out] -(a*log(a + 2^x*b) - 2^x*b)/(b^2*log(2))
```

sympy [A] time = 0.29, size = 41, normalized size = 1.37

$$-\frac{a\log\left(\frac{a}{b} + e^{\frac{x\log(4)}{2}}\right)}{b^2\log(2)} + \begin{cases} \frac{e^{\frac{x\log(4)}{2}}}{b\log(2)} & \text{for } b\log(2) \neq 0 \\ \frac{x}{b} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4**x/(a+2**x*b),x)
```

```
[Out] -a*log(a/b + exp(x*log(4)/2))/(b**2*log(2)) + Piecewise((exp(x*log(4)/2)/(b
*log(2)), Ne(b*log(2), 0)), (x/b, True))
```

3.474 $\int \frac{2^{2x}}{a+2^x b} \, dx$

Optimal. Leaf size=30

$$\frac{2^x}{b\log(2)} - \frac{a\log\left(a+b2^x\right)}{b^2\log(2)}$$

[Out] 2^x/b/ln(2)-a*ln(a+2^x*b)/b^2/ln(2)

Rubi [A] time = 0.03, antiderivative size = 30, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {2248, 43}

$$\frac{2^x}{b\log(2)} - \frac{a\log\left(a+b2^x\right)}{b^2\log(2)}$$

Antiderivative was successfully verified.

[In] Int[2^(2*x)/(a + 2^x*b),x]

[Out] 2^x/(b*Log[2]) - (a*Log[a + 2^x*b])/(b^2*Log[2])

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2248

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(g*h*Log[G])/(d*e*Lo
g[F])]}, Dist[(Denominator[m]*G^(f*h - (c*g*h)/d))/(d*e*Log[F]), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^((e*(c + d*x))/De
nominator[m])], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int \frac{2^{2x}}{a+2^x b}\,dx = \frac{\text{Subst}\left(\int \frac{x}{a+bx}\,dx, x, 2^x\right)}{\log(2)}$$
$$= \frac{\text{Subst}\left(\int \left(\frac{1}{b} - \frac{a}{b(a+bx)}\right) dx, x, 2^x\right)}{\log(2)}$$
$$= \frac{2^x}{b\log(2)} - \frac{a\log\left(a+2^x b\right)}{b^2\log(2)}$$

Mathematica [A] time = 0.01, size = 27, normalized size = 0.90

$$\frac{\frac{2^x}{b} - \frac{a\log(a+b2^x)}{b^2}}{\log(2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^(2*x)/(a + 2^x*b),x]
```

```
[Out] (2^x/b - (a*Log[a + 2^x*b])/b^2)/Log[2]
```

fricas [A] time = 0.43, size = 25, normalized size = 0.83

$$\frac{2^x b - a\log\left(2^x b + a\right)}{b^2\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(2*x)/(a+2^x*b),x, algorithm="fricas")
```

```
[Out] (2^x*b - a*log(2^x*b + a))/(b^2*log(2))
```

giac [A] time = 0.30, size = 31, normalized size = 1.03

$$\frac{2^x}{b\log(2)} - \frac{a\log\left(|2^x b + a|\right)}{b^2\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(2*x)/(a+2^x*b),x, algorithm="giac")
```

```
[Out] 2^x/(b*log(2)) - a*log(abs(2^x*b + a))/(b^2*log(2))
```

maple [A] time = 0.02, size = 35, normalized size = 1.17

$$-\frac{a\ln\left(b\,e^{\ln(2)x} + a\right)}{\ln(2)b^2} + \frac{e^{\ln(2)x}}{\ln(2)b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^(2*x)/(a+2^x*b),x)
```

```
[Out] -1/ln(2)*a/b^2*ln(b*exp(ln(2)*x)+a)+1/ln(2)/b*exp(ln(2)*x)
```

maxima [A] time = 0.86, size = 30, normalized size = 1.00

$$\frac{2^x}{b\log(2)} - \frac{a\log\left(2^x b + a\right)}{b^2\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(2*x)/(a+2^x*b),x, algorithm="maxima")
```

```
[Out] 2^x/(b*log(2)) - a*log(2^x*b + a)/(b^2*log(2))
```

mupad [B] time = 3.61, size = 26, normalized size = 0.87

$$-\frac{a\,\ln\left(a+2^x\,b\right)-2^x\,b}{b^2\,\ln(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^(2*x)/(a + 2^x*b),x)
```

```
[Out] -(a*log(a + 2^x*b) - 2^x*b)/(b^2*log(2))
```

sympy [A] time = 0.16, size = 31, normalized size = 1.03

$$-\frac{a\log\left(2^x+\frac{a}{b}\right)}{b^2\log\left(2\right)} + \begin{cases} \frac{2^x}{b\log\left(2\right)} & \text{for}\: b\log\left(2\right) \neq 0 \\ \frac{x}{b} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**(2*x)/(a+2**x*b),x)
```

```
[Out] -a*log(2**x + a/b)/(b**2*log(2)) + Piecewise((2**x/(b*log(2)), Ne(b*log(2),
 0)), (x/b, True))
```

3.475 $\int \frac{4^x}{a-2^x b} \, dx$

Optimal. Leaf size=32

$$-\frac{a\log\left(a-b2^x\right)}{b^2\log(2)}-\frac{2^x}{b\log(2)}$$

```
[Out] -2^x/b/ln(2)-a*ln(a-2^x*b)/b^2/ln(2)
```

Rubi [A] time = 0.04, antiderivative size = 32, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2248, 43}

$$-\frac{a\log\left(a-b2^x\right)}{b^2\log(2)}-\frac{2^x}{b\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[4^x/(a - 2^x*b),x]
```

```
[Out] -(2^x/(b*Log[2])) - (a*Log[a - 2^x*b])/(b^2*Log[2])
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2248

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(g*h*Log[G])/(d*e*Lo
g[F])]}, Dist[(Denominator[m]*G^(f*h - (c*g*h)/d))/(d*e*Log[F]), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^((e*(c + d*x))/De
nominator[m])], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int \frac{4^x}{a-2^x b}\,dx = \frac{\text{Subst}\left(\int \frac{x}{a-bx}\,dx, x, 2^x\right)}{\log(2)}$$
$$= \frac{\text{Subst}\left(\int \left(-\frac{1}{b}-\frac{a}{b(-a+bx)}\right)dx, x, 2^x\right)}{\log(2)}$$
$$= -\frac{2^x}{b\log(2)} - \frac{a\log\left(a-2^x b\right)}{b^2\log(2)}$$

Mathematica [A] time = 0.02, size = 26, normalized size = 0.81

$$-\frac{a\log\left(a-b2^x\right)+b2^x}{b^2\log(2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[4^x/(a - 2^x*b),x]
[Out] -((2^x*b + a*Log[a - 2^x*b])/(b^2*Log[2]))
```

fricas [A] time = 0.43, size = 27, normalized size = 0.84

$$-\frac{2^x b + a\log\left(2^x b - a\right)}{b^2\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4^x/(a-2^x*b),x, algorithm="fricas")
[Out] -(2^x*b + a*log(2^x*b - a))/(b^2*log(2))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int -\frac{4^x}{2^x b - a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4^x/(a-2^x*b),x, algorithm="giac")
[Out] integrate(-4^x/(2^x*b - a), x)
```

maple [A] time = 0.03, size = 37, normalized size = 1.16

$$-\frac{a\ln\left(-b\,\mathrm{e}^{\ln(2)x}+a\right)}{\ln(2)b^2} - \frac{\mathrm{e}^{\ln(2)x}}{\ln(2)b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(4^x/(a-2^x*b),x)
```

```
[Out] -1/ln(2)/b*exp(ln(2)*x)-1/ln(2)/b^2*a*ln(a-b*exp(ln(2)*x))
```

maxima [A] time = 1.66, size = 33, normalized size = 1.03

$$-\frac{2^x}{b\log(2)}-\frac{a\log\left(2^x b-a\right)}{b^2\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4^x/(a-2^x*b),x, algorithm="maxima")
```

```
[Out] -2^x/(b*log(2)) - a*log(2^x*b - a)/(b^2*log(2))
```

mupad [B] time = 3.61, size = 27, normalized size = 0.84

$$-\frac{2^x\,b+a\,\ln\left(2^x\,b-a\right)}{b^2\,\ln(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(4^x/(a - 2^x*b),x)
```

```
[Out] -(2^x*b + a*log(2^x*b - a))/(b^2*log(2))
```

sympy [A] time = 0.30, size = 44, normalized size = 1.38

$$-\frac{a\log\left(-\frac{a}{b}+e^{\frac{x\log(4)}{2}}\right)}{b^2\log(2)}+\begin{cases}-\frac{e^{\frac{x\log(4)}{2}}}{b\log(2)} & \text{for}\ b\log(2)\neq 0\\ -\frac{x}{b} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4**x/(a-2**x*b),x)
```

```
[Out] -a*log(-a/b + exp(x*log(4)/2))/(b**2*log(2)) + Piecewise((-exp(x*log(4)/2)/
(b*log(2)), Ne(b*log(2), 0)), (-x/b, True))
```

3.476 $\int \frac{2^{2x}}{a-2^x b}\,dx$

Optimal. Leaf size=32

$$-\frac{a\log\left(a-b2^x\right)}{b^2\log(2)}-\frac{2^x}{b\log(2)}$$

```
[Out] -2^x/b/ln(2)-a*ln(a-2^x*b)/b^2/ln(2)
```

Rubi [A] time = 0.04, antiderivative size = 32, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {2248, 43}

$$-\frac{a\log\left(a-b2^x\right)}{b^2\log(2)}-\frac{2^x}{b\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[2^(2*x)/(a - 2^x*b),x]
```

```
[Out] -(2^x/(b*Log[2])) - (a*Log[a - 2^x*b])/(b^2*Log[2])
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2248

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(g*h*Log[G])/(d*e*Lo
g[F])]}, Dist[(Denominator[m]*G^(f*h - (c*g*h)/d))/(d*e*Log[F]), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^((e*(c + d*x))/De
nominator[m])], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int \frac{2^{2x}}{a-2^x b}\,dx = \frac{\text{Subst}\left(\int \frac{x}{a-bx}\,dx, x, 2^x\right)}{\log(2)}$$
$$= \frac{\text{Subst}\left(\int \left(-\frac{1}{b}-\frac{a}{b(-a+bx)}\right)dx, x, 2^x\right)}{\log(2)}$$
$$= -\frac{2^x}{b\log(2)} - \frac{a\log(a-2^x b)}{b^2\log(2)}$$

Mathematica [A] time = 0.01, size = 26, normalized size = 0.81

$$-\frac{a\log(a-b2^x)+b2^x}{b^2\log(2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^(2*x)/(a - 2^x*b),x]
[Out] -((2^x*b + a*Log[a - 2^x*b])/(b^2*Log[2]))
```

fricas [A] time = 0.42, size = 27, normalized size = 0.84

$$-\frac{2^x b + a\log(2^x b - a)}{b^2\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(2*x)/(a-2^x*b),x, algorithm="fricas")
[Out] -(2^x*b + a*log(2^x*b - a))/(b^2*log(2))
```

giac [A] time = 0.40, size = 34, normalized size = 1.06

$$-\frac{2^x}{b\log(2)} - \frac{a\log(|2^x b - a|)}{b^2\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(2*x)/(a-2^x*b),x, algorithm="giac")
[Out] -2^x/(b*log(2)) - a*log(abs(2^x*b - a))/(b^2*log(2))
```

maple [A] time = 0.02, size = 37, normalized size = 1.16

$$-\frac{a\ln\left(-b\,e^{\ln(2)x}+a\right)}{\ln(2)b^2} - \frac{e^{\ln(2)x}}{\ln(2)b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^(2*x)/(a-2^x*b),x)
```

```
[Out] -1/ln(2)*a/b^2*ln(-b*exp(ln(2)*x)+a)-1/ln(2)/b*exp(ln(2)*x)
```

maxima [A] time = 0.78, size = 33, normalized size = 1.03

$$-\frac{2^x}{b\log(2)}-\frac{a\log(2^xb-a)}{b^2\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(2*x)/(a-2^x*b),x, algorithm="maxima")
```

```
[Out] -2^x/(b*log(2)) - a*log(2^x*b - a)/(b^2*log(2))
```

mupad [B] time = 3.58, size = 27, normalized size = 0.84

$$-\frac{2^x\,b+a\,\ln(2^x\,b-a)}{b^2\,\ln(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^(2*x)/(a - 2^x*b),x)
```

```
[Out] -(2^x*b + a*log(2^x*b - a))/(b^2*log(2))
```

sympy [A] time = 0.17, size = 34, normalized size = 1.06

$$-\frac{a\log\left(2^x-\frac{a}{b}\right)}{b^2\log(2)}+\begin{cases}-\frac{2^x}{b\log(2)} & \text{for}\ b\log(2)\neq 0\\ -\frac{x}{b} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**(2*x)/(a-2**x*b),x)
```

```
[Out] -a*log(2**x - a/b)/(b**2*log(2)) + Piecewise((-2**x/(b*log(2)), Ne(b*log(2)
, 0)), (-x/b, True))
```

3.477 $\int \frac{4^x}{a+2^{-x}b}\,dx$

Optimal. Leaf size=58

$$\frac{b^2x}{a^3}+\frac{b^2\log(a+b2^{-x})}{a^3\log(2)}-\frac{b2^x}{a^2\log(2)}+\frac{2^{2x-1}}{a\log(2)}$$

```
[Out] b^2*x/a^3+2^(-1+2*x)/a/ln(2)-2^x*b/a^2/ln(2)+b^2*ln(a+b/(2^x))/a^3/ln(2)
```

Rubi [A] time = 0.06, antiderivative size = 58, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {2248, 44}

$$\frac{b^2x}{a^3}+\frac{b^2\log(a+b2^{-x})}{a^3\log(2)}-\frac{b2^x}{a^2\log(2)}+\frac{2^{2x-1}}{a\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[4^x/(a + b/2^x),x]
```

```
[Out] (b^2*x)/a^3 + 2^(-1 + 2*x)/(a*Log[2]) - (2^x*b)/(a^2*Log[2]) + (b^2*Log[a +
 b/2^x])/(a^3*Log[2])
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2248

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(g*h*Log[G])/(d*e*Lo
g[F])]}, Dist[(Denominator[m]*G^(f*h - (c*g*h)/d))/(d*e*Log[F]), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^((e*(c + d*x))/De
nominator[m])], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int \frac{4^x}{a+2^{-x}b}\,dx = -\frac{\text{Subst}\left(\int \frac{1}{x^3(a+bx)}\,dx,x,2^{-x}\right)}{\log(2)}$$
$$= -\frac{\text{Subst}\left(\int \left(\frac{1}{ax^3}-\frac{b}{a^2x^2}+\frac{b^2}{a^3x}-\frac{b^3}{a^3(a+bx)}\right)dx,x,2^{-x}\right)}{\log(2)}$$
$$= \frac{b^2x}{a^3}+\frac{2^{-1+2x}}{a\log(2)}-\frac{2^xb}{a^2\log(2)}+\frac{b^2\log(a+2^{-x}b)}{a^3\log(2)}$$

Mathematica [**A**] time = 0.03, size = 36, normalized size = 0.62

$$\frac{2b^2\log(a2^x+b)+a2^x(a2^x-2b)}{a^3\log(4)}$$

Antiderivative was successfully verified.

```
[In] Integrate[4^x/(a + b/2^x),x]
[Out] (2^x*a*(2^x*a - 2*b) + 2*b^2*Log[2^x*a + b])/(a^3*Log[4])
```

fricas [**A**] time = 0.42, size = 39, normalized size = 0.67

$$\frac{2^{2x}a^2-2\cdot 2^xab+2\,b^2\log(2^xa+b)}{2\,a^3\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4^x/(a+b/(2^x)),x, algorithm="fricas")
[Out] 1/2*(2^(2*x)*a^2 - 2*2^x*a*b + 2*b^2*log(2^x*a + b))/(a^3*log(2))
```

giac [**F**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{4^x}{a+\frac{b}{2^x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4^x/(a+b/(2^x)),x, algorithm="giac")
[Out] integrate(4^x/(a + b/2^x), x)
```

maple [A] time = 0.03, size = 54, normalized size = 0.93

$$\frac{e^{2\ln(2)x}}{2\ln(2)a} - \frac{b\,e^{\ln(2)x}}{\ln(2)a^2} + \frac{b^2\ln\left(a\,e^{\ln(2)x} + b\right)}{\ln(2)a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(4^x/(a+b/(2^x)),x)
```

```
[Out] 1/2/a/ln(2)*exp(ln(2)*x)^2-1/a^2/ln(2)*b*exp(ln(2)*x)+1/a^3/ln(2)*b^2*ln(a*
exp(ln(2)*x)+b)
```

maxima [A] time = 2.10, size = 59, normalized size = 1.02

$$\frac{b^2x}{a^3} - \frac{\left(2^{-x+1}b - a\right)2^{2x-1}}{a^2\log(2)} + \frac{b^2\log\left(a + \frac{b}{2^x}\right)}{a^3\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4^x/(a+b/(2^x)),x, algorithm="maxima")
```

```
[Out] b^2*x/a^3 - (2^(-x + 1)*b - a)*2^(2*x - 1)/(a^2*log(2)) + b^2*log(a + b/2^x
)/(a^3*log(2))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{4^x}{a + \frac{b}{2^x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(4^x/(a + b/2^x),x)
```

```
[Out] int(4^x/(a + b/2^x), x)
```

sympy [A] time = 0.37, size = 92, normalized size = 1.59

$$\begin{cases} \frac{2^{2x}a^2\log(2) - 2\cdot 2^x ab\log(2)}{2a^3\log(2)^2} & \text{for}\ 2a^3\log(2)^2 \neq 0 \\ x\left(-\frac{b^2}{a^3} + \frac{a^2 - ab + b^2}{a^3}\right) & \text{otherwise} \end{cases} + \frac{b^2x}{a^3} + \frac{b^2\log\left(\frac{a}{b} + 2^{-x}\right)}{a^3\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4**x/(a+b/(2**x)),x)
```

```
[Out] Piecewise(((2**(2*x)*a**2*log(2) - 2*2**x*a*b*log(2))/(2*a**3*log(2)**2), N
e(2*a**3*log(2)**2, 0)), (x*(-b**2/a**3 + (a**2 - a*b + b**2)/a**3), True))
 + b**2*x/a**3 + b**2*log(a/b + 2**(-x))/(a**3*log(2))
```

3.478 $\int \frac{2^{2x}}{a+2^{-x}b} \, dx$

Optimal. Leaf size=58

$$\frac{b^2 x}{a^3} + \frac{b^2 \log \left(a + b2^{-x}\right)}{a^3 \log(2)} - \frac{b2^x}{a^2 \log(2)} + \frac{2^{2x-1}}{a \log(2)}$$

```
[Out] b^2*x/a^3+2^(-1+2*x)/a/ln(2)-2^x*b/a^2/ln(2)+b^2*ln(a+b/(2^x))/a^3/ln(2)
```

Rubi [A] time = 0.05, antiderivative size = 58, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118, Rules used = {2248, 44}

$$\frac{b^2 x}{a^3} + \frac{b^2 \log \left(a + b2^{-x}\right)}{a^3 \log(2)} - \frac{b2^x}{a^2 \log(2)} + \frac{2^{2x-1}}{a \log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[2^(2*x)/(a + b/2^x),x]
```

```
[Out] (b^2*x)/a^3 + 2^(-1 + 2*x)/(a*Log[2]) - (2^x*b)/(a^2*Log[2]) + (b^2*Log[a +
 b/2^x])/(a^3*Log[2])
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2248

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(g*h*Log[G])/(d*e*Lo
g[F])]}, Dist[(Denominator[m]*G^(f*h - (c*g*h)/d))/(d*e*Log[F]), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^((e*(c + d*x))/De
nominator[m])], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int \frac{2^{2x}}{a+2^{-x}b}\,dx = -\frac{\text{Subst}\left(\int \frac{1}{x^3(a+bx)}\,dx, x, 2^{-x}\right)}{\log(2)}$$
$$= -\frac{\text{Subst}\left(\int \left(\frac{1}{ax^3}-\frac{b}{a^2x^2}+\frac{b^2}{a^3x}-\frac{b^3}{a^3(a+bx)}\right)dx, x, 2^{-x}\right)}{\log(2)}$$
$$= \frac{b^2x}{a^3}+\frac{2^{-1+2x}}{a\log(2)}-\frac{2^x b}{a^2\log(2)}+\frac{b^2\log\left(a+2^{-x}b\right)}{a^3\log(2)}$$

Mathematica [**A**] time = 0.02, size = 36, normalized size = 0.62

$$\frac{2b^2\log\left(a2^x+b\right)+a2^x\left(a2^x-2b\right)}{a^3\log(4)}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^(2*x)/(a + b/2^x),x]
[Out] (2^x*a*(2^x*a - 2*b) + 2*b^2*Log[2^x*a + b])/(a^3*Log[4])
```

fricas [**A**] time = 0.41, size = 39, normalized size = 0.67

$$\frac{2^{2x}a^2-2\cdot 2^x ab+2\,b^2\log\left(2^x a+b\right)}{2\,a^3\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(2*x)/(a+b/(2^x)),x, algorithm="fricas")
[Out] 1/2*(2^(2*x)*a^2 - 2*2^x*a*b + 2*b^2*log(2^x*a + b))/(a^3*log(2))
```

giac [**A**] time = 0.39, size = 48, normalized size = 0.83

$$\frac{b^2\log\left(|2^x a+b|\right)}{a^3\log(2)}+\frac{2^{2x}a\log(2)-2\cdot 2^x b\log(2)}{2\,a^2\log(2)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(2*x)/(a+b/(2^x)),x, algorithm="giac")
[Out] b^2*log(abs(2^x*a + b))/(a^3*log(2)) + 1/2*(2^(2*x)*a*log(2) - 2*2^x*b*log(
2))/(a^2*log(2)^2)
```

maple [A] time = 0.03, size = 54, normalized size = 0.93

$$\frac{e^{2\ln(2)x}}{2\ln(2)a} - \frac{b\,e^{\ln(2)x}}{\ln(2)a^2} + \frac{b^2\ln\left(a\,e^{\ln(2)x} + b\right)}{\ln(2)a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^(2*x)/(a+b/(2^x)),x)
```

```
[Out] 1/2/a/ln(2)*exp(ln(2)*x)^2-1/ln(2)/a^2*b*exp(ln(2)*x)+1/ln(2)/a^3*b^2*ln(a*
exp(ln(2)*x)+b)
```

maxima [A] time = 0.79, size = 59, normalized size = 1.02

$$\frac{b^2x}{a^3} - \frac{\left(2^{-x+1}b - a\right)2^{2x-1}}{a^2\log(2)} + \frac{b^2\log\left(a + \frac{b}{2^x}\right)}{a^3\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(2*x)/(a+b/(2^x)),x, algorithm="maxima")
```

```
[Out] b^2*x/a^3 - (2^(-x + 1)*b - a)*2^(2*x - 1)/(a^2*log(2)) + b^2*log(a + b/2^x
)/(a^3*log(2))
```

mupad [B] time = 3.68, size = 47, normalized size = 0.81

$$\frac{2^{2x}}{2\,a\,\ln(2)} - \frac{2^x\,b}{a^2\,\ln(2)} + \frac{b^2\,\ln\left(b + 2^x\,a\right)}{a^3\,\ln(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^(2*x)/(a + b/2^x),x)
```

```
[Out] 2^(2*x)/(2*a*log(2)) - (2^x*b)/(a^2*log(2)) + (b^2*log(b + 2^x*a))/(a^3*log
(2))
```

sympy [A] time = 0.22, size = 92, normalized size = 1.59

$$\begin{cases} \frac{2^{2x}a^2\log(2) - 2\cdot 2^x ab\log(2)}{2a^3\log(2)^2} & \text{for } 2a^3\log(2)^2 \neq 0 \\ x\left(-\frac{b^2}{a^3} + \frac{a^2 - ab + b^2}{a^3}\right) & \text{otherwise} \end{cases} + \frac{b^2x}{a^3} + \frac{b^2\log\left(\frac{a}{b} + 2^{-x}\right)}{a^3\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**(2*x)/(a+b/(2**x)),x)
```

```
[Out] Piecewise((((2**(2*x)*a**2*log(2) - 2*2**x*a*b*log(2))/(2*a**3*log(2)**2), N
e(2*a**3*log(2)**2, 0)), (x*(-b**2/a**3 + (a**2 - a*b + b**2)/a**3), True))
 + b**2*x/a**3 + b**2*log(a/b + 2**(-x))/(a**3*log(2))
```

3.479 $\int \frac{4^x}{a-2^{-x}b}\,dx$

Optimal. Leaf size=58

$$\frac{b^2x}{a^3}+\frac{b^2\log\left(a-b2^{-x}\right)}{a^3\log(2)}+\frac{b2^x}{a^2\log(2)}+\frac{2^{2x-1}}{a\log(2)}$$

```
[Out] b^2*x/a^3+2^(-1+2*x)/a/ln(2)+2^x*b/a^2/ln(2)+b^2*ln(a-b/(2^x))/a^3/ln(2)
```

Rubi [A] time = 0.05, antiderivative size = 58, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {2248, 44}

$$\frac{b^2x}{a^3}+\frac{b^2\log\left(a-b2^{-x}\right)}{a^3\log(2)}+\frac{b2^x}{a^2\log(2)}+\frac{2^{2x-1}}{a\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[4^x/(a - b/2^x),x]
```

```
[Out] (b^2*x)/a^3 + 2^(-1 + 2*x)/(a*Log[2]) + (2^x*b)/(a^2*Log[2]) + (b^2*Log[a -
 b/2^x])/(a^3*Log[2])
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2248

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(g*h*Log[G])/(d*e*Lo
g[F])]}, Dist[(Denominator[m]*G^(f*h - (c*g*h)/d))/(d*e*Log[F]), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^((e*(c + d*x))/De
nominator[m])], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int \frac{4^x}{a-2^{-x}b}\,dx = -\frac{\text{Subst}\left(\int \frac{1}{x^3(a-bx)}\,dx, x, 2^{-x}\right)}{\log(2)}$$
$$= -\frac{\text{Subst}\left(\int \left(\frac{1}{ax^3}+\frac{b}{a^2x^2}+\frac{b^2}{a^3x}+\frac{b^3}{a^3(a-bx)}\right)dx, x, 2^{-x}\right)}{\log(2)}$$
$$= \frac{b^2x}{a^3}+\frac{2^{-1+2x}}{a\log(2)}+\frac{2^xb}{a^2\log(2)}+\frac{b^2\log(a-2^{-x}b)}{a^3\log(2)}$$

Mathematica [A] time = 0.03, size = 38, normalized size = 0.66

$$\frac{2b^2\log(a2^x-b)+a2^x(a2^x+2b)}{a^3\log(4)}$$

Antiderivative was successfully verified.

```
[In] Integrate[4^x/(a - b/2^x),x]
[Out] (2^x*a*(2^x*a + 2*b) + 2*b^2*Log[2^x*a - b])/(a^3*Log[4])
```

fricas [A] time = 0.41, size = 41, normalized size = 0.71

$$\frac{2^{2x}a^2+2\cdot 2^xab+2b^2\log(2^xa-b)}{2a^3\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4^x/(a-b/(2^x)),x, algorithm="fricas")
[Out] 1/2*(2^(2*x)*a^2 + 2*2^x*a*b + 2*b^2*log(2^x*a - b))/(a^3*log(2))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{4^x}{a-\frac{b}{2^x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4^x/(a-b/(2^x)),x, algorithm="giac")
[Out] integrate(4^x/(a - b/2^x), x)
```

maple [A] time = 0.02, size = 55, normalized size = 0.95

$$\frac{e^{2\ln(2)x}}{2\ln(2)a}+\frac{b\,e^{\ln(2)x}}{\ln(2)a^2}+\frac{b^2\ln\left(a\,e^{\ln(2)x}-b\right)}{\ln(2)a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(4^x/(a-b/(2^x)),x)
```

```
[Out] 1/ln(2)/a^2*b*exp(ln(2)*x)+1/2/a/ln(2)*exp(ln(2)*x)^2+1/a^3/ln(2)*b^2*ln(a*
exp(ln(2)*x)-b)
```

maxima [A] time = 1.94, size = 58, normalized size = 1.00

$$\frac{b^2x}{a^3}+\frac{\left(2^{-x+1}b+a\right)2^{2x-1}}{a^2\log(2)}+\frac{b^2\log\left(-a+\frac{b}{2^x}\right)}{a^3\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4^x/(a-b/(2^x)),x, algorithm="maxima")
```

```
[Out] b^2*x/a^3 + (2^(-x + 1)*b + a)*2^(2*x - 1)/(a^2*log(2)) + b^2*log(-a + b/2^
x)/(a^3*log(2))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int\frac{4^x}{a-\frac{b}{2^x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(4^x/(a - b/2^x),x)
```

```
[Out] int(4^x/(a - b/2^x), x)
```

sympy [A] time = 0.37, size = 92, normalized size = 1.59

$$\begin{cases}\frac{2^{2x}a^2\log(2)+2\cdot2^xab\log(2)}{2a^3\log(2)^2} & \text{for } 2a^3\log(2)^2\neq0\\ x\left(-\frac{b^2}{a^3}+\frac{a^2+ab+b^2}{a^3}\right) & \text{otherwise}\end{cases}+\frac{b^2x}{a^3}+\frac{b^2\log\left(-\frac{a}{b}+2^{-x}\right)}{a^3\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4**x/(a-b/(2**x)),x)
```

```
[Out] Piecewise(((2**(2*x)*a**2*log(2) + 2*2**x*a*b*log(2))/(2*a**3*log(2)**2), N
e(2*a**3*log(2)**2, 0)), (x*(-b**2/a**3 + (a**2 + a*b + b**2)/a**3), True))
 + b**2*x/a**3 + b**2*log(-a/b + 2**(-x))/(a**3*log(2))
```

3.480 $\int \frac{2^{2x}}{a-2^{-x}b}\,dx$

Optimal. Leaf size=58

$$\frac{b^2x}{a^3}+\frac{b^2\log\left(a-b2^{-x}\right)}{a^3\log(2)}+\frac{b2^x}{a^2\log(2)}+\frac{2^{2x-1}}{a\log(2)}$$

```
[Out] b^2*x/a^3+2^(-1+2*x)/a/ln(2)+2^x*b/a^2/ln(2)+b^2*ln(a-b/(2^x))/a^3/ln(2)
```

Rubi [A] time = 0.05, antiderivative size = 58, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2248, 44}

$$\frac{b^2x}{a^3}+\frac{b^2\log\left(a-b2^{-x}\right)}{a^3\log(2)}+\frac{b2^x}{a^2\log(2)}+\frac{2^{2x-1}}{a\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[2^(2*x)/(a - b/2^x),x]
```

```
[Out] (b^2*x)/a^3 + 2^(-1 + 2*x)/(a*Log[2]) + (2^x*b)/(a^2*Log[2]) + (b^2*Log[a - b/2^x])/(a^3*Log[2])
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2248

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(g*h*Log[G])/(d*e*Lo
g[F])]}, Dist[(Denominator[m]*G^(f*h - (c*g*h)/d))/(d*e*Log[F]), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^((e*(c + d*x))/De
nominator[m])], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int \frac{2^{2x}}{a-2^{-x}b}\,dx = -\frac{\text{Subst}\left(\int \frac{1}{x^3(a-bx)}\,dx, x, 2^{-x}\right)}{\log(2)}$$
$$= -\frac{\text{Subst}\left(\int \left(\frac{1}{ax^3}+\frac{b}{a^2x^2}+\frac{b^2}{a^3x}+\frac{b^3}{a^3(a-bx)}\right)dx, x, 2^{-x}\right)}{\log(2)}$$
$$= \frac{b^2x}{a^3}+\frac{2^{-1+2x}}{a\log(2)}+\frac{2^xb}{a^2\log(2)}+\frac{b^2\log\left(a-2^{-x}b\right)}{a^3\log(2)}$$

Mathematica [A] time = 0.02, size = 38, normalized size = 0.66

$$\frac{2b^2\log\left(a2^x-b\right)+a2^x\left(a2^x+2b\right)}{a^3\log(4)}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^(2*x)/(a - b/2^x),x]
[Out] (2^x*a*(2^x*a + 2*b) + 2*b^2*Log[2^x*a - b])/(a^3*Log[4])
```

fricas [A] time = 0.42, size = 41, normalized size = 0.71

$$\frac{2^{2x}a^2+2\cdot 2^xab+2\,b^2\log\left(2^xa-b\right)}{2\,a^3\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(2*x)/(a-b/(2^x)),x, algorithm="fricas")
[Out] 1/2*(2^(2*x)*a^2 + 2*2^x*a*b + 2*b^2*log(2^x*a - b))/(a^3*log(2))
```

giac [A] time = 0.38, size = 50, normalized size = 0.86

$$\frac{b^2\log\left(|2^xa-b|\right)}{a^3\log(2)}+\frac{2^{2x}a\log(2)+2\cdot 2^xb\log(2)}{2\,a^2\log(2)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(2*x)/(a-b/(2^x)),x, algorithm="giac")
[Out] b^2*log(abs(2^x*a - b))/(a^3*log(2)) + 1/2*(2^(2*x)*a*log(2) + 2*2^x*b*log(
2))/(a^2*log(2)^2)
```

maple [A] time = 0.03, size = 55, normalized size = 0.95

$$\frac{e^{2\ln(2)x}}{2\ln(2)a}+\frac{b\,e^{\ln(2)x}}{\ln(2)a^2}+\frac{b^2\ln\left(a\,e^{\ln(2)x}-b\right)}{\ln(2)a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^(2*x)/(a-b/(2^x)),x)
```

```
[Out] 1/ln(2)/a^2*b*exp(ln(2)*x)+1/2/a/ln(2)*exp(ln(2)*x)^2+1/ln(2)/a^3*b^2*ln(a*
exp(ln(2)*x)-b)
```

maxima [A] time = 0.85, size = 58, normalized size = 1.00

$$\frac{b^2x}{a^3}+\frac{\left(2^{-x+1}b+a\right)2^{2x-1}}{a^2\log(2)}+\frac{b^2\log\left(-a+\frac{b}{2^x}\right)}{a^3\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(2*x)/(a-b/(2^x)),x, algorithm="maxima")
```

```
[Out] b^2*x/a^3 + (2^(-x + 1)*b + a)*2^(2*x - 1)/(a^2*log(2)) + b^2*log(-a + b/2^
x)/(a^3*log(2))
```

mupad [B] time = 3.65, size = 47, normalized size = 0.81

$$\frac{2^{2x}}{2\,a\,\ln(2)}+\frac{2^x\,b}{a^2\,\ln(2)}+\frac{b^2\,\ln\left(b-2^x\,a\right)}{a^3\,\ln(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^(2*x)/(a - b/2^x),x)
```

```
[Out] 2^(2*x)/(2*a*log(2)) + (2^x*b)/(a^2*log(2)) + (b^2*log(b - 2^x*a))/(a^3*log
(2))
```

sympy [A] time = 0.23, size = 92, normalized size = 1.59

$$\begin{cases}\frac{2^{2x}a^2\log(2)+2\cdot 2^x ab\log(2)}{2a^3\log(2)^2} & \text{for } 2a^3\log(2)^2\neq 0\\ x\left(-\frac{b^2}{a^3}+\frac{a^2+ab+b^2}{a^3}\right) & \text{otherwise}\end{cases}+\frac{b^2x}{a^3}+\frac{b^2\log\left(-\frac{a}{b}+2^{-x}\right)}{a^3\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**(2*x)/(a-b/(2**x)),x)
```

```
[Out] Piecewise((((2**(2*x)*a**2*log(2) + 2*2**x*a*b*log(2))/(2*a**3*log(2)**2), N
e(2*a**3*log(2)**2, 0)), (x*(-b**2/a**3 + (a**2 + a*b + b**2)/a**3), True))
 + b**2*x/a**3 + b**2*log(-a/b + 2**(-x))/(a**3*log(2))
```

3.481 $\int \frac{2^x}{a+4^x b} \, dx$

Optimal. Leaf size=30

$$\frac{\tan^{-1}\left(\frac{\sqrt{b}\,2^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(2)}$$

```
[Out] arctan(2^x*b^(1/2)/a^(1/2))/ln(2)/a^(1/2)/b^(1/2)
```

Rubi [A] time = 0.03, antiderivative size = 30, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2249, 205}

$$\frac{\tan^{-1}\left(\frac{\sqrt{b}\,2^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[2^x/(a + 4^x*b),x]
```

```
[Out] ArcTan[(2^x*Sqrt[b])/Sqrt[a]]/(Sqrt[a]*Sqrt[b]*Log[2])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\int \frac{2^x}{a+4^x b}\,dx = \frac{\text{Subst}\left(\int \frac{1}{a+bx^2}\,dx, x, 2^x\right)}{\log(2)}$$
$$= \frac{\tan^{-1}\left(\frac{2^x\sqrt{b}}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log(2)}$$

Mathematica [A] time = 0.01, size = 30, normalized size = 1.00

$$\frac{\tan^{-1}\left(\frac{\sqrt{b}\,2^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log(2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^x/(a + 4^x*b),x]
[Out] ArcTan[(2^x*Sqrt[b])/Sqrt[a]]/(Sqrt[a]*Sqrt[b]*Log[2])
```

fricas [A] time = 0.45, size = 86, normalized size = 2.87

$$\left[-\frac{\sqrt{-ab}\log\left(\frac{2^{2x}b-2\sqrt{-ab}\,2^x-a}{2^{2x}b+a}\right)}{2\,ab\log(2)}, -\frac{\sqrt{ab}\arctan\left(\frac{\sqrt{ab}}{2^x b}\right)}{ab\log(2)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a+4^x*b),x, algorithm="fricas")
[Out] [-1/2*sqrt(-a*b)*log((2^(2*x)*b - 2*sqrt(-a*b)*2^x - a)/(2^(2*x)*b + a))/(a
*b*log(2)), -sqrt(a*b)*arctan(sqrt(a*b)/(2^x*b))/(a*b*log(2))]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{2^x}{4^x b + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a+4^x*b),x, algorithm="giac")
[Out] integrate(2^x/(4^x*b + a), x)
```

maple [B] time = 0.05, size = 53, normalized size = 1.77

$$-\frac{\ln\left(-\frac{a}{\sqrt{-ab}}+2^{x}\right)}{2\sqrt{-ab}\,\ln(2)}+\frac{\ln\left(\frac{a}{\sqrt{-ab}}+2^{x}\right)}{2\sqrt{-ab}\,\ln(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a+4^x*b),x)
```

```
[Out] -1/2/(-a*b)^(1/2)/ln(2)*ln(2^x-1/(-a*b)^(1/2)*a)+1/2/(-a*b)^(1/2)/ln(2)*ln(
2^x+1/(-a*b)^(1/2)*a)
```

maxima [A] time = 1.52, size = 21, normalized size = 0.70

$$\frac{\arctan\left(\frac{2^{x}b}{\sqrt{ab}}\right)}{\sqrt{ab}\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a+4^x*b),x, algorithm="maxima")
```

```
[Out] arctan(2^x*b/sqrt(a*b))/(sqrt(a*b)*log(2))
```

mupad [B] time = 3.54, size = 22, normalized size = 0.73

$$\frac{\operatorname{atan}\left(\frac{2^{x}\sqrt{b}}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\ln(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a + 4^x*b),x)
```

```
[Out] atan((2^x*b^(1/2))/a^(1/2))/(a^(1/2)*b^(1/2)*log(2))
```

sympy [A] time = 0.32, size = 29, normalized size = 0.97

$$\frac{\operatorname{RootSum}\left(4z^{2}ab+1,\left(i\mapsto i\log\left(2ia+e^{\frac{x\log(4)}{2}}\right)\right)\right)}{\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**x/(a+4**x*b),x)
```

```
[Out] RootSum(4*_z**2*a*b + 1, Lambda(_i, _i*log(2*_i*a + exp(x*log(4)/2))))/log(
2)
```

3.482 $\int \frac{2^x}{a+2^{2x}b}\,dx$

Optimal. Leaf size=30

$$\frac{\tan^{-1}\left(\frac{\sqrt{b}\,2^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(2)}$$

```
[Out] arctan(2^x*b^(1/2)/a^(1/2))/ln(2)/a^(1/2)/b^(1/2)
```

Rubi [A] time = 0.03, antiderivative size = 30, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {2249, 205}

$$\frac{\tan^{-1}\left(\frac{\sqrt{b}\,2^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[2^x/(a + 2^(2*x)*b),x]
```

```
[Out] ArcTan[(2^x*Sqrt[b])/Sqrt[a]]/(Sqrt[a]*Sqrt[b]*Log[2])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\int \frac{2^x}{a+2^{2x}b}\,dx = \frac{\text{Subst}\left(\int \frac{1}{a+bx^2}\,dx, x, 2^x\right)}{\log(2)}$$
$$= \frac{\tan^{-1}\left(\frac{2^x\sqrt{b}}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log(2)}$$

Mathematica [A] time = 0.00, size = 30, normalized size = 1.00

$$\frac{\tan^{-1}\left(\frac{\sqrt{b}\,2^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log(2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^x/(a + 2^(2*x)*b),x]
[Out] ArcTan[(2^x*Sqrt[b])/Sqrt[a]]/(Sqrt[a]*Sqrt[b]*Log[2])
```

fricas [A] time = 0.41, size = 86, normalized size = 2.87

$$\left[-\frac{\sqrt{-ab}\log\left(\frac{2^{2x}b-2\sqrt{-ab}\,2^x-a}{2^{2x}b+a}\right)}{2\,ab\log(2)}, -\frac{\sqrt{ab}\arctan\left(\frac{\sqrt{ab}}{2^x b}\right)}{ab\log(2)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a+2^(2*x)*b),x, algorithm="fricas")
[Out] [-1/2*sqrt(-a*b)*log((2^(2*x)*b - 2*sqrt(-a*b)*2^x - a)/(2^(2*x)*b + a))/(a
*b*log(2)), -sqrt(a*b)*arctan(sqrt(a*b)/(2^x*b))/(a*b*log(2))]
```

giac [A] time = 0.33, size = 21, normalized size = 0.70

$$\frac{\arctan\left(\frac{2^x b}{\sqrt{ab}}\right)}{\sqrt{ab}\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a+2^(2*x)*b),x, algorithm="giac")
[Out] arctan(2^x*b/sqrt(a*b))/(sqrt(a*b)*log(2))
```

maple [B] time = 0.05, size = 53, normalized size = 1.77

$$-\frac{\ln\left(-\frac{a}{\sqrt{-ab}}+2^{x}\right)}{2\sqrt{-ab}\,\ln(2)}+\frac{\ln\left(\frac{a}{\sqrt{-ab}}+2^{x}\right)}{2\sqrt{-ab}\,\ln(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a+2^(2*x)*b),x)
```

```
[Out] -1/2/(-a*b)^(1/2)/ln(2)*ln(-1/(-a*b)^(1/2)*a+2^x)+1/2/(-a*b)^(1/2)/ln(2)*ln
(1/(-a*b)^(1/2)*a+2^x)
```

maxima [A] time = 2.07, size = 21, normalized size = 0.70

$$\frac{\arctan\left(\frac{2^{x}b}{\sqrt{ab}}\right)}{\sqrt{ab}\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a+2^(2*x)*b),x, algorithm="maxima")
```

```
[Out] arctan(2^x*b/sqrt(a*b))/(sqrt(a*b)*log(2))
```

mupad [B] time = 3.58, size = 22, normalized size = 0.73

$$\frac{\operatorname{atan}\left(\frac{2^{x}\sqrt{b}}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\ln(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a + 2^(2*x)*b),x)
```

```
[Out] atan((2^x*b^(1/2))/a^(1/2))/(a^(1/2)*b^(1/2)*log(2))
```

sympy [A] time = 0.18, size = 24, normalized size = 0.80

$$\frac{\operatorname{RootSum}\left(4z^{2}ab+1,\left(i\mapsto i\log\left(2^{x}+2ia\right)\right)\right)}{\log\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**x/(a+2**(2*x)*b),x)
```

```
[Out] RootSum(4*_z**2*a*b + 1, Lambda(_i, _i*log(2**x + 2*_i*a)))/log(2)
```

3.483 $\int \frac{2^x}{a-4^x b} \, dx$

Optimal. Leaf size=30

$$\frac{\tanh^{-1}\left(\frac{\sqrt{b}\,2^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(2)}$$

```
[Out] arctanh(2^x*b^(1/2)/a^(1/2))/ln(2)/a^(1/2)/b^(1/2)
```

Rubi [A] time = 0.03, antiderivative size = 30, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2249, 208}

$$\frac{\tanh^{-1}\left(\frac{\sqrt{b}\,2^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[2^x/(a - 4^x*b),x]
```

```
[Out] ArcTanh[(2^x*Sqrt[b])/Sqrt[a]]/(Sqrt[a]*Sqrt[b]*Log[2])
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\int \frac{2^x}{a-4^x b}\,dx = \frac{\text{Subst}\left(\int \frac{1}{a-bx^2}\,dx, x, 2^x\right)}{\log(2)}$$
$$= \frac{\tanh^{-1}\left(\frac{2^x\sqrt{b}}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log(2)}$$

Mathematica [A] time = 0.01, size = 30, normalized size = 1.00

$$\frac{\tanh^{-1}\left(\frac{\sqrt{b}\,2^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log(2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^x/(a - 4^x*b),x]
[Out] ArcTanh[(2^x*Sqrt[b])/Sqrt[a]]/(Sqrt[a]*Sqrt[b]*Log[2])
```

fricas [A] time = 0.43, size = 86, normalized size = 2.87

$$\left[\frac{\sqrt{ab}\log\left(\frac{2^{2x}b+2\sqrt{ab}\,2^x+a}{2^{2x}b-a}\right)}{2\,ab\log(2)}, -\frac{\sqrt{-ab}\arctan\left(\frac{\sqrt{-ab}}{2^x b}\right)}{ab\log(2)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a-4^x*b),x, algorithm="fricas")
[Out] [1/2*sqrt(a*b)*log((2^(2*x)*b + 2*sqrt(a*b)*2^x + a)/(2^(2*x)*b - a))/(a*b*
log(2)), -sqrt(-a*b)*arctan(sqrt(-a*b)/(2^x*b))/(a*b*log(2))]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int -\frac{2^x}{4^x b - a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a-4^x*b),x, algorithm="giac")
[Out] integrate(-2^x/(4^x*b - a), x)
```

maple [B] time = 0.05, size = 49, normalized size = 1.63

$$-\frac{\ln\left(-\frac{a}{\sqrt{ab}}+2^{x}\right)}{2\sqrt{ab}\,\ln(2)}+\frac{\ln\left(\frac{a}{\sqrt{ab}}+2^{x}\right)}{2\sqrt{ab}\,\ln(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a-4^x*b),x)
```

```
[Out] 1/2/(a*b)^(1/2)/ln(2)*ln(2^x+1/(a*b)^(1/2)*a)-1/2/(a*b)^(1/2)/ln(2)*ln(2^x-
1/(a*b)^(1/2)*a)
```

maxima [B] time = 2.05, size = 45, normalized size = 1.50

$$-\frac{\log\left(\frac{2^{x+1}b-2\sqrt{ab}}{2^{x+1}b+2\sqrt{ab}}\right)}{2\sqrt{ab}\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a-4^x*b),x, algorithm="maxima")
```

```
[Out] -1/2*log((2^(x + 1)*b - 2*sqrt(a*b))/(2^(x + 1)*b + 2*sqrt(a*b)))/(sqrt(a*b
)*log(2))
```

mupad [B] time = 3.78, size = 22, normalized size = 0.73

$$\frac{\operatorname{atanh}\left(\frac{2^{x}\sqrt{b}}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\ln(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a - 4^x*b),x)
```

```
[Out] atanh((2^x*b^(1/2))/a^(1/2))/(a^(1/2)*b^(1/2)*log(2))
```

sympy [A] time = 0.33, size = 29, normalized size = 0.97

$$\frac{\operatorname{RootSum}\left(4z^{2}ab-1,\left(i\mapsto i\log\left(2ia+e^{\frac{x\log(4)}{2}}\right)\right)\right)}{\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**x/(a-4**x*b),x)
```

```
[Out] RootSum(4*_z**2*a*b - 1, Lambda(_i, _i*log(2*_i*a + exp(x*log(4)/2))))/log(
2)
```

3.484 $\int \frac{2^x}{a-2^{2x}b} \, dx$

Optimal. Leaf size=30

$$\frac{\tanh^{-1}\left(\frac{\sqrt{b}\,2^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(2)}$$

```
[Out] arctanh(2^x*b^(1/2)/a^(1/2))/ln(2)/a^(1/2)/b^(1/2)
```

Rubi [A] time = 0.03, antiderivative size = 30, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {2249, 208}

$$\frac{\tanh^{-1}\left(\frac{\sqrt{b}\,2^x}{\sqrt{a}}\right)}{\sqrt{a}\,\sqrt{b}\,\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[2^x/(a - 2^(2*x)*b),x]
```

```
[Out] ArcTanh[(2^x*Sqrt[b])/Sqrt[a]]/(Sqrt[a]*Sqrt[b]*Log[2])
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\int \frac{2^x}{a-2^{2x}b}\,dx = \frac{\text{Subst}\left(\int \frac{1}{a-bx^2}\,dx, x, 2^x\right)}{\log(2)}$$
$$= \frac{\tanh^{-1}\left(\frac{2^x\sqrt{b}}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log(2)}$$

Mathematica [A] time = 0.01, size = 30, normalized size = 1.00

$$\frac{\tanh^{-1}\left(\frac{\sqrt{b}2^x}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\log(2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^x/(a - 2^(2*x)*b),x]
```

```
[Out] ArcTanh[(2^x*Sqrt[b])/Sqrt[a]]/(Sqrt[a]*Sqrt[b]*Log[2])
```

fricas [A] time = 0.43, size = 86, normalized size = 2.87

$$\left[\frac{\sqrt{ab}\log\left(\frac{2^{2x}b+2\sqrt{ab}2^x+a}{2^{2x}b-a}\right)}{2ab\log(2)}, -\frac{\sqrt{-ab}\arctan\left(\frac{\sqrt{-ab}}{2^xb}\right)}{ab\log(2)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a-2^(2*x)*b),x, algorithm="fricas")
```

```
[Out] [1/2*sqrt(a*b)*log((2^(2*x)*b + 2*sqrt(a*b)*2^x + a)/(2^(2*x)*b - a))/(a*b*
log(2)), -sqrt(-a*b)*arctan(sqrt(-a*b)/(2^x*b))/(a*b*log(2))]
```

giac [A] time = 0.36, size = 24, normalized size = 0.80

$$-\frac{\arctan\left(\frac{2^xb}{\sqrt{-ab}}\right)}{\sqrt{-ab}\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a-2^(2*x)*b),x, algorithm="giac")
```

```
[Out] -arctan(2^x*b/sqrt(-a*b))/(sqrt(-a*b)*log(2))
```

maple [B] time = 0.05, size = 49, normalized size = 1.63

$$-\frac{\ln\left(-\frac{a}{\sqrt{ab}}+2^{x}\right)}{2\sqrt{ab}\,\ln(2)}+\frac{\ln\left(\frac{a}{\sqrt{ab}}+2^{x}\right)}{2\sqrt{ab}\,\ln(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a-2^(2*x)*b),x)
```

```
[Out] -1/2/(a*b)^(1/2)/ln(2)*ln(-1/(a*b)^(1/2)*a+2^x)+1/2/(a*b)^(1/2)/ln(2)*ln(1/
(a*b)^(1/2)*a+2^x)
```

maxima [B] time = 1.87, size = 45, normalized size = 1.50

$$-\frac{\log\left(\frac{2^{x+1}b-2\sqrt{ab}}{2^{x+1}b+2\sqrt{ab}}\right)}{2\sqrt{ab}\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a-2^(2*x)*b),x, algorithm="maxima")
```

```
[Out] -1/2*log((2^(x + 1)*b - 2*sqrt(a*b))/(2^(x + 1)*b + 2*sqrt(a*b)))/(sqrt(a*b
)*log(2))
```

mupad [B] time = 3.59, size = 22, normalized size = 0.73

$$\frac{\operatorname{atanh}\left(\frac{2^{x}\sqrt{b}}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}\,\ln(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a - 2^(2*x)*b),x)
```

```
[Out] atanh((2^x*b^(1/2))/a^(1/2))/(a^(1/2)*b^(1/2)*log(2))
```

sympy [A] time = 0.19, size = 24, normalized size = 0.80

$$\frac{\operatorname{RootSum}\left(4z^{2}ab-1,\left(i\mapsto i\log\left(2^{x}+2ia\right)\right)\right)}{\log\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**x/(a-2**(2*x)*b),x)
```

```
[Out] RootSum(4*_z**2*a*b - 1, Lambda(_i, _i*log(2**x + 2*_i*a)))/log(2)
```

3.485 $\int \frac{2^x}{a+4^{-x}b} \, dx$

Optimal. Leaf size=43

$$\frac{2^x}{a \log(2)} - \frac{\sqrt{b} \tan^{-1}\left(\frac{\sqrt{a} 2^x}{\sqrt{b}}\right)}{a^{3/2} \log(2)}$$

```
[Out] 2^x/a/ln(2)-arctan(2^x*a^(1/2)/b^(1/2))*b^(1/2)/a^(3/2)/ln(2)
```

Rubi [A] time = 0.04, antiderivative size = 43, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267, Rules used = {2249, 193, 321, 205}

$$\frac{2^x}{a \log(2)} - \frac{\sqrt{b} \tan^{-1}\left(\frac{\sqrt{a} 2^x}{\sqrt{b}}\right)}{a^{3/2} \log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[2^x/(a + b/4^x),x]
```

```
[Out] 2^x/(a*Log[2]) - (Sqrt[b]*ArcTan[(2^x*Sqrt[a])/Sqrt[b]])/(a^(3/2)*Log[2])
```

Rule 193

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[x^(n*p)*(b + a/x^n)^p,
x] /; FreeQ[{a, b}, x] && LtQ[n, 0] && IntegerQ[p]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
```

```
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$
\begin{aligned}
\int \frac{2^x}{a+4^{-x}b}\,dx &= \frac{\text{Subst}\left(\int \frac{1}{a+\frac{b}{x^2}}\,dx, x, 2^x\right)}{\log(2)} \\
&= \frac{\text{Subst}\left(\int \frac{x^2}{b+ax^2}\,dx, x, 2^x\right)}{\log(2)} \\
&= \frac{2^x}{a\log(2)} - \frac{b\,\text{Subst}\left(\int \frac{1}{b+ax^2}\,dx, x, 2^x\right)}{a\log(2)} \\
&= \frac{2^x}{a\log(2)} - \frac{\sqrt{b}\,\tan^{-1}\left(\frac{2^x\sqrt{a}}{\sqrt{b}}\right)}{a^{3/2}\log(2)}
\end{aligned}
$$

Mathematica [A] time = 0.02, size = 40, normalized size = 0.93

$$
\frac{\frac{2^x}{a} - \frac{\sqrt{b}\,\tan^{-1}\left(\frac{\sqrt{a}\,2^x}{\sqrt{b}}\right)}{a^{3/2}}}{\log(2)}
$$

Antiderivative was successfully verified.

```
[In] Integrate[2^x/(a + b/4^x),x]
[Out] (2^x/a - (Sqrt[b]*ArcTan[(2^x*Sqrt[a])/Sqrt[b]])/a^(3/2))/Log[2]
```

fricas [A] time = 0.42, size = 102, normalized size = 2.37

$$
\left[\frac{\sqrt{-\frac{b}{a}}\,\log\left(-\frac{2\cdot 2^x a\sqrt{-\frac{b}{a}} - 2^{2x}a + b}{2^{2x}a + b}\right) + 2\cdot 2^x}{2\,a\log(2)}, -\frac{\sqrt{\frac{b}{a}}\,\arctan\left(\frac{2^x a\sqrt{\frac{b}{a}}}{b}\right) - 2^x}{a\log(2)}\right]
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a+b/(4^x)),x, algorithm="fricas")
```

```
[Out] [1/2*(sqrt(-b/a)*log(-(2*2^x*a*sqrt(-b/a) - 2^(2*x)*a + b)/(2^(2*x)*a + b))
 + 2*2^x)/(a*log(2)), -(sqrt(b/a)*arctan(2^x*a*sqrt(b/a)/b) - 2^x)/(a*log(2
))]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{2^x}{a + \frac{b}{4^x}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a+b/(4^x)),x, algorithm="giac")
```

```
[Out] integrate(2^x/(a + b/4^x), x)
```

maple [B] time = 0.05, size = 74, normalized size = 1.72

$$\frac{2^x}{\ln(2)a} + \frac{\sqrt{-ab}\,\ln\left(2^x - \frac{\sqrt{-ab}}{a}\right)}{2\ln(2)a^2} - \frac{\sqrt{-ab}\,\ln\left(2^x + \frac{\sqrt{-ab}}{a}\right)}{2\ln(2)a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a+b/(4^x)),x)
```

```
[Out] 2^x/a/ln(2)+1/2/a^2*(-a*b)^(1/2)/ln(2)*ln(2^x-1/a*(-a*b)^(1/2))-1/2/a^2*(-a
*b)^(1/2)/ln(2)*ln(2^x+1/a*(-a*b)^(1/2))
```

maxima [A] time = 1.98, size = 68, normalized size = 1.58

$$\frac{b\arctan\left(\frac{b}{\sqrt{ab}\,2^x}\right)}{\sqrt{ab}\,a\log(2)} + \frac{4^{\frac{1}{2}x}a + \frac{b}{4^{\frac{1}{2}x}}}{a^2\log(2)} - \frac{b}{2^x a^2\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a+b/(4^x)),x, algorithm="maxima")
```

```
[Out] b*arctan(b/(sqrt(a*b)*2^x))/(sqrt(a*b)*a*log(2)) + (4^(1/2*x)*a + b/4^(1/2*
x))/(a^2*log(2)) - b/(2^x*a^2*log(2))
```

mupad [B] time = 3.61, size = 35, normalized size = 0.81

$$\frac{2^x}{a\,\ln(2)} - \frac{\sqrt{b}\,\mathrm{atan}\left(\frac{2^x\sqrt{a}}{\sqrt{b}}\right)}{a^{3/2}\,\ln(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a + b/4^x),x)
```

```
[Out] 2^x/(a*log(2)) - (b^(1/2)*atan((2^x*a^(1/2))/b^(1/2)))/(a^(3/2)*log(2))
```

sympy [A] time = 0.38, size = 54, normalized size = 1.26

$$\begin{cases} \frac{e^{\frac{x\log(4)}{2}}}{a\log(2)} & \text{for } a\log(2) \neq 0 \\ \frac{x}{a} & \text{otherwise} \end{cases} + \frac{\operatorname{RootSum}\left(4z^2a^3 + b, \left(i \mapsto i\log\left(\frac{2ia^2}{b} + e^{-\frac{x\log(4)}{2}}\right)\right)\right)}{\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**x/(a+b/(4**x)),x)
```

```
[Out] Piecewise((exp(x*log(4)/2)/(a*log(2)), Ne(a*log(2), 0)), (x/a, True)) + Roo
tSum(4*_z**2*a**3 + b, Lambda(_i, _i*log(2*_i*a**2/b + exp(-x*log(4)/2))))/
log(2)
```

3.486 $\int \frac{2^x}{a+2^{-2x}b}\,dx$

Optimal. Leaf size=43

$$\frac{2^x}{a\log(2)}-\frac{\sqrt{b}\,\tan^{-1}\left(\frac{\sqrt{a}\,2^x}{\sqrt{b}}\right)}{a^{3/2}\log(2)}$$

```
[Out] 2^x/a/ln(2)-arctan(2^x*a^(1/2)/b^(1/2))*b^(1/2)/a^(3/2)/ln(2)
```

Rubi [A] time = 0.04, antiderivative size = 43, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267, Rules used = {2249, 193, 321, 205}

$$\frac{2^x}{a\log(2)}-\frac{\sqrt{b}\,\tan^{-1}\left(\frac{\sqrt{a}\,2^x}{\sqrt{b}}\right)}{a^{3/2}\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[2^x/(a + b/2^(2*x)),x]
```

```
[Out] 2^x/(a*Log[2]) - (Sqrt[b]*ArcTan[(2^x*Sqrt[a])/Sqrt[b]])/(a^(3/2)*Log[2])
```

Rule 193

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[x^(n*p)*(b + a/x^n)^p,
x] /; FreeQ[{a, b}, x] && LtQ[n, 0] && IntegerQ[p]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
```

```
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{2^x}{a+2^{-2x}b}\,dx &= \frac{\mathrm{Subst}\left(\int \frac{1}{a+\frac{b}{x^2}}\,dx, x, 2^x\right)}{\log(2)}\\ &= \frac{\mathrm{Subst}\left(\int \frac{x^2}{b+ax^2}\,dx, x, 2^x\right)}{\log(2)}\\ &= \frac{2^x}{a\log(2)} - \frac{b\,\mathrm{Subst}\left(\int \frac{1}{b+ax^2}\,dx, x, 2^x\right)}{a\log(2)}\\ &= \frac{2^x}{a\log(2)} - \frac{\sqrt{b}\tan^{-1}\left(\frac{2^x\sqrt{a}}{\sqrt{b}}\right)}{a^{3/2}\log(2)}\end{aligned}$$

Mathematica [A] time = 0.01, size = 40, normalized size = 0.93

$$\frac{\frac{2^x}{a} - \frac{\sqrt{b}\tan^{-1}\left(\frac{\sqrt{a}2^x}{\sqrt{b}}\right)}{a^{3/2}}}{\log(2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^x/(a + b/2^(2*x)),x]
[Out] (2^x/a - (Sqrt[b]*ArcTan[(2^x*Sqrt[a])/Sqrt[b]])/a^(3/2))/Log[2]
```

fricas [A] time = 0.46, size = 102, normalized size = 2.37

$$\left[\frac{\sqrt{-\frac{b}{a}}\log\left(-\frac{2\cdot 2^x a\sqrt{-\frac{b}{a}} - 2^{2x}a + b}{2^{2x}a + b}\right) + 2\cdot 2^x}{2a\log(2)}, -\frac{\sqrt{\frac{b}{a}}\arctan\left(\frac{2^x a\sqrt{\frac{b}{a}}}{b}\right) - 2^x}{a\log(2)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a+b/(2^(2*x))),x, algorithm="fricas")
```

```
[Out] [1/2*(sqrt(-b/a)*log(-(2*2^x*a*sqrt(-b/a) - 2^(2*x)*a + b)/(2^(2*x)*a + b))
 + 2*2^x)/(a*log(2)), -(sqrt(b/a)*arctan(2^x*a*sqrt(b/a)/b) - 2^x)/(a*log(2
))]
```

giac [A] time = 0.39, size = 38, normalized size = 0.88

$$-\frac{b \arctan\left(\frac{2^x a}{\sqrt{ab}}\right)}{\sqrt{ab}\, a \log(2)} + \frac{2^x}{a \log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a+b/(2^(2*x))),x, algorithm="giac")
```

```
[Out] -b*arctan(2^x*a/sqrt(a*b))/(sqrt(a*b)*a*log(2)) + 2^x/(a*log(2))
```

maple [B] time = 0.05, size = 74, normalized size = 1.72

$$\frac{2^x}{\ln(2) a} + \frac{\sqrt{-ab}\, \ln\left(2^x - \frac{\sqrt{-ab}}{a}\right)}{2 \ln(2) a^2} - \frac{\sqrt{-ab}\, \ln\left(2^x + \frac{\sqrt{-ab}}{a}\right)}{2 \ln(2) a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a+b/(2^(2*x))),x)
```

```
[Out] 1/ln(2)/a*2^x+1/2*(-a*b)^(1/2)/ln(2)/a^2*ln(2^x-(-a*b)^(1/2)/a)-1/2*(-a*b)^
(1/2)/ln(2)/a^2*ln(2^x+(-a*b)^(1/2)/a)
```

maxima [A] time = 1.87, size = 39, normalized size = 0.91

$$\frac{b \arctan\left(\frac{b}{\sqrt{ab}\, 2^x}\right)}{\sqrt{ab}\, a \log(2)} + \frac{2^x}{a \log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a+b/(2^(2*x))),x, algorithm="maxima")
```

```
[Out] b*arctan(b/(sqrt(a*b)*2^x))/(sqrt(a*b)*a*log(2)) + 2^x/(a*log(2))
```

mupad [B] time = 3.54, size = 35, normalized size = 0.81

$$\frac{2^x}{a\, \ln(2)} - \frac{\sqrt{b}\, \mathrm{atan}\left(\frac{2^x \sqrt{a}}{\sqrt{b}}\right)}{a^{3/2}\, \ln(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a + b/2^(2*x)),x)
```

```
[Out] 2^x/(a*log(2)) - (b^(1/2)*atan((2^x*a^(1/2))/b^(1/2)))/(a^(3/2)*log(2))
```

sympy [A] time = 0.24, size = 44, normalized size = 1.02

$$\begin{cases} \frac{2^x}{a\log(2)} & \text{for } a\log(2) \neq 0 \\ \frac{x}{a} & \text{otherwise} \end{cases} + \frac{\operatorname{RootSum}\left(4z^2a^3 + b, \left(i \mapsto i\log\left(\frac{2ia^2}{b} + 2^{-x}\right)\right)\right)}{\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**x/(a+b/(2**(2*x))),x)
```

```
[Out] Piecewise((2**x/(a*log(2)), Ne(a*log(2), 0)), (x/a, True)) + RootSum(4*_z**
2*a**3 + b, Lambda(_i, _i*log(2*_i*a**2/b + 2**(-x))))/log(2)
```

3.487 $\int \frac{2^x}{a-4^{-x}b}\,dx$

Optimal. Leaf size=43

$$\frac{2^x}{a\log(2)}-\frac{\sqrt{b}\,\tanh^{-1}\left(\frac{\sqrt{a}\,2^x}{\sqrt{b}}\right)}{a^{3/2}\log(2)}$$

```
[Out] 2^x/a/ln(2)-arctanh(2^x*a^(1/2)/b^(1/2))*b^(1/2)/a^(3/2)/ln(2)
```

Rubi [A] time = 0.04, antiderivative size = 43, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {2249, 193, 321, 208}

$$\frac{2^x}{a\log(2)}-\frac{\sqrt{b}\,\tanh^{-1}\left(\frac{\sqrt{a}\,2^x}{\sqrt{b}}\right)}{a^{3/2}\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[2^x/(a - b/4^x),x]
```

```
[Out] 2^x/(a*Log[2]) - (Sqrt[b]*ArcTanh[(2^x*Sqrt[a])/Sqrt[b]])/(a^(3/2)*Log[2])
```

Rule 193

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[x^(n*p)*(b + a/x^n)^p,
x] /; FreeQ[{a, b}, x] && LtQ[n, 0] && IntegerQ[p]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
```

```
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{2^x}{a-4^{-x}b}\,dx &= \frac{\operatorname{Subst}\left(\int \frac{1}{a-\frac{b}{x^2}}\,dx,x,2^x\right)}{\log(2)}\\ &= \frac{\operatorname{Subst}\left(\int \frac{x^2}{-b+ax^2}\,dx,x,2^x\right)}{\log(2)}\\ &= \frac{2^x}{a\log(2)}+\frac{b\operatorname{Subst}\left(\int \frac{1}{-b+ax^2}\,dx,x,2^x\right)}{a\log(2)}\\ &= \frac{2^x}{a\log(2)}-\frac{\sqrt{b}\,\tanh^{-1}\left(\frac{2^x\sqrt{a}}{\sqrt{b}}\right)}{a^{3/2}\log(2)}\end{aligned}$$

Mathematica [A] time = 0.02, size = 40, normalized size = 0.93

$$\frac{\frac{2^x}{a}-\frac{\sqrt{b}\,\tanh^{-1}\left(\frac{\sqrt{a}\,2^x}{\sqrt{b}}\right)}{a^{3/2}}}{\log(2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^x/(a - b/4^x),x]
[Out] (2^x/a - (Sqrt[b]*ArcTanh[(2^x*Sqrt[a])/Sqrt[b]])/a^(3/2))/Log[2]
```

fricas [A] time = 0.43, size = 103, normalized size = 2.40

$$\left[\frac{\sqrt{\frac{b}{a}}\,\log\left(-\frac{2\cdot 2^x a\sqrt{\frac{b}{a}}-2^{2x}a-b}{2^{2x}a-b}\right)+2\cdot 2^x}{2\,a\log(2)},\ \frac{\sqrt{-\frac{b}{a}}\,\arctan\left(\frac{2^x a\sqrt{-\frac{b}{a}}}{b}\right)+2^x}{a\log(2)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a-b/(4^x)),x, algorithm="fricas")
```

```
[Out] [1/2*(sqrt(b/a)*log(-(2*2^x*a*sqrt(b/a) - 2^(2*x)*a - b)/(2^(2*x)*a - b)) +
 2*2^x)/(a*log(2)), (sqrt(-b/a)*arctan(2^x*a*sqrt(-b/a)/b) + 2^x)/(a*log(2)
)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{2^x}{a - \frac{b}{4^x}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a-b/(4^x)),x, algorithm="giac")
```

```
[Out] integrate(2^x/(a - b/4^x), x)
```

maple [A] time = 0.05, size = 70, normalized size = 1.63

$$\frac{2^x}{\ln(2)a} + \frac{\sqrt{ab}\,\ln\left(2^x - \frac{\sqrt{ab}}{a}\right)}{2\ln(2)a^2} - \frac{\sqrt{ab}\,\ln\left(2^x + \frac{\sqrt{ab}}{a}\right)}{2\ln(2)a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a-b/(4^x)),x)
```

```
[Out] 1/ln(2)/a*2^x+1/2/a^2*(a*b)^(1/2)/ln(2)*ln(2^x-1/a*(a*b)^(1/2))-1/2/a^2*(a*
b)^(1/2)/ln(2)*ln(2^x+1/a*(a*b)^(1/2))
```

maxima [B] time = 2.16, size = 88, normalized size = 2.05

$$\frac{b\log\left(-\frac{\sqrt{ab}-\frac{b}{2^x}}{\sqrt{ab}+\frac{b}{2^x}}\right)}{2\sqrt{ab}\,a\log(2)} + \frac{4^{\frac{1}{2}x}a - \frac{b}{4^{\frac{1}{2}x}}}{a^2\log(2)} + \frac{b}{2^x a^2\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a-b/(4^x)),x, algorithm="maxima")
```

```
[Out] 1/2*b*log(-(sqrt(a*b) - b/2^x)/(sqrt(a*b) + b/2^x))/(sqrt(a*b)*a*log(2)) +
(4^(1/2*x)*a - b/4^(1/2*x))/(a^2*log(2)) + b/(2^x*a^2*log(2))
```

mupad [B] time = 3.68, size = 35, normalized size = 0.81

$$\frac{2^x}{a\,\ln(2)} - \frac{\sqrt{b}\,\mathrm{atanh}\left(\frac{2^x\sqrt{a}}{\sqrt{b}}\right)}{a^{3/2}\,\ln(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a - b/4^x),x)
```

```
[Out] 2^x/(a*log(2)) - (b^(1/2)*atanh((2^x*a^(1/2))/b^(1/2)))/(a^(3/2)*log(2))
```

sympy [A] time = 0.39, size = 54, normalized size = 1.26

$$\begin{cases} \frac{e^{\frac{x\log(4)}{2}}}{a\log(2)} & \text{for } a\log(2) \neq 0 \\ \frac{x}{a} & \text{otherwise} \end{cases} + \frac{\operatorname{RootSum}\left(4z^2a^3 - b, \left(i \mapsto i\log\left(-\frac{2ia^2}{b} + e^{-\frac{x\log(4)}{2}}\right)\right)\right)}{\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**x/(a-b/(4**x)),x)
```

```
[Out] Piecewise((exp(x*log(4)/2)/(a*log(2)), Ne(a*log(2), 0)), (x/a, True)) + Roo
tSum(4*_z**2*a**3 - b, Lambda(_i, _i*log(-2*_i*a**2/b + exp(-x*log(4)/2))))
/log(2)
```

3.488 $\int \frac{2^x}{a-2^{-2x}b} \, dx$

Optimal. Leaf size=43

$$\frac{2^x}{a\log(2)} - \frac{\sqrt{b}\tanh^{-1}\left(\frac{\sqrt{a}\,2^x}{\sqrt{b}}\right)}{a^{3/2}\log(2)}$$

```
[Out] 2^x/a/ln(2)-arctanh(2^x*a^(1/2)/b^(1/2))*b^(1/2)/a^(3/2)/ln(2)
```

Rubi [A] time = 0.04, antiderivative size = 43, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}} =$ 0.250, Rules used = {2249, 193, 321, 208}

$$\frac{2^x}{a\log(2)} - \frac{\sqrt{b}\tanh^{-1}\left(\frac{\sqrt{a}\,2^x}{\sqrt{b}}\right)}{a^{3/2}\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[2^x/(a - b/2^(2*x)),x]
```

```
[Out] 2^x/(a*Log[2]) - (Sqrt[b]*ArcTanh[(2^x*Sqrt[a])/Sqrt[b]])/(a^(3/2)*Log[2])
```

Rule 193

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[x^(n*p)*(b + a/x^n)^p,
x] /; FreeQ[{a, b}, x] && LtQ[n, 0] && IntegerQ[p]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
```

```
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{2^x}{a-2^{-2x}b}\,dx &= \frac{\text{Subst}\left(\int \frac{1}{a-\frac{b}{x^2}}\,dx, x, 2^x\right)}{\log(2)}\\ &= \frac{\text{Subst}\left(\int \frac{x^2}{-b+ax^2}\,dx, x, 2^x\right)}{\log(2)}\\ &= \frac{2^x}{a\log(2)}+\frac{b\,\text{Subst}\left(\int \frac{1}{-b+ax^2}\,dx, x, 2^x\right)}{a\log(2)}\\ &= \frac{2^x}{a\log(2)}-\frac{\sqrt{b}\,\tanh^{-1}\left(\frac{2^x\sqrt{a}}{\sqrt{b}}\right)}{a^{3/2}\log(2)}\end{aligned}$$

Mathematica [A] time = 0.01, size = 40, normalized size = 0.93

$$\frac{\frac{2^x}{a}-\frac{\sqrt{b}\,\tanh^{-1}\left(\frac{\sqrt{a}\,2^x}{\sqrt{b}}\right)}{a^{3/2}}}{\log(2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^x/(a - b/2^(2*x)),x]
[Out] (2^x/a - (Sqrt[b]*ArcTanh[(2^x*Sqrt[a])/Sqrt[b]])/a^(3/2))/Log[2]
```

fricas [A] time = 0.44, size = 103, normalized size = 2.40

$$\left[\frac{\sqrt{\frac{b}{a}}\,\log\left(-\frac{2\cdot 2^x a\sqrt{\frac{b}{a}}-2^{2\,x}a-b}{2^{2\,x}a-b}\right)+2\cdot 2^x}{2\,a\log(2)}, \frac{\sqrt{-\frac{b}{a}}\,\arctan\left(\frac{2^x a\sqrt{-\frac{b}{a}}}{b}\right)+2^x}{a\log(2)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a-b/(2^(2*x))),x, algorithm="fricas")
```

```
[Out] [1/2*(sqrt(b/a)*log(-(2*2^x*a*sqrt(b/a) - 2^(2*x)*a - b)/(2^(2*x)*a - b)) +
 2*2^x)/(a*log(2)), (sqrt(-b/a)*arctan(2^x*a*sqrt(-b/a)/b) + 2^x)/(a*log(2)
)]
```

giac [A] time = 0.26, size = 39, normalized size = 0.91

$$\frac{b \arctan\left(\frac{2^{x} a}{\sqrt{-ab}}\right)}{\sqrt{-ab}\, a \log(2)} + \frac{2^{x}}{a \log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a-b/(2^(2*x))),x, algorithm="giac")
```

```
[Out] b*arctan(2^x*a/sqrt(-a*b))/(sqrt(-a*b)*a*log(2)) + 2^x/(a*log(2))
```

maple [A] time = 0.05, size = 70, normalized size = 1.63

$$\frac{2^{x}}{\ln(2) a} + \frac{\sqrt{ab}\;\ln\left(2^{x} - \frac{\sqrt{ab}}{a}\right)}{2 \ln(2) a^{2}} - \frac{\sqrt{ab}\;\ln\left(2^{x} + \frac{\sqrt{ab}}{a}\right)}{2 \ln(2) a^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a-b/(2^(2*x))),x)
```

```
[Out] 1/ln(2)/a*2^x+1/2*(a*b)^(1/2)/ln(2)/a^2*ln(2^x-(a*b)^(1/2)/a)-1/2*(a*b)^(1/
2)/ln(2)/a^2*ln(2^x+(a*b)^(1/2)/a)
```

maxima [A] time = 2.02, size = 65, normalized size = 1.51

$$\frac{b \log\left(\frac{2^{-x+1} b - 2\sqrt{ab}}{2^{-x+1} b + 2\sqrt{ab}}\right)}{2\sqrt{ab}\, a \log(2)} + \frac{2^{x}}{a \log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a-b/(2^(2*x))),x, algorithm="maxima")
```

```
[Out] 1/2*b*log((2^(-x + 1)*b - 2*sqrt(a*b))/(2^(-x + 1)*b + 2*sqrt(a*b)))/(sqrt(
a*b)*a*log(2)) + 2^x/(a*log(2))
```

mupad [B] time = 3.62, size = 35, normalized size = 0.81

$$\frac{2^{x}}{a\;\ln(2)} - \frac{\sqrt{b}\;\mathrm{atanh}\left(\frac{2^{x}\sqrt{a}}{\sqrt{b}}\right)}{a^{3/2}\;\ln(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a - b/2^(2*x)),x)
```

```
[Out] 2^x/(a*log(2)) - (b^(1/2)*atanh((2^x*a^(1/2))/b^(1/2)))/(a^(3/2)*log(2))
```

sympy [A] time = 0.25, size = 44, normalized size = 1.02

$$\begin{cases} \frac{2^{x}}{a \log(2)} & \text{for } a \log(2) \neq 0 \\ \frac{x}{a} & \text{otherwise} \end{cases} + \frac{\operatorname{RootSum}\left(4z^{2}a^{3} - b, \left(i \mapsto i \log\left(-\frac{2ia^{2}}{b} + 2^{-x}\right)\right)\right)}{\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**x/(a-b/(2**(2*x))),x)
```

```
[Out] Piecewise((2**x/(a*log(2)), Ne(a*log(2), 0)), (x/a, True)) + RootSum(4*_z**
2*a**3 - b, Lambda(_i, _i*log(-2*_i*a**2/b + 2**(-x))))/log(2)
```

3.489 $\int \frac{2^x}{\sqrt{a+4^x b}}\,dx$

Optimal. Leaf size=31

$$\frac{\tanh^{-1}\left(\frac{\sqrt{b}\,2^x}{\sqrt{a+b4^x}}\right)}{\sqrt{b}\,\log(2)}$$

```
[Out] arctanh(2^x*b^(1/2)/(a+4^x*b)^(1/2))/ln(2)/b^(1/2)
```

Rubi [A] time = 0.04, antiderivative size = 31, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2249, 217, 206}

$$\frac{\tanh^{-1}\left(\frac{\sqrt{b}\,2^x}{\sqrt{a+b4^x}}\right)}{\sqrt{b}\,\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[2^x/Sqrt[a + 4^x*b],x]
```

```
[Out] ArcTanh[(2^x*Sqrt[b])/Sqrt[a + 4^x*b]]/(Sqrt[b]*Log[2])
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\int \frac{2^x}{\sqrt{a+4^x b}}\,dx = \frac{\text{Subst}\left(\int \frac{1}{\sqrt{a+bx^2}}\,dx, x, 2^x\right)}{\log(2)}$$
$$= \frac{\text{Subst}\left(\int \frac{1}{1-bx^2}\,dx, x, \frac{2^x}{\sqrt{a+4^x b}}\right)}{\log(2)}$$
$$= \frac{\tanh^{-1}\left(\frac{2^x\sqrt{b}}{\sqrt{a+4^x b}}\right)}{\sqrt{b}\log(2)}$$

Mathematica [A] time = 0.01, size = 33, normalized size = 1.06

$$\frac{\tanh^{-1}\left(\frac{\sqrt{b}2^x}{\sqrt{a+b2^{2x}}}\right)}{\sqrt{b}\log(2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^x/Sqrt[a + 4^x*b],x]
[Out] ArcTanh[(2^x*Sqrt[b])/Sqrt[a + 2^(2*x)*b]]/(Sqrt[b]*Log[2])
```

fricas [A] time = 0.43, size = 77, normalized size = 2.48

$$\left[\frac{\log\left(-2\sqrt{2^{2x}b+a}\,2^x\sqrt{b}-2\cdot 2^{2x}b-a\right)}{2\sqrt{b}\log(2)}, -\frac{\sqrt{-b}\arctan\left(\frac{2^x\sqrt{-b}}{\sqrt{2^{2x}b+a}}\right)}{b\log(2)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a+4^x*b)^(1/2),x, algorithm="fricas")
[Out] [1/2*log(-2*sqrt(2^(2*x)*b + a)*2^x*sqrt(b) - 2*2^(2*x)*b - a)/(sqrt(b)*log
(2)), -sqrt(-b)*arctan(2^x*sqrt(-b)/sqrt(2^(2*x)*b + a))/(b*log(2))]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{2^x}{\sqrt{4^x b + a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a+4^x*b)^(1/2),x, algorithm="giac")
[Out] integrate(2^x/sqrt(4^x*b + a), x)
```

maple [F(-2)] time = 180.00, size = 0, normalized size = 0.00

$$\int \frac{2^x}{\sqrt{b4^x + a}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a+4^x*b)^(1/2),x)
[Out] int(2^x/(a+4^x*b)^(1/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{2^x}{\sqrt{4^x b + a}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a+4^x*b)^(1/2),x, algorithm="maxima")
[Out] integrate(2^x/sqrt(4^x*b + a), x)
```

mupad [B] time = 3.68, size = 28, normalized size = 0.90

$$\frac{\ln\left(\sqrt{a+2^{2\,x}\,b}+2^x\,\sqrt{b}\right)}{\sqrt{b}\,\ln(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a + 4^x*b)^(1/2),x)
[Out] log((a + 2^(2*x)*b)^(1/2) + 2^x*b^(1/2))/(b^(1/2)*log(2))
```

sympy [A] time = 0.82, size = 85, normalized size = 2.74

$$\frac{\begin{cases} \frac{\sqrt{-\frac{a}{b}}\,\operatorname{asin}\left(2^x\sqrt{-\frac{b}{a}}\right)}{\sqrt{a}} & \text{for}\ a > 0 \wedge b < 0 \\ \frac{\sqrt{\frac{a}{b}}\,\operatorname{asinh}\left(2^x\sqrt{\frac{b}{a}}\right)}{\sqrt{a}} & \text{for}\ a > 0 \wedge b > 0 \\ \frac{\sqrt{-\frac{a}{b}}\,\operatorname{acosh}\left(2^x\sqrt{-\frac{b}{a}}\right)}{\sqrt{-a}} & \text{for}\ b > 0 \wedge a < 0 \end{cases}}{\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**x/(a+4**x*b)**(1/2),x)
```

```
[Out] Piecewise((sqrt(-a/b)*asin(2**x*sqrt(-b/a))/sqrt(a), (a > 0) & (b < 0)), (s
qrt(a/b)*asinh(2**x*sqrt(b/a))/sqrt(a), (a > 0) & (b > 0)), (sqrt(-a/b)*aco
sh(2**x*sqrt(-b/a))/sqrt(-a), (b > 0) & (a < 0)))/log(2)
```

3.490 $\int \frac{2^x}{\sqrt{a+2^{2x}b}}\,dx$

Optimal. Leaf size=31

$$\frac{\tanh^{-1}\left(\frac{\sqrt{b}\,2^x}{\sqrt{a+b4^x}}\right)}{\sqrt{b}\,\log(2)}$$

```
[Out] arctanh(2^x*b^(1/2)/(a+4^x*b)^(1/2))/ln(2)/b^(1/2)
```

Rubi [A] time = 0.04, antiderivative size = 31, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.176, Rules used = {2249, 217, 206}

$$\frac{\tanh^{-1}\left(\frac{\sqrt{b}\,2^x}{\sqrt{a+b4^x}}\right)}{\sqrt{b}\,\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[2^x/Sqrt[a + 2^(2*x)*b],x]
```

```
[Out] ArcTanh[(2^x*Sqrt[b])/Sqrt[a + 4^x*b]]/(Sqrt[b]*Log[2])
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\int \frac{2^x}{\sqrt{a+2^{2x}b}}\,dx = \frac{\text{Subst}\left(\int \frac{1}{\sqrt{a+bx^2}}\,dx, x, 2^x\right)}{\log(2)}$$
$$= \frac{\text{Subst}\left(\int \frac{1}{1-bx^2}\,dx, x, \frac{2^x}{\sqrt{a+4^x b}}\right)}{\log(2)}$$
$$= \frac{\tanh^{-1}\left(\frac{2^x\sqrt{b}}{\sqrt{a+4^x b}}\right)}{\sqrt{b}\log(2)}$$

Mathematica [A] time = 0.00, size = 33, normalized size = 1.06

$$\frac{\tanh^{-1}\left(\frac{\sqrt{b}2^x}{\sqrt{a+b2^{2x}}}\right)}{\sqrt{b}\log(2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^x/Sqrt[a + 2^(2*x)*b],x]
[Out] ArcTanh[(2^x*Sqrt[b])/Sqrt[a + 2^(2*x)*b]]/(Sqrt[b]*Log[2])
```

fricas [A] time = 0.44, size = 77, normalized size = 2.48

$$\left[\frac{\log\left(-2\sqrt{2^{2x}b+a}\,2^x\sqrt{b}-2\cdot 2^{2x}b-a\right)}{2\sqrt{b}\log(2)}, -\frac{\sqrt{-b}\arctan\left(\frac{2^x\sqrt{-b}}{\sqrt{2^{2x}b+a}}\right)}{b\log(2)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a+2^(2*x)*b)^(1/2),x, algorithm="fricas")
[Out] [1/2*log(-2*sqrt(2^(2*x)*b + a)*2^x*sqrt(b) - 2*2^(2*x)*b - a)/(sqrt(b)*log
(2)), -sqrt(-b)*arctan(2^x*sqrt(-b)/sqrt(2^(2*x)*b + a))/(b*log(2))]
```

giac [A] time = 0.63, size = 31, normalized size = 1.00

$$-\frac{\log\left(\left|-2^x\sqrt{b}+\sqrt{2^{2x}b+a}\right|\right)}{\sqrt{b}\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a+2^(2*x)*b)^(1/2),x, algorithm="giac")
```

```
[Out] -log(abs(-2^x*sqrt(b) + sqrt(2^(2*x)*b + a)))/(sqrt(b)*log(2))
```

maple [F(-2)] time = 180.00, size = 0, normalized size = 0.00

$$\int \frac{2^{x}}{\sqrt{b 2^{2x} + a}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a+2^(2*x)*b)^(1/2),x)
```

```
[Out] int(2^x/(a+2^(2*x)*b)^(1/2),x)
```

maxima [A] time = 0.78, size = 22, normalized size = 0.71

$$\frac{\operatorname{arsinh}\left(\frac{2^{x+1} b}{2 \sqrt{ab}}\right)}{\sqrt{b} \log\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a+2^(2*x)*b)^(1/2),x, algorithm="maxima")
```

```
[Out] arcsinh(1/2*2^(x + 1)*b/sqrt(a*b))/(sqrt(b)*log(2))
```

mupad [B] time = 3.71, size = 28, normalized size = 0.90

$$\frac{\ln\left(\sqrt{a + 2^{2\,x}\,b} + 2^{x}\,\sqrt{b}\right)}{\sqrt{b}\,\ln\left(2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a + 2^(2*x)*b)^(1/2),x)
```

```
[Out] log((a + 2^(2*x)*b)^(1/2) + 2^x*b^(1/2))/(b^(1/2)*log(2))
```

sympy [A] time = 0.92, size = 85, normalized size = 2.74

$$\frac{\begin{cases} \frac{\sqrt{-\frac{a}{b}}\,\operatorname{asin}\left(2^{x}\sqrt{-\frac{b}{a}}\right)}{\sqrt{a}} & \text{for } a>0\wedge b<0 \\ \frac{\sqrt{\frac{a}{b}}\,\operatorname{asinh}\left(2^{x}\sqrt{\frac{b}{a}}\right)}{\sqrt{a}} & \text{for } a>0\wedge b>0 \\ \frac{\sqrt{-\frac{a}{b}}\,\operatorname{acosh}\left(2^{x}\sqrt{-\frac{b}{a}}\right)}{\sqrt{-a}} & \text{for } b>0\wedge a<0 \end{cases}}{\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**x/(a+2**(2*x)*b)**(1/2),x)
```

```
[Out] Piecewise((sqrt(-a/b)*asin(2**x*sqrt(-b/a))/sqrt(a), (a > 0) & (b < 0)), (s
qrt(a/b)*asinh(2**x*sqrt(b/a))/sqrt(a), (a > 0) & (b > 0)), (sqrt(-a/b)*aco
sh(2**x*sqrt(-b/a))/sqrt(-a), (b > 0) & (a < 0)))/log(2)
```

3.491 $\int \frac{2^x}{\sqrt{a-4^x b}} \, dx$

Optimal. Leaf size=32

$$\frac{\tan^{-1}\left(\frac{\sqrt{b}\,2^x}{\sqrt{a-b4^x}}\right)}{\sqrt{b}\log(2)}$$

```
[Out] arctan(2^x*b^(1/2)/(a-4^x*b)^(1/2))/ln(2)/b^(1/2)
```

Rubi [A] time = 0.04, antiderivative size = 32, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.188, Rules used = {2249, 217, 203}

$$\frac{\tan^{-1}\left(\frac{\sqrt{b}\,2^x}{\sqrt{a-b4^x}}\right)}{\sqrt{b}\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[2^x/Sqrt[a - 4^x*b],x]
```

```
[Out] ArcTan[(2^x*Sqrt[b])/Sqrt[a - 4^x*b]]/(Sqrt[b]*Log[2])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\int \frac{2^x}{\sqrt{a-4^x b}}\,dx = \frac{\text{Subst}\left(\int \frac{1}{\sqrt{a-bx^2}}\,dx, x, 2^x\right)}{\log(2)}$$
$$= \frac{\text{Subst}\left(\int \frac{1}{1+bx^2}\,dx, x, \frac{2^x}{\sqrt{a-4^x b}}\right)}{\log(2)}$$
$$= \frac{\tan^{-1}\left(\frac{2^x\sqrt{b}}{\sqrt{a-4^x b}}\right)}{\sqrt{b}\log(2)}$$

Mathematica [A] time = 0.01, size = 34, normalized size = 1.06

$$\frac{\tan^{-1}\left(\frac{\sqrt{b}\,2^x}{\sqrt{a-b2^{2x}}}\right)}{\sqrt{b}\log(2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^x/Sqrt[a - 4^x*b],x]
```

```
[Out] ArcTan[(2^x*Sqrt[b])/Sqrt[a - 2^(2*x)*b]]/(Sqrt[b]*Log[2])
```

fricas [A] time = 0.44, size = 92, normalized size = 2.88

$$\left[-\frac{\sqrt{-b}\log\left(-2\sqrt{-2^{2x}b+a}\,2^x\sqrt{-b}+2\cdot 2^{2x}b-a\right)}{2\,b\log(2)}, -\frac{\arctan\left(\frac{\sqrt{-2^{2x}b+a}\,2^x\sqrt{b}}{2^{2x}b-a}\right)}{\sqrt{b}\log(2)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a-4^x*b)^(1/2),x, algorithm="fricas")
```

```
[Out] [-1/2*sqrt(-b)*log(-2*sqrt(-2^(2*x)*b + a)*2^x*sqrt(-b) + 2*2^(2*x)*b - a)/
(b*log(2)), -arctan(sqrt(-2^(2*x)*b + a)*2^x*sqrt(b)/(2^(2*x)*b - a))/(sqrt
(b)*log(2))]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{2^x}{\sqrt{-4^x b+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a-4^x*b)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(2^x/sqrt(-4^x*b + a), x)
```

maple [F(-2)] time = 180.00, size = 0, normalized size = 0.00

$$\int \frac{2^{x}}{\sqrt{-b4^{x}+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a-b*4^x)^(1/2),x)
```

```
[Out] int(2^x/(a-b*4^x)^(1/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{2^{x}}{\sqrt{-4^{x}b+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a-4^x*b)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(2^x/sqrt(-4^x*b + a), x)
```

mupad [B] time = 3.77, size = 33, normalized size = 1.03

$$\frac{\ln\left(\sqrt{a-2^{2\,x}\,b}+2^{x}\,\sqrt{-b}\right)}{\sqrt{-b}\,\ln(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a - 4^x*b)^(1/2),x)
```

```
[Out] log((a - 2^(2*x)*b)^(1/2) + 2^x*(-b)^(1/2))/((-b)^(1/2)*log(2))
```

sympy [A] time = 0.86, size = 82, normalized size = 2.56

$$\frac{\begin{cases} \frac{\sqrt{\frac{a}{b}}\,\operatorname{asin}\left(2^{x}\sqrt{\frac{b}{a}}\right)}{\sqrt{a}} & \text{for } a>0 \wedge b>0 \\ \frac{\sqrt{-\frac{a}{b}}\,\operatorname{asinh}\left(2^{x}\sqrt{-\frac{b}{a}}\right)}{\sqrt{a}} & \text{for } a>0 \wedge b<0 \\ \frac{\sqrt{\frac{a}{b}}\,\operatorname{acosh}\left(2^{x}\sqrt{\frac{b}{a}}\right)}{\sqrt{-a}} & \text{for } a<0 \wedge b<0 \end{cases}}{\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**x/(a-4**x*b)**(1/2),x)
```

```
[Out] Piecewise((sqrt(a/b)*asin(2**x*sqrt(b/a))/sqrt(a), (a > 0) & (b > 0)), (sqr
t(-a/b)*asinh(2**x*sqrt(-b/a))/sqrt(a), (a > 0) & (b < 0)), (sqrt(a/b)*acos
h(2**x*sqrt(b/a))/sqrt(-a), (a < 0) & (b < 0)))/log(2)
```

3.492 $\int \frac{2^x}{\sqrt{a-2^{2x}b}}\,dx$

Optimal. Leaf size=32

$$\frac{\tan^{-1}\left(\frac{\sqrt{b}\,2^x}{\sqrt{a-b4^x}}\right)}{\sqrt{b}\,\log(2)}$$

```
[Out] arctan(2^x*b^(1/2)/(a-4^x*b)^(1/2))/ln(2)/b^(1/2)
```

Rubi [A] time = 0.04, antiderivative size = 32, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {2249, 217, 203}

$$\frac{\tan^{-1}\left(\frac{\sqrt{b}\,2^x}{\sqrt{a-b4^x}}\right)}{\sqrt{b}\,\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[2^x/Sqrt[a - 2^(2*x)*b],x]
```

```
[Out] ArcTan[(2^x*Sqrt[b])/Sqrt[a - 4^x*b]]/(Sqrt[b]*Log[2])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\int \frac{2^x}{\sqrt{a-2^{2x}b}}\,dx = \frac{\text{Subst}\left(\int \frac{1}{\sqrt{a-bx^2}}\,dx, x, 2^x\right)}{\log(2)}$$
$$= \frac{\text{Subst}\left(\int \frac{1}{1+bx^2}\,dx, x, \frac{2^x}{\sqrt{a-4^x b}}\right)}{\log(2)}$$
$$= \frac{\tan^{-1}\left(\frac{2^x\sqrt{b}}{\sqrt{a-4^x b}}\right)}{\sqrt{b}\log(2)}$$

Mathematica [A] time = 0.00, size = 34, normalized size = 1.06

$$\frac{\tan^{-1}\left(\frac{\sqrt{b}\,2^x}{\sqrt{a-b2^{2x}}}\right)}{\sqrt{b}\log(2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^x/Sqrt[a - 2^(2*x)*b],x]
```

```
[Out] ArcTan[(2^x*Sqrt[b])/Sqrt[a - 2^(2*x)*b]]/(Sqrt[b]*Log[2])
```

fricas [A] time = 0.46, size = 92, normalized size = 2.88

$$\left[-\frac{\sqrt{-b}\log\left(-2\sqrt{-2^{2x}b+a}\,2^x\sqrt{-b}+2\cdot 2^{2x}b-a\right)}{2\,b\log(2)}, -\frac{\arctan\left(\frac{\sqrt{-2^{2x}b+a}\,2^x\sqrt{b}}{2^{2x}b-a}\right)}{\sqrt{b}\log(2)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a-2^(2*x)*b)^(1/2),x, algorithm="fricas")
```

```
[Out] [-1/2*sqrt(-b)*log(-2*sqrt(-2^(2*x)*b + a)*2^x*sqrt(-b) + 2*2^(2*x)*b - a)/
(b*log(2)), -arctan(sqrt(-2^(2*x)*b + a)*2^x*sqrt(b)/(2^(2*x)*b - a))/(sqrt
(b)*log(2))]
```

giac [A] time = 0.61, size = 36, normalized size = 1.12

$$-\frac{\log\left(\left|-2^x\sqrt{-b}+\sqrt{-2^{2x}b+a}\right|\right)}{\sqrt{-b}\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a-2^(2*x)*b)^(1/2),x, algorithm="giac")
[Out] -log(abs(-2^x*sqrt(-b) + sqrt(-2^(2*x)*b + a)))/(sqrt(-b)*log(2))
```

maple [**F(-2)**] time = 180.00, size = 0, normalized size = 0.00

$$\int \frac{2^x}{\sqrt{-b2^{2x}+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a-b*2^(2*x))^(1/2),x)
[Out] int(2^x/(a-b*2^(2*x))^(1/2),x)
```

maxima [**A**] time = 1.88, size = 22, normalized size = 0.69

$$\frac{\arcsin\left(\frac{2^{x+1}b}{2\sqrt{ab}}\right)}{\sqrt{b}\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a-2^(2*x)*b)^(1/2),x, algorithm="maxima")
[Out] arcsin(1/2*2^(x + 1)*b/sqrt(a*b))/(sqrt(b)*log(2))
```

mupad [**B**] time = 3.63, size = 33, normalized size = 1.03

$$\frac{\ln\left(\sqrt{a-2^{2x}b}+2^x\sqrt{-b}\right)}{\sqrt{-b}\,\ln(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a - 2^(2*x)*b)^(1/2),x)
[Out] log((a - 2^(2*x)*b)^(1/2) + 2^x*(-b)^(1/2))/((-b)^(1/2)*log(2))
```

sympy [A] time = 0.97, size = 82, normalized size = 2.56

$$\frac{\begin{cases} \frac{\sqrt{\frac{a}{b}}\operatorname{asin}\left(2^{x}\sqrt{\frac{b}{a}}\right)}{\sqrt{a}} & \text{for } a > 0 \wedge b > 0 \\ \frac{\sqrt{-\frac{a}{b}}\operatorname{asinh}\left(2^{x}\sqrt{-\frac{b}{a}}\right)}{\sqrt{a}} & \text{for } a > 0 \wedge b < 0 \\ \frac{\sqrt{\frac{a}{b}}\operatorname{acosh}\left(2^{x}\sqrt{\frac{b}{a}}\right)}{\sqrt{-a}} & \text{for } a < 0 \wedge b < 0 \end{cases}}{\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**x/(a-2**(2*x)*b)**(1/2),x)
```

```
[Out] Piecewise((sqrt(a/b)*asin(2**x*sqrt(b/a))/sqrt(a), (a > 0) & (b > 0)), (sqr
t(-a/b)*asinh(2**x*sqrt(-b/a))/sqrt(a), (a > 0) & (b < 0)), (sqrt(a/b)*acos
h(2**x*sqrt(b/a))/sqrt(-a), (a < 0) & (b < 0)))/log(2)
```

3.493 $\int \frac{2^x}{\sqrt{a+4^{-x}b}}\,dx$

Optimal. Leaf size=24

$$\frac{2^x\sqrt{a+b2^{-2x}}}{a\log(2)}$$

[Out] 2^x*(a+b/(2^(2*x)))^(1/2)/a/ln(2)

Rubi [A] time = 0.05, antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118, Rules used = {2249, 191}

$$\frac{2^x\sqrt{a+b2^{-2x}}}{a\log(2)}$$

Antiderivative was successfully verified.

[In] Int[2^x/Sqrt[a + b/4^x],x]

[Out] (2^x*Sqrt[a + b/2^(2*x)])/(a*Log[2])

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\int \frac{2^x}{\sqrt{a+4^{-x}b}}\,dx = \frac{\text{Subst}\left(\int \frac{1}{\sqrt{a+\frac{b}{x^2}}}\,dx, x, 2^x\right)}{\log(2)}$$
$$= \frac{2^x\sqrt{a+2^{-2x}b}}{a\log(2)}$$

Mathematica [A] time = 0.03, size = 35, normalized size = 1.46

$$\frac{2^{-x}\left(a2^{2x}+b\right)}{a\log(2)\sqrt{a+b2^{-2x}}}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^x/Sqrt[a + b/4^x],x]
[Out] (2^(2*x)*a + b)/(2^x*a*Sqrt[a + b/2^(2*x)]*Log[2])
```

fricas [A] time = 0.44, size = 30, normalized size = 1.25

$$\frac{2^x\sqrt{\frac{2^{2x}a+b}{2^{2x}}}}{a\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a+b/(4^x))^(1/2),x, algorithm="fricas")
[Out] 2^x*sqrt((2^(2*x)*a + b)/2^(2*x))/(a*log(2))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{2^x}{\sqrt{a+\frac{b}{4^x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a+b/(4^x))^(1/2),x, algorithm="giac")
[Out] integrate(2^x/sqrt(a + b/4^x), x)
```

maple [A] time = 0.05, size = 40, normalized size = 1.67

$$\frac{\left(a2^{2x}+b\right)2^{-x}}{\sqrt{\left(a2^{2x}+b\right)2^{-2x}}\ \ln(2)a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a+b/(4^x))^(1/2),x)
```

```
[Out] 1/((a*(2^x)^2+b)/(2^x)^2)^(1/2)*(a*(2^x)^2+b)/(2^x)/a/ln(2)
```

maxima [A] time = 2.49, size = 19, normalized size = 0.79

$$\frac{\sqrt{2^{2x}a+b}}{a\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a+b/(4^x))^(1/2),x, algorithm="maxima")
```

```
[Out] sqrt(2^(2*x)*a + b)/(a*log(2))
```

mupad [B] time = 3.51, size = 24, normalized size = 1.00

$$\frac{2^x\sqrt{a+\frac{b}{2^{2x}}}}{a\ \ln(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a + b/4^x)^(1/2),x)
```

```
[Out] (2^x*(a + b/2^(2*x))^(1/2))/(a*log(2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{2^x}{\sqrt{a+4^{-x}b}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**x/(a+b/(4**x))**(1/2),x)
```

```
[Out] Integral(2**x/sqrt(a + 4**(-x)*b), x)
```

3.494 $\int \frac{2^x}{\sqrt{a+2^{-2x}b}}\,dx$

Optimal. Leaf size=24

$$\frac{2^x\sqrt{a+b2^{-2x}}}{a\log(2)}$$

```
[Out] 2^x*(a+b/(2^(2*x)))^(1/2)/a/ln(2)
```

Rubi [A] time = 0.05, antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118, Rules used = {2249, 191}

$$\frac{2^x\sqrt{a+b2^{-2x}}}{a\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[2^x/Sqrt[a + b/2^(2*x)],x]
```

```
[Out] (2^x*Sqrt[a + b/2^(2*x)])/(a*Log[2])
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\int \frac{2^x}{\sqrt{a+2^{-2x}b}}\,dx = \frac{\text{Subst}\left(\int \frac{1}{\sqrt{a+\frac{b}{x^2}}}\,dx, x, 2^x\right)}{\log(2)}$$
$$= \frac{2^x\sqrt{a+2^{-2x}b}}{a\log(2)}$$

Mathematica [A] time = 0.01, size = 35, normalized size = 1.46

$$\frac{2^{-x}\left(a2^{2x}+b\right)}{a\log(2)\sqrt{a+b2^{-2x}}}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^x/Sqrt[a + b/2^(2*x)],x]
[Out] (2^(2*x)*a + b)/(2^x*a*Sqrt[a + b/2^(2*x)]*Log[2])
```

fricas [A] time = 0.43, size = 30, normalized size = 1.25

$$\frac{2^x\sqrt{\frac{2^{2x}a+b}{2^{2x}}}}{a\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a+b/(2^(2*x)))^(1/2),x, algorithm="fricas")
[Out] 2^x*sqrt((2^(2*x)*a + b)/2^(2*x))/(a*log(2))
```

giac [A] time = 0.43, size = 29, normalized size = 1.21

$$\frac{\frac{\sqrt{2^{2x}a+b}}{a}-\frac{\sqrt{b}}{a}}{\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a+b/(2^(2*x)))^(1/2),x, algorithm="giac")
[Out] (sqrt(2^(2*x)*a + b)/a - sqrt(b)/a)/log(2)
```

maple [A] time = 0.02, size = 40, normalized size = 1.67

$$\frac{\left(a2^{2x}+b\right)2^{-x}}{\sqrt{\left(a2^{2x}+b\right)2^{-2x}}\,\ln(2)a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a+b/(2^(2*x)))^(1/2),x)
```

```
[Out] 1/((a*(2^x)^2+b)/(2^x)^2)^(1/2)*(a*(2^x)^2+b)/(2^x)/a/ln(2)
```

maxima [A] time = 0.60, size = 24, normalized size = 1.00

$$\frac{2^x\sqrt{a+\frac{b}{2^{2x}}}}{a\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a+b/(2^(2*x)))^(1/2),x, algorithm="maxima")
```

```
[Out] 2^x*sqrt(a + b/2^(2*x))/(a*log(2))
```

mupad [B] time = 3.55, size = 24, normalized size = 1.00

$$\frac{2^x\,\sqrt{a+\frac{b}{2^{2x}}}}{a\,\ln(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a + b/2^(2*x))^(1/2),x)
```

```
[Out] (2^x*(a + b/2^(2*x))^(1/2))/(a*log(2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{2^x}{\sqrt{a+2^{-2x}b}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**x/(a+b/(2**(2*x)))**(1/2),x)
```

```
[Out] Integral(2**x/sqrt(a + 2**(-2*x)*b), x)
```

3.495 $\int \frac{2^x}{\sqrt{a-4^{-x}b}}\,dx$

Optimal. Leaf size=25

$$\frac{2^x\sqrt{a-b2^{-2x}}}{a\log(2)}$$

[Out] 2^x*(a-b/(2^(2*x)))^(1/2)/a/ln(2)

Rubi [A] time = 0.05, antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2249, 191}

$$\frac{2^x\sqrt{a-b2^{-2x}}}{a\log(2)}$$

Antiderivative was successfully verified.

[In] Int[2^x/Sqrt[a - b/4^x],x]

[Out] (2^x*Sqrt[a - b/2^(2*x)])/(a*Log[2])

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\int \frac{2^x}{\sqrt{a-4^{-x}b}}\,dx = \frac{\text{Subst}\left(\int \frac{1}{\sqrt{a-\frac{b}{x^2}}}\,dx, x, 2^x\right)}{\log(2)}$$
$$= \frac{2^x\sqrt{a-2^{-2x}b}}{a\log(2)}$$

Mathematica [A] time = 0.03, size = 38, normalized size = 1.52

$$\frac{2^{-x}\left(a2^{2x}-b\right)}{a\log(2)\sqrt{a-b2^{-2x}}}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^x/Sqrt[a - b/4^x],x]
[Out] (2^(2*x)*a - b)/(2^x*a*Sqrt[a - b/2^(2*x)]*Log[2])
```

fricas [A] time = 0.43, size = 32, normalized size = 1.28

$$\frac{2^x\sqrt{\frac{2^{2x}a-b}{2^{2x}}}}{a\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a-b/(4^x))^(1/2),x, algorithm="fricas")
[Out] 2^x*sqrt((2^(2*x)*a - b)/2^(2*x))/(a*log(2))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{2^x}{\sqrt{a-\frac{b}{4^x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a-b/(4^x))^(1/2),x, algorithm="giac")
[Out] integrate(2^x/sqrt(a - b/4^x), x)
```

maple [A] time = 0.04, size = 44, normalized size = 1.76

$$\frac{\left(a 2^{2x}-b\right) 2^{-x}}{\sqrt{\left(a 2^{2x}-b\right) 2^{-2x}}\, \ln(2) a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a-b/(4^x))^(1/2),x)
```

```
[Out] 1/((a*(2^x)^2-b)/(2^x)^2)^(1/2)*(a*(2^x)^2-b)/(2^x)/a/ln(2)
```

maxima [A] time = 2.03, size = 21, normalized size = 0.84

$$\frac{\sqrt{2^{2x} a-b}}{a \log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a-b/(4^x))^(1/2),x, algorithm="maxima")
```

```
[Out] sqrt(2^(2*x)*a - b)/(a*log(2))
```

mupad [B] time = 3.56, size = 25, normalized size = 1.00

$$\frac{2^x \sqrt{a-\frac{b}{2^{2x}}}}{a \ln(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a - b/4^x)^(1/2),x)
```

```
[Out] (2^x*(a - b/2^(2*x))^(1/2))/(a*log(2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{2^x}{\sqrt{a-4^{-x} b}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**x/(a-b/(4**x))**(1/2),x)
```

```
[Out] Integral(2**x/sqrt(a - 4**(-x)*b), x)
```

3.496 $\int \frac{2^x}{\sqrt{a-2^{-2x}b}}\,dx$

Optimal. Leaf size=25

$$\frac{2^x\sqrt{a-b2^{-2x}}}{a\log(2)}$$

```
[Out] 2^x*(a-b/(2^(2*x)))^(1/2)/a/ln(2)
```

Rubi [A] time = 0.05, antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2249, 191}

$$\frac{2^x\sqrt{a-b2^{-2x}}}{a\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[2^x/Sqrt[a - b/2^(2*x)],x]
```

```
[Out] (2^x*Sqrt[a - b/2^(2*x)])/(a*Log[2])
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\int \frac{2^x}{\sqrt{a-2^{-2x}b}}\,dx = \frac{\text{Subst}\left(\int \frac{1}{\sqrt{a-\frac{b}{x^2}}}\,dx, x, 2^x\right)}{\log(2)}$$
$$= \frac{2^x\sqrt{a-2^{-2x}b}}{a\log(2)}$$

Mathematica [A] time = 0.01, size = 38, normalized size = 1.52

$$\frac{2^{-x}\left(a2^{2x}-b\right)}{a\log(2)\sqrt{a-b2^{-2x}}}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^x/Sqrt[a - b/2^(2*x)],x]
[Out] (2^(2*x)*a - b)/(2^x*a*Sqrt[a - b/2^(2*x)]*Log[2])
```

fricas [A] time = 0.42, size = 32, normalized size = 1.28

$$\frac{2^x\sqrt{\frac{2^{2x}a-b}{2^{2x}}}}{a\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a-b/(2^(2*x)))^(1/2),x, algorithm="fricas")
[Out] 2^x*sqrt((2^(2*x)*a - b)/2^(2*x))/(a*log(2))
```

giac [A] time = 0.41, size = 33, normalized size = 1.32

$$\frac{\frac{\sqrt{2^{2x}a-b}}{a}-\frac{\sqrt{-b}}{a}}{\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a-b/(2^(2*x)))^(1/2),x, algorithm="giac")
[Out] (sqrt(2^(2*x)*a - b)/a - sqrt(-b)/a)/log(2)
```

maple [A] time = 0.02, size = 44, normalized size = 1.76

$$\frac{\left(a 2^{2x}-b\right) 2^{-x}}{\sqrt{\left(a 2^{2x}-b\right) 2^{-2x}}\, \ln(2) a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a-b/(2^(2*x)))^(1/2),x)
```

```
[Out] 1/((a*(2^x)^2-b)/(2^x)^2)^(1/2)*(a*(2^x)^2-b)/(2^x)/a/ln(2)
```

maxima [A] time = 1.16, size = 25, normalized size = 1.00

$$\frac{2^{x} \sqrt{a-\frac{b}{2^{2x}}}}{a \log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^x/(a-b/(2^(2*x)))^(1/2),x, algorithm="maxima")
```

```
[Out] 2^x*sqrt(a - b/2^(2*x))/(a*log(2))
```

mupad [B] time = 3.51, size = 25, normalized size = 1.00

$$\frac{2^{x} \sqrt{a-\frac{b}{2^{2x}}}}{a \ln(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^x/(a - b/2^(2*x))^(1/2),x)
```

```
[Out] (2^x*(a - b/2^(2*x))^(1/2))/(a*log(2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{2^{x}}{\sqrt{a-2^{-2x} b}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**x/(a-b/(2**(2*x)))**(1/2),x)
```

```
[Out] Integral(2**x/sqrt(a - 2**(-2*x)*b), x)
```

3.497 $\int \frac{4^x}{\sqrt{a+2^x b}}\,dx$

Optimal. Leaf size=44

$$\frac{2\left(a+b2^x\right)^{3/2}}{3b^2\log(2)}-\frac{2a\sqrt{a+b2^x}}{b^2\log(2)}$$

[Out] 2/3*(a+2^x*b)^(3/2)/b^2/ln(2)-2*a*(a+2^x*b)^(1/2)/b^2/ln(2)

Rubi [A] time = 0.04, antiderivative size = 44, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {2248, 43}

$$\frac{2\left(a+b2^x\right)^{3/2}}{3b^2\log(2)}-\frac{2a\sqrt{a+b2^x}}{b^2\log(2)}$$

Antiderivative was successfully verified.

[In] Int[4^x/Sqrt[a + 2^x*b],x]

[Out] (-2*a*Sqrt[a + 2^x*b])/(b^2*Log[2]) + (2*(a + 2^x*b)^(3/2))/(3*b^2*Log[2])

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2248

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(g*h*Log[G])/(d*e*Lo
g[F])]}, Dist[(Denominator[m]*G^(f*h - (c*g*h)/d))/(d*e*Log[F]), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^((e*(c + d*x))/De
nominator[m])], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int \frac{4^x}{\sqrt{a+2^x b}}\,dx = \frac{\text{Subst}\left(\int \frac{x}{\sqrt{a+bx}}\,dx, x, 2^x\right)}{\log(2)}$$
$$= \frac{\text{Subst}\left(\int \left(-\frac{a}{b\sqrt{a+bx}} + \frac{\sqrt{a+bx}}{b}\right) dx, x, 2^x\right)}{\log(2)}$$
$$= -\frac{2a\sqrt{a+2^x b}}{b^2\log(2)} + \frac{2(a+2^x b)^{3/2}}{3b^2\log(2)}$$

Mathematica [A] time = 0.02, size = 29, normalized size = 0.66

$$\frac{2(b2^x-2a)\sqrt{a+b2^x}}{b^2\log(8)}$$

Antiderivative was successfully verified.

```
[In] Integrate[4^x/Sqrt[a + 2^x*b],x]
[Out] (2*(-2*a + 2^x*b)*Sqrt[a + 2^x*b])/(b^2*Log[8])
```

fricas [A] time = 0.41, size = 27, normalized size = 0.61

$$\frac{2\sqrt{2^x b+a}\,(2^x b-2a)}{3\,b^2\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4^x/(a+2^x*b)^(1/2),x, algorithm="fricas")
[Out] 2/3*sqrt(2^x*b + a)*(2^x*b - 2*a)/(b^2*log(2))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{4^x}{\sqrt{2^x b+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4^x/(a+2^x*b)^(1/2),x, algorithm="giac")
[Out] integrate(4^x/sqrt(2^x*b + a), x)
```

maple [A] time = 0.03, size = 29, normalized size = 0.66

$$-\frac{2\left(-b2^{x}+2a\right)\sqrt{b2^{x}+a}}{3\ln(2)b^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(4^x/(a+2^x*b)^(1/2),x)
```

```
[Out] -2/3*(-2^x*b+2*a)*(a+2^x*b)^(1/2)/b^2/ln(2)
```

maxima [A] time = 1.79, size = 68, normalized size = 1.55

$$\frac{2^{2\,x+1}}{3\,\sqrt{2^{x}b+a}\,\log(2)}-\frac{2^{x+1}a}{3\,\sqrt{2^{x}b+a}\,b\log(2)}-\frac{4\,a^{2}}{3\,\sqrt{2^{x}b+a}\,b^{2}\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4^x/(a+2^x*b)^(1/2),x, algorithm="maxima")
```

```
[Out] 1/3*2^(2*x + 1)/(sqrt(2^x*b + a)*log(2)) - 1/3*2^(x + 1)*a/(sqrt(2^x*b + a)
*b*log(2)) - 4/3*a^2/(sqrt(2^x*b + a)*b^2*log(2))
```

mupad [B] time = 3.68, size = 28, normalized size = 0.64

$$-\frac{2\,\sqrt{a+2^{x}\,b}\,\left(2\,a-2^{x}\,b\right)}{3\,b^{2}\,\ln(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(4^x/(a + 2^x*b)^(1/2),x)
```

```
[Out] -(2*(a + 2^x*b)^(1/2)*(2*a - 2^x*b))/(3*b^2*log(2))
```

sympy [A] time = 0.97, size = 56, normalized size = 1.27

$$\begin{cases} \frac{2\cdot 2^{x}\sqrt{2^{x}b+a}}{3b\log(2)}-\frac{4a\sqrt{2^{x}b+a}}{3b^{2}\log(2)} & \text{for } b\neq 0 \\ \frac{4^{x}}{2\sqrt{a}\,\log(2)} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4**x/(a+2**x*b)**(1/2),x)
```

```
[Out] Piecewise((2*2**x*sqrt(2**x*b + a)/(3*b*log(2)) - 4*a*sqrt(2**x*b + a)/(3*b
**2*log(2)), Ne(b, 0)), (4**x/(2*sqrt(a)*log(2)), True))
```

3.498 $\int \frac{2^{2x}}{\sqrt{a+2^x b}}\,dx$

Optimal. Leaf size=44

$$\frac{2\left(a+b2^x\right)^{3/2}}{3b^2\log(2)}-\frac{2a\sqrt{a+b2^x}}{b^2\log(2)}$$

```
[Out] 2/3*(a+2^x*b)^(3/2)/b^2/ln(2)-2*a*(a+2^x*b)^(1/2)/b^2/ln(2)
```

Rubi [A] time = 0.04, antiderivative size = 44, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118, Rules used = {2248, 43}

$$\frac{2\left(a+b2^x\right)^{3/2}}{3b^2\log(2)}-\frac{2a\sqrt{a+b2^x}}{b^2\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[2^(2*x)/Sqrt[a + 2^x*b],x]
```

```
[Out] (-2*a*Sqrt[a + 2^x*b])/(b^2*Log[2]) + (2*(a + 2^x*b)^(3/2))/(3*b^2*Log[2])
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2248

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(g*h*Log[G])/(d*e*Lo
g[F])]}, Dist[(Denominator[m]*G^(f*h - (c*g*h)/d))/(d*e*Log[F]), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^((e*(c + d*x))/De
nominator[m])], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int \frac{2^{2x}}{\sqrt{a+2^x b}}\,dx = \frac{\text{Subst}\left(\int \frac{x}{\sqrt{a+bx}}\,dx, x, 2^x\right)}{\log(2)}$$
$$= \frac{\text{Subst}\left(\int \left(-\frac{a}{b\sqrt{a+bx}} + \frac{\sqrt{a+bx}}{b}\right)dx, x, 2^x\right)}{\log(2)}$$
$$= -\frac{2a\sqrt{a+2^x b}}{b^2\log(2)} + \frac{2\left(a+2^x b\right)^{3/2}}{3b^2\log(2)}$$

Mathematica [A] time = 0.01, size = 29, normalized size = 0.66

$$\frac{2\left(b2^x-2a\right)\sqrt{a+b2^x}}{b^2\log(8)}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^(2*x)/Sqrt[a + 2^x*b],x]
[Out] (2*(-2*a + 2^x*b)*Sqrt[a + 2^x*b])/(b^2*Log[8])
```

fricas [A] time = 0.45, size = 27, normalized size = 0.61

$$\frac{2\sqrt{2^x b + a}\left(2^x b - 2\,a\right)}{3\,b^2\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(2*x)/(a+2^x*b)^(1/2),x, algorithm="fricas")
[Out] 2/3*sqrt(2^x*b + a)*(2^x*b - 2*a)/(b^2*log(2))
```

giac [A] time = 0.28, size = 31, normalized size = 0.70

$$\frac{2\left(\left(2^x b + a\right)^{\frac{3}{2}} - 3\sqrt{2^x b + a}\,a\right)}{3\,b^2\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(2*x)/(a+2^x*b)^(1/2),x, algorithm="giac")
[Out] 2/3*((2^x*b + a)^(3/2) - 3*sqrt(2^x*b + a)*a)/(b^2*log(2))
```

maple [A] time = 0.01, size = 29, normalized size = 0.66

$$-\frac{2\left(-b 2^{x}+2 a\right) \sqrt{b 2^{x}+a}}{3 \ln(2) b^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^(2*x)/(b*2^x+a)^(1/2),x)
[Out] -2/3*(-b*2^x+2*a)*(b*2^x+a)^(1/2)/ln(2)/b^2
```

maxima [A] time = 0.83, size = 38, normalized size = 0.86

$$\frac{2\left(2^{x} b+a\right)^{\frac{3}{2}}}{3 b^{2} \log(2)}-\frac{2 \sqrt{2^{x} b+a}\, a}{b^{2} \log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(2*x)/(a+2^x*b)^(1/2),x, algorithm="maxima")
[Out] 2/3*(2^x*b + a)^(3/2)/(b^2*log(2)) - 2*sqrt(2^x*b + a)*a/(b^2*log(2))
```

mupad [B] time = 3.62, size = 28, normalized size = 0.64

$$-\frac{2 \sqrt{a+2^{x} b}\,\left(2 a-2^{x} b\right)}{3 b^{2}\, \ln(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^(2*x)/(a + 2^x*b)^(1/2),x)
[Out] -(2*(a + 2^x*b)^(1/2)*(2*a - 2^x*b))/(3*b^2*log(2))
```

sympy [A] time = 0.97, size = 58, normalized size = 1.32

$$\begin{cases} \frac{2 \cdot 2^{x} \sqrt{2^{x} b+a}}{3 b \log (2)}-\frac{4 a \sqrt{2^{x} b+a}}{3 b^{2} \log (2)} & \text{for}\ b \neq 0 \\ \frac{2^{2 x}}{2 \sqrt{a} \log (2)} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**(2*x)/(a+2**x*b)**(1/2),x)
[Out] Piecewise((2*2**x*sqrt(2**x*b + a)/(3*b*log(2)) - 4*a*sqrt(2**x*b + a)/(3*b
**2*log(2)), Ne(b, 0)), (2**(2*x)/(2*sqrt(a)*log(2)), True))
```

3.499 $\int \frac{4^x}{\sqrt{a-2^x b}}\,dx$

Optimal. Leaf size=46

$$\frac{2\left(a-b2^x\right)^{3/2}}{3b^2\log(2)}-\frac{2a\sqrt{a-b2^x}}{b^2\log(2)}$$

```
[Out] 2/3*(a-2^x*b)^(3/2)/b^2/ln(2)-2*a*(a-2^x*b)^(1/2)/b^2/ln(2)
```

Rubi [A] time = 0.04, antiderivative size = 46, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {2248, 43}

$$\frac{2\left(a-b2^x\right)^{3/2}}{3b^2\log(2)}-\frac{2a\sqrt{a-b2^x}}{b^2\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[4^x/Sqrt[a - 2^x*b],x]
```

```
[Out] (-2*a*Sqrt[a - 2^x*b])/(b^2*Log[2]) + (2*(a - 2^x*b)^(3/2))/(3*b^2*Log[2])
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2248

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(g*h*Log[G])/(d*e*Lo
g[F])]}, Dist[(Denominator[m]*G^(f*h - (c*g*h)/d))/(d*e*Log[F]), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^((e*(c + d*x))/De
nominator[m])], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int \frac{4^x}{\sqrt{a-2^x b}}\,dx = \frac{\text{Subst}\left(\int \frac{x}{\sqrt{a-bx}}\,dx, x, 2^x\right)}{\log(2)}$$
$$= \frac{\text{Subst}\left(\int \left(\frac{a}{b\sqrt{a-bx}} - \frac{\sqrt{a-bx}}{b}\right)dx, x, 2^x\right)}{\log(2)}$$
$$= -\frac{2a\sqrt{a-2^x b}}{b^2\log(2)} + \frac{2\left(a-2^x b\right)^{3/2}}{3b^2\log(2)}$$

Mathematica [**A**] time = 0.02, size = 30, normalized size = 0.65

$$-\frac{2\sqrt{a-b2^x}\,(2a+b2^x)}{b^2\log(8)}$$

Antiderivative was successfully verified.

```
[In] Integrate[4^x/Sqrt[a - 2^x*b],x]
[Out] (-2*Sqrt[a - 2^x*b]*(2*a + 2^x*b))/(b^2*Log[8])
```

fricas [**A**] time = 0.45, size = 28, normalized size = 0.61

$$-\frac{2\,(2^x b + 2\,a)\sqrt{-2^x b + a}}{3\,b^2\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4^x/(a-2^x*b)^(1/2),x, algorithm="fricas")
[Out] -2/3*(2^x*b + 2*a)*sqrt(-2^x*b + a)/(b^2*log(2))
```

giac [**F**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{4^x}{\sqrt{-2^x b + a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4^x/(a-2^x*b)^(1/2),x, algorithm="giac")
[Out] integrate(4^x/sqrt(-2^x*b + a), x)
```

maple [A] time = 0.03, size = 29, normalized size = 0.63

$$-\frac{2\,(b2^{x}+2a)\,\sqrt{-b2^{x}+a}}{3\ln(2)b^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(4^x/(a-b*2^x)^(1/2),x)
```

```
[Out] -2/3*(b*2^x+2*a)/b^2*(a-b*2^x)^(1/2)/ln(2)
```

maxima [A] time = 2.11, size = 71, normalized size = 1.54

$$\frac{2^{2\,x+1}}{3\,\sqrt{-2^{x}b+a}\,\log(2)}+\frac{2^{x+1}a}{3\,\sqrt{-2^{x}b+a}\,b\log(2)}-\frac{4\,a^{2}}{3\,\sqrt{-2^{x}b+a}\,b^{2}\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4^x/(a-2^x*b)^(1/2),x, algorithm="maxima")
```

```
[Out] 1/3*2^(2*x + 1)/(sqrt(-2^x*b + a)*log(2)) + 1/3*2^(x + 1)*a/(sqrt(-2^x*b +
a)*b*log(2)) - 4/3*a^2/(sqrt(-2^x*b + a)*b^2*log(2))
```

mupad [B] time = 3.64, size = 28, normalized size = 0.61

$$-\frac{2\,\sqrt{a-2^{x}\,b}\,\left(2\,a+2^{x}\,b\right)}{3\,b^{2}\,\ln(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(4^x/(a - 2^x*b)^(1/2),x)
```

```
[Out] -(2*(a - 2^x*b)^(1/2)*(2*a + 2^x*b))/(3*b^2*log(2))
```

sympy [A] time = 0.97, size = 58, normalized size = 1.26

$$\begin{cases} -\frac{2\cdot 2^{x}\sqrt{-2^{x}b+a}}{3b\log{(2)}}-\frac{4a\sqrt{-2^{x}b+a}}{3b^{2}\log{(2)}} & \text{for}\ b\neq 0\\ \frac{4^{x}}{2\sqrt{a}\log{(2)}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4**x/(a-2**x*b)**(1/2),x)
```

```
[Out] Piecewise((-2*2**x*sqrt(-2**x*b + a)/(3*b*log(2)) - 4*a*sqrt(-2**x*b + a)/(
3*b**2*log(2)), Ne(b, 0)), (4**x/(2*sqrt(a)*log(2)), True))
```

3.500 $\int \frac{2^{2x}}{\sqrt{a-2^x b}}\,dx$

Optimal. Leaf size=46

$$\frac{2(a-b2^x)^{3/2}}{3b^2\log(2)}-\frac{2a\sqrt{a-b2^x}}{b^2\log(2)}$$

```
[Out] 2/3*(a-2^x*b)^(3/2)/b^2/ln(2)-2*a*(a-2^x*b)^(1/2)/b^2/ln(2)
```

Rubi [A] time = 0.04, antiderivative size = 46, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2248, 43}

$$\frac{2(a-b2^x)^{3/2}}{3b^2\log(2)}-\frac{2a\sqrt{a-b2^x}}{b^2\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[2^(2*x)/Sqrt[a - 2^x*b],x]
```

```
[Out] (-2*a*Sqrt[a - 2^x*b])/(b^2*Log[2]) + (2*(a - 2^x*b)^(3/2))/(3*b^2*Log[2])
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2248

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(g*h*Log[G])/(d*e*Lo
g[F])]}, Dist[(Denominator[m]*G^(f*h - (c*g*h)/d))/(d*e*Log[F]), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^((e*(c + d*x))/De
nominator[m])], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int \frac{2^{2x}}{\sqrt{a-2^xb}}\,dx = \frac{\text{Subst}\left(\int \frac{x}{\sqrt{a-bx}}\,dx, x, 2^x\right)}{\log(2)}$$
$$= \frac{\text{Subst}\left(\int \left(\frac{a}{b\sqrt{a-bx}} - \frac{\sqrt{a-bx}}{b}\right) dx, x, 2^x\right)}{\log(2)}$$
$$= -\frac{2a\sqrt{a-2^xb}}{b^2\log(2)} + \frac{2\left(a-2^xb\right)^{3/2}}{3b^2\log(2)}$$

Mathematica [A] time = 0.01, size = 30, normalized size = 0.65

$$-\frac{2\sqrt{a-b2^x}\,\left(2a+b2^x\right)}{b^2\log(8)}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^(2*x)/Sqrt[a - 2^x*b],x]
[Out] (-2*Sqrt[a - 2^x*b]*(2*a + 2^x*b))/(b^2*Log[8])
```

fricas [A] time = 0.48, size = 28, normalized size = 0.61

$$-\frac{2\left(2^{x}b+2\,a\right)\sqrt{-2^{x}b+a}}{3\,b^{2}\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(2*x)/(a-2^x*b)^(1/2),x, algorithm="fricas")
[Out] -2/3*(2^x*b + 2*a)*sqrt(-2^x*b + a)/(b^2*log(2))
```

giac [A] time = 0.44, size = 33, normalized size = 0.72

$$\frac{2\left(\left(-2^{x}b+a\right)^{\frac{3}{2}}-3\sqrt{-2^{x}b+a}\,a\right)}{3\,b^{2}\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(2*x)/(a-2^x*b)^(1/2),x, algorithm="giac")
[Out] 2/3*((-2^x*b + a)^(3/2) - 3*sqrt(-2^x*b + a)*a)/(b^2*log(2))
```

maple [A] time = 0.01, size = 29, normalized size = 0.63

$$-\frac{2\left(b2^{x}+2a\right)\sqrt{-b2^{x}+a}}{3\ln(2)b^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^(2*x)/(-b*2^x+a)^(1/2),x)
```

```
[Out] -2/3*(b*2^x+2*a)*(-b*2^x+a)^(1/2)/ln(2)/b^2
```

maxima [A] time = 0.97, size = 40, normalized size = 0.87

$$\frac{2\left(-2^{x}b+a\right)^{\frac{3}{2}}}{3\,b^{2}\log(2)}-\frac{2\sqrt{-2^{x}b+a}\,a}{b^{2}\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(2*x)/(a-2^x*b)^(1/2),x, algorithm="maxima")
```

```
[Out] 2/3*(-2^x*b + a)^(3/2)/(b^2*log(2)) - 2*sqrt(-2^x*b + a)*a/(b^2*log(2))
```

mupad [B] time = 3.54, size = 28, normalized size = 0.61

$$-\frac{2\sqrt{a-2^{x}\,b}\,\left(2\,a+2^{x}\,b\right)}{3\,b^{2}\,\ln(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^(2*x)/(a - 2^x*b)^(1/2),x)
```

```
[Out] -(2*(a - 2^x*b)^(1/2)*(2*a + 2^x*b))/(3*b^2*log(2))
```

sympy [A] time = 0.98, size = 60, normalized size = 1.30

$$\begin{cases} -\frac{2\cdot 2^{x}\sqrt{-2^{x}b+a}}{3b\log{(2)}}-\frac{4a\sqrt{-2^{x}b+a}}{3b^{2}\log{(2)}} & \text{for}\ b\neq 0\\ \frac{2^{2x}}{2\sqrt{a}\,\log{(2)}} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**(2*x)/(a-2**x*b)**(1/2),x)
```

```
[Out] Piecewise((-2*2**x*sqrt(-2**x*b + a)/(3*b*log(2)) - 4*a*sqrt(-2**x*b + a)/(
3*b**2*log(2)), Ne(b, 0)), (2**(2*x)/(2*sqrt(a)*log(2)), True))
```

3.501 $\int \frac{4^x}{\sqrt{a+2^{-x}b}}\,dx$

Optimal. Leaf size=93

$$\frac{3b^2\tanh^{-1}\left(\frac{\sqrt{a+b2^{-x}}}{\sqrt{a}}\right)}{4a^{5/2}\log(2)}-\frac{3b2^{x-2}\sqrt{a+b2^{-x}}}{a^2\log(2)}+\frac{2^{2x-1}\sqrt{a+b2^{-x}}}{a\log(2)}$$

```
[Out] 3/4*b^2*arctanh((a+b/(2^x))^(1/2)/a^(1/2))/a^(5/2)/ln(2)+2^(-1+2*x)*(a+b/(2
^x))^(1/2)/a/ln(2)-3*2^(-2+x)*b*(a+b/(2^x))^(1/2)/a^2/ln(2)
```

Rubi [A] time = 0.07, antiderivative size = 93, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.235, Rules used = {2248, 51, 63, 208}

$$\frac{3b^2\tanh^{-1}\left(\frac{\sqrt{a+b2^{-x}}}{\sqrt{a}}\right)}{4a^{5/2}\log(2)}-\frac{3b2^{x-2}\sqrt{a+b2^{-x}}}{a^2\log(2)}+\frac{2^{2x-1}\sqrt{a+b2^{-x}}}{a\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[4^x/Sqrt[a + b/2^x],x]
```

```
[Out] (2^(-1 + 2*x)*Sqrt[a + b/2^x])/(a*Log[2]) - (3*2^(-2 + x)*b*Sqrt[a + b/2^x]
)/(a^2*Log[2]) + (3*b^2*ArcTanh[Sqrt[a + b/2^x]/Sqrt[a]])/(4*a^(5/2)*Log[2]
)
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2248

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(g*h*Log[G])/(d*e*Lo
g[F])]}, Dist[(Denominator[m]*G^(f*h - (c*g*h)/d))/(d*e*Log[F]), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^((e*(c + d*x))/De
nominator[m])], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{4^x}{\sqrt{a+2^{-x}b}}\,dx &= -\frac{\text{Subst}\left(\int \frac{1}{x^3\sqrt{a+bx}}\,dx, x, 2^{-x}\right)}{\log(2)}\\
&= \frac{2^{-1+2x}\sqrt{a+2^{-x}b}}{a\log(2)} + \frac{(3b)\,\text{Subst}\left(\int \frac{1}{x^2\sqrt{a+bx}}\,dx, x, 2^{-x}\right)}{4a\log(2)}\\
&= \frac{2^{-1+2x}\sqrt{a+2^{-x}b}}{a\log(2)} - \frac{3\,2^{-2+x}b\sqrt{a+2^{-x}b}}{a^2\log(2)} - \frac{\left(3b^2\right)\text{Subst}\left(\int \frac{1}{x\sqrt{a+bx}}\,dx, x, 2^{-x}\right)}{8a^2\log(2)}\\
&= \frac{2^{-1+2x}\sqrt{a+2^{-x}b}}{a\log(2)} - \frac{3\,2^{-2+x}b\sqrt{a+2^{-x}b}}{a^2\log(2)} - \frac{(3b)\,\text{Subst}\left(\int \frac{1}{-\frac{a}{b}+\frac{x^2}{b}}\,dx, x, \sqrt{a+2^{-x}b}\right)}{4a^2\log(2)}\\
&= \frac{2^{-1+2x}\sqrt{a+2^{-x}b}}{a\log(2)} - \frac{3\,2^{-2+x}b\sqrt{a+2^{-x}b}}{a^2\log(2)} + \frac{3b^2\tanh^{-1}\left(\frac{\sqrt{a+2^{-x}b}}{\sqrt{a}}\right)}{4a^{5/2}\log(2)}
\end{aligned}$$

Mathematica [A] time = 0.09, size = 111, normalized size = 1.19

$$\frac{2^{-\frac{x}{2}-2}\left(\sqrt{a}\,2^{x/2}\left(a^2 2^{2x+1}-ab2^x-3b^2\right)+3b^2\sqrt{a2^x+b}\,\tanh^{-1}\left(\frac{\sqrt{a}\,2^{x/2}}{\sqrt{a2^x+b}}\right)\right)}{a^{5/2}\log(2)\sqrt{a+b2^{-x}}}$$

Antiderivative was successfully verified.

```
[In] Integrate[4^x/Sqrt[a + b/2^x],x]
```

```
[Out] (2^(-2 - x/2)*(2^(x/2)*Sqrt[a]*(2^(1 + 2*x)*a^2 - 2^x*a*b - 3*b^2) + 3*b^2*
Sqrt[2^x*a + b]*ArcTanh[(2^(x/2)*Sqrt[a])/Sqrt[2^x*a + b]]))/(a^(5/2)*Sqrt[
a + b/2^x]*Log[2])
```

fricas [A] time = 0.43, size = 166, normalized size = 1.78

$$\left[\frac{3\sqrt{a}b^2\log\left(2\cdot 2^x a + 2\cdot 2^x\sqrt{a}\sqrt{\frac{2^x a+b}{2^x}} + b\right) + 2\left(2\cdot 2^{2x}a^2 - 3\cdot 2^x ab\right)\sqrt{\frac{2^x a+b}{2^x}}}{8a^3\log(2)}, -\frac{3\sqrt{-a}b^2\arctan\left(\frac{\sqrt{-a}\sqrt{\frac{2^x a+b}{2^x}}}{a}\right) - \cdots}{4a^3\log\cdots}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4^x/(a+b/(2^x))^(1/2),x, algorithm="fricas")
```

```
[Out] [1/8*(3*sqrt(a)*b^2*log(2*2^x*a + 2*2^x*sqrt(a)*sqrt((2^x*a + b)/2^x) + b)
+ 2*(2*2^(2*x)*a^2 - 3*2^x*a*b)*sqrt((2^x*a + b)/2^x))/(a^3*log(2)), -1/4*(
3*sqrt(-a)*b^2*arctan(sqrt(-a)*sqrt((2^x*a + b)/2^x)/a) - (2*2^(2*x)*a^2 -
3*2^x*a*b)*sqrt((2^x*a + b)/2^x))/(a^3*log(2))]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{4^x}{\sqrt{a + \frac{b}{2^x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4^x/(a+b/(2^x))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(4^x/sqrt(a + b/2^x), x)
```

maple [F] time = 0.04, size = 0, normalized size = 0.00

$$\int \frac{4^x}{\sqrt{b2^{-x} + a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(4^x/(a+b/(2^x))^(1/2),x)
```

```
[Out] int(4^x/(a+b/(2^x))^(1/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{4^x}{\sqrt{a + \frac{b}{2^x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4^x/(a+b/(2^x))^(1/2),x, algorithm="maxima")
[Out] integrate(4^x/sqrt(a + b/2^x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{4^x}{\sqrt{a+\frac{b}{2^x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(4^x/(a + b/2^x)^(1/2),x)
[Out] int(4^x/(a + b/2^x)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{4^x}{\sqrt{a+2^{-x}b}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4**x/(a+b/(2**x))**(1/2),x)
[Out] Integral(4**x/sqrt(a + 2**(-x)*b), x)
```

3.502 $\int \frac{2^{2x}}{\sqrt{a+2^{-x}b}}\,dx$

Optimal. Leaf size=93

$$\frac{3b^2\tanh^{-1}\left(\frac{\sqrt{a+b2^{-x}}}{\sqrt{a}}\right)}{4a^{5/2}\log(2)}-\frac{3b2^{x-2}\sqrt{a+b2^{-x}}}{a^2\log(2)}+\frac{2^{2x-1}\sqrt{a+b2^{-x}}}{a\log(2)}$$

```
[Out] 3/4*b^2*arctanh((a+b/(2^x))^(1/2)/a^(1/2))/a^(5/2)/ln(2)+2^(-1+2*x)*(a+b/(2
^x))^(1/2)/a/ln(2)-3*2^(-2+x)*b*(a+b/(2^x))^(1/2)/a^2/ln(2)
```

Rubi [A] time = 0.07, antiderivative size = 93, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.210, Rules used = {2248, 51, 63, 208}

$$\frac{3b^2\tanh^{-1}\left(\frac{\sqrt{a+b2^{-x}}}{\sqrt{a}}\right)}{4a^{5/2}\log(2)}-\frac{3b2^{x-2}\sqrt{a+b2^{-x}}}{a^2\log(2)}+\frac{2^{2x-1}\sqrt{a+b2^{-x}}}{a\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[2^(2*x)/Sqrt[a + b/2^x],x]
```

```
[Out] (2^(-1 + 2*x)*Sqrt[a + b/2^x])/(a*Log[2]) - (3*2^(-2 + x)*b*Sqrt[a + b/2^x]
)/(a^2*Log[2]) + (3*b^2*ArcTanh[Sqrt[a + b/2^x]/Sqrt[a]])/(4*a^(5/2)*Log[2]
)
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2248

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(g*h*Log[G])/(d*e*Lo
g[F])]}, Dist[(Denominator[m]*G^(f*h - (c*g*h)/d))/(d*e*Log[F]), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^((e*(c + d*x))/De
nominator[m])], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{2^{2x}}{\sqrt{a+2^{-x}b}}\,dx &= -\frac{\text{Subst}\left(\int \frac{1}{x^3\sqrt{a+bx}}\,dx,x,2^{-x}\right)}{\log(2)}\\
&= \frac{2^{-1+2x}\sqrt{a+2^{-x}b}}{a\log(2)}+\frac{(3b)\,\text{Subst}\left(\int \frac{1}{x^2\sqrt{a+bx}}\,dx,x,2^{-x}\right)}{4a\log(2)}\\
&= \frac{2^{-1+2x}\sqrt{a+2^{-x}b}}{a\log(2)}-\frac{3\,2^{-2+x}b\sqrt{a+2^{-x}b}}{a^2\log(2)}-\frac{\left(3b^2\right)\text{Subst}\left(\int \frac{1}{x\sqrt{a+bx}}\,dx,x,2^{-x}\right)}{8a^2\log(2)}\\
&= \frac{2^{-1+2x}\sqrt{a+2^{-x}b}}{a\log(2)}-\frac{3\,2^{-2+x}b\sqrt{a+2^{-x}b}}{a^2\log(2)}-\frac{(3b)\,\text{Subst}\left(\int \frac{1}{-\frac{a}{b}+\frac{x^2}{b}}\,dx,x,\sqrt{a+2^{-x}b}\right)}{4a^2\log(2)}\\
&= \frac{2^{-1+2x}\sqrt{a+2^{-x}b}}{a\log(2)}-\frac{3\,2^{-2+x}b\sqrt{a+2^{-x}b}}{a^2\log(2)}+\frac{3b^2\tanh^{-1}\left(\frac{\sqrt{a+2^{-x}b}}{\sqrt{a}}\right)}{4a^{5/2}\log(2)}
\end{aligned}$$

Mathematica [A] time = 0.04, size = 111, normalized size = 1.19

$$\frac{2^{-\frac{x}{2}-2}\left(\sqrt{a}\,2^{x/2}\left(a^2 2^{2x+1}-ab2^x-3b^2\right)+3b^2\sqrt{a2^x+b}\,\tanh^{-1}\left(\frac{\sqrt{a}\,2^{x/2}}{\sqrt{a2^x+b}}\right)\right)}{a^{5/2}\log(2)\sqrt{a+b2^{-x}}}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^(2*x)/Sqrt[a + b/2^x],x]
```

[Out] (2^(-2 - x/2)*(2^(x/2)*Sqrt[a]*(2^(1 + 2*x)*a^2 - 2^x*a*b - 3*b^2) + 3*b^2*Sqrt[2^x*a + b]*ArcTanh[(2^(x/2)*Sqrt[a])/Sqrt[2^x*a + b]]))/(a^(5/2)*Sqrt[a + b/2^x]*Log[2])

fricas [A] time = 0.43, size = 166, normalized size = 1.78

$$\left[\frac{3\,\sqrt{a}\,b^2\log\left(2\cdot 2^x a + 2\cdot 2^x\sqrt{a}\,\sqrt{\frac{2^x a+b}{2^x}} + b\right) + 2\left(2\cdot 2^{2\,x}a^2 - 3\cdot 2^x ab\right)\sqrt{\frac{2^x a+b}{2^x}}}{8\,a^3\log(2)}, -\frac{3\,\sqrt{-a}\,b^2\arctan\left(\frac{\sqrt{-a}\,\sqrt{\frac{2^x a+b}{2^x}}}{a}\right) - \cdots}{4\,a^3\log\cdots}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(2^(2*x)/(a+b/(2^x))^(1/2),x, algorithm="fricas")

[Out] [1/8*(3*sqrt(a)*b^2*log(2*2^x*a + 2*2^x*sqrt(a)*sqrt((2^x*a + b)/2^x) + b) + 2*(2*2^(2*x)*a^2 - 3*2^x*a*b)*sqrt((2^x*a + b)/2^x))/(a^3*log(2)), -1/4*(3*sqrt(-a)*b^2*arctan(sqrt(-a)*sqrt((2^x*a + b)/2^x)/a) - (2*2^(2*x)*a^2 - 3*2^x*a*b)*sqrt((2^x*a + b)/2^x))/(a^3*log(2))]

giac [A] time = 0.64, size = 94, normalized size = 1.01

$$\frac{2\,\sqrt{2^{2\,x}a + 2^x b}\left(\frac{2\cdot 2^x}{a} - \frac{3\,b}{a^2}\right) - \frac{3\,b^2\log\left(\left|-2\left(2^x\sqrt{a} - \sqrt{2^{2\,x}a+2^x b}\right)\sqrt{a} - b\right|\right)}{a^{\frac{5}{2}}} + \frac{3\,b^2\log\left(|b|\right)}{a^{\frac{5}{2}}}}{8\,\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(2^(2*x)/(a+b/(2^x))^(1/2),x, algorithm="giac")

[Out] 1/8*(2*sqrt(2^(2*x)*a + 2^x*b)*(2*2^x/a - 3*b/a^2) - 3*b^2*log(abs(-2*(2^x*sqrt(a) - sqrt(2^(2*x)*a + 2^x*b))*sqrt(a) - b))/a^(5/2) + 3*b^2*log(abs(b))/a^(5/2))/log(2)

maple [F] time = 0.02, size = 0, normalized size = 0.00

$$\int \frac{2^{2x}}{\sqrt{b2^{-x} + a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(2^(2*x)/(a+b/(2^x))^(1/2),x)

[Out] int(2^(2*x)/(a+b/(2^x))^(1/2),x)

maxima [A] time = 2.04, size = 124, normalized size = 1.33

$$-\frac{3\,b^2\log\left(\frac{\sqrt{a+\frac{b}{2^x}}-\sqrt{a}}{\sqrt{a+\frac{b}{2^x}}+\sqrt{a}}\right)}{8\,a^{\frac{5}{2}}\log(2)}-\frac{3\left(a+\frac{b}{2^x}\right)^{\frac{3}{2}}b^2-5\sqrt{a+\frac{b}{2^x}}\,ab^2}{4\left(\left(a+\frac{b}{2^x}\right)^2a^2-2\left(a+\frac{b}{2^x}\right)a^3+a^4\right)\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(2*x)/(a+b/(2^x))^(1/2),x, algorithm="maxima")
```

```
[Out] -3/8*b^2*log((sqrt(a + b/2^x) - sqrt(a))/(sqrt(a + b/2^x) + sqrt(a)))/(a^(5
/2)*log(2)) - 1/4*(3*(a + b/2^x)^(3/2)*b^2 - 5*sqrt(a + b/2^x)*a*b^2)/(((a
+ b/2^x)^2*a^2 - 2*(a + b/2^x)*a^3 + a^4)*log(2))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{2^{2\,x}}{\sqrt{a+\frac{b}{2^x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^(2*x)/(a + b/2^x)^(1/2),x)
```

```
[Out] int(2^(2*x)/(a + b/2^x)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{2^{2x}}{\sqrt{a+2^{-x}b}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**(2*x)/(a+b/(2**x))**(1/2),x)
```

```
[Out] Integral(2**(2*x)/sqrt(a + 2**(-x)*b), x)
```

3.503 $\int \frac{4^x}{\sqrt{a-2^{-x}b}}\,dx$

Optimal. Leaf size=96

$$\frac{3b^2\tanh^{-1}\left(\frac{\sqrt{a-b2^{-x}}}{\sqrt{a}}\right)}{4a^{5/2}\log(2)}+\frac{3b2^{x-2}\sqrt{a-b2^{-x}}}{a^2\log(2)}+\frac{2^{2x-1}\sqrt{a-b2^{-x}}}{a\log(2)}$$

```
[Out] 3/4*b^2*arctanh((a-b/(2^x))^(1/2)/a^(1/2))/a^(5/2)/ln(2)+2^(-1+2*x)*(a-b/(2
^x))^(1/2)/a/ln(2)+3*2^(-2+x)*b*(a-b/(2^x))^(1/2)/a^2/ln(2)
```

Rubi [A] time = 0.08, antiderivative size = 96, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {2248, 51, 63, 208}

$$\frac{3b^2\tanh^{-1}\left(\frac{\sqrt{a-b2^{-x}}}{\sqrt{a}}\right)}{4a^{5/2}\log(2)}+\frac{3b2^{x-2}\sqrt{a-b2^{-x}}}{a^2\log(2)}+\frac{2^{2x-1}\sqrt{a-b2^{-x}}}{a\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[4^x/Sqrt[a - b/2^x],x]
```

```
[Out] (2^(-1 + 2*x)*Sqrt[a - b/2^x])/(a*Log[2]) + (3*2^(-2 + x)*b*Sqrt[a - b/2^x]
)/(a^2*Log[2]) + (3*b^2*ArcTanh[Sqrt[a - b/2^x]/Sqrt[a]])/(4*a^(5/2)*Log[2]
)
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2248

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(g*h*Log[G])/(d*e*Lo
g[F])]}, Dist[(Denominator[m]*G^(f*h - (c*g*h)/d))/(d*e*Log[F]), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^((e*(c + d*x))/De
nominator[m])], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int \frac{4^x}{\sqrt{a-2^{-x}b}}\,dx = -\frac{\text{Subst}\left(\int \frac{1}{x^3\sqrt{a-bx}}\,dx, x, 2^{-x}\right)}{\log(2)}$$

$$= \frac{2^{-1+2x}\sqrt{a-2^{-x}b}}{a\log(2)} - \frac{(3b)\,\text{Subst}\left(\int \frac{1}{x^2\sqrt{a-bx}}\,dx, x, 2^{-x}\right)}{4a\log(2)}$$

$$= \frac{2^{-1+2x}\sqrt{a-2^{-x}b}}{a\log(2)} + \frac{3\,2^{-2+x}b\sqrt{a-2^{-x}b}}{a^2\log(2)} - \frac{\left(3b^2\right)\text{Subst}\left(\int \frac{1}{x\sqrt{a-bx}}\,dx, x, 2^{-x}\right)}{8a^2\log(2)}$$

$$= \frac{2^{-1+2x}\sqrt{a-2^{-x}b}}{a\log(2)} + \frac{3\,2^{-2+x}b\sqrt{a-2^{-x}b}}{a^2\log(2)} + \frac{(3b)\,\text{Subst}\left(\int \frac{1}{\frac{a}{b}-\frac{x^2}{b}}\,dx, x, \sqrt{a-2^{-x}b}\right)}{4a^2\log(2)}$$

$$= \frac{2^{-1+2x}\sqrt{a-2^{-x}b}}{a\log(2)} + \frac{3\,2^{-2+x}b\sqrt{a-2^{-x}b}}{a^2\log(2)} + \frac{3b^2\tanh^{-1}\left(\frac{\sqrt{a-2^{-x}b}}{\sqrt{a}}\right)}{4a^{5/2}\log(2)}$$

Mathematica [A] time = 0.08, size = 115, normalized size = 1.20

$$\frac{2^{-\frac{x}{2}-2}\left(\sqrt{a}\,2^{x/2}\left(a^2 2^{2x+1}+ab2^x-3b^2\right)+3b^2\sqrt{a2^x-b}\,\tanh^{-1}\left(\frac{\sqrt{a}\,2^{x/2}}{\sqrt{a2^x-b}}\right)\right)}{a^{5/2}\log(2)\sqrt{a-b2^{-x}}}$$

Antiderivative was successfully verified.

```
[In] Integrate[4^x/Sqrt[a - b/2^x],x]
```

```
[Out] (2^(-2 - x/2)*(2^(x/2)*Sqrt[a]*(2^(1 + 2*x)*a^2 + 2^x*a*b - 3*b^2) + 3*Sqrt
[2^x*a - b]*b^2*ArcTanh[(2^(x/2)*Sqrt[a])/Sqrt[2^x*a - b]]))/(a^(5/2)*Sqrt[
a - b/2^x]*Log[2])
```

fricas [A] time = 0.44, size = 174, normalized size = 1.81

$$\left[\frac{3\sqrt{a}\,b^2\log\left(-2\cdot 2^x a - 2\cdot 2^x\sqrt{a}\sqrt{\frac{2^x a-b}{2^x}} + b\right) + 2\left(2\cdot 2^{2x}a^2 + 3\cdot 2^x ab\right)\sqrt{\frac{2^x a-b}{2^x}}}{8\,a^3\log(2)}, -\frac{3\sqrt{-a}\,b^2\arctan\left(\frac{\sqrt{-a}\sqrt{\frac{2^x a-b}{2^x}}}{a}\right)}{4\,a^3}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4^x/(a-b/(2^x))^(1/2),x, algorithm="fricas")
```

```
[Out] [1/8*(3*sqrt(a)*b^2*log(-2*2^x*a - 2*2^x*sqrt(a)*sqrt((2^x*a - b)/2^x) + b)
 + 2*(2*2^(2*x)*a^2 + 3*2^x*a*b)*sqrt((2^x*a - b)/2^x))/(a^3*log(2)), -1/4*
(3*sqrt(-a)*b^2*arctan(sqrt(-a)*sqrt((2^x*a - b)/2^x)/a) - (2*2^(2*x)*a^2 +
 3*2^x*a*b)*sqrt((2^x*a - b)/2^x))/(a^3*log(2))]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{4^x}{\sqrt{a-\frac{b}{2^x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4^x/(a-b/(2^x))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(4^x/sqrt(a - b/2^x), x)
```

maple [F] time = 0.04, size = 0, normalized size = 0.00

$$\int \frac{4^x}{\sqrt{-b2^{-x}+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(4^x/(a-b/(2^x))^(1/2),x)
```

```
[Out] int(4^x/(a-b/(2^x))^(1/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{4^x}{\sqrt{a-\frac{b}{2^x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4^x/(a-b/(2^x))^(1/2),x, algorithm="maxima")
[Out] integrate(4^x/sqrt(a - b/2^x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{4^x}{\sqrt{a-\frac{b}{2^x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(4^x/(a - b/2^x)^(1/2),x)
[Out] int(4^x/(a - b/2^x)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{4^x}{\sqrt{a-2^{-x}b}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(4**x/(a-b/(2**x))**(1/2),x)
[Out] Integral(4**x/sqrt(a - 2**(-x)*b), x)
```

3.504 $\int \frac{2^{2x}}{\sqrt{a-2^{-x}b}}\,dx$

Optimal. Leaf size=96

$$\frac{3b^2\tanh^{-1}\left(\frac{\sqrt{a-b2^{-x}}}{\sqrt{a}}\right)}{4a^{5/2}\log(2)}+\frac{3b2^{x-2}\sqrt{a-b2^{-x}}}{a^2\log(2)}+\frac{2^{2x-1}\sqrt{a-b2^{-x}}}{a\log(2)}$$

```
[Out] 3/4*b^2*arctanh((a-b/(2^x))^(1/2)/a^(1/2))/a^(5/2)/ln(2)+2^(-1+2*x)*(a-b/(2
^x))^(1/2)/a/ln(2)+3*2^(-2+x)*b*(a-b/(2^x))^(1/2)/a^2/ln(2)
```

Rubi [A] time = 0.08, antiderivative size = 96, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2248, 51, 63, 208}

$$\frac{3b^2\tanh^{-1}\left(\frac{\sqrt{a-b2^{-x}}}{\sqrt{a}}\right)}{4a^{5/2}\log(2)}+\frac{3b2^{x-2}\sqrt{a-b2^{-x}}}{a^2\log(2)}+\frac{2^{2x-1}\sqrt{a-b2^{-x}}}{a\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[2^(2*x)/Sqrt[a - b/2^x],x]
```

```
[Out] (2^(-1 + 2*x)*Sqrt[a - b/2^x])/(a*Log[2]) + (3*2^(-2 + x)*b*Sqrt[a - b/2^x]
)/(a^2*Log[2]) + (3*b^2*ArcTanh[Sqrt[a - b/2^x]/Sqrt[a]])/(4*a^(5/2)*Log[2]
)
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2248

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(g*h*Log[G])/(d*e*Lo
g[F])]}, Dist[(Denominator[m]*G^(f*h - (c*g*h)/d))/(d*e*Log[F]), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^((e*(c + d*x))/De
nominator[m])], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{2^{2x}}{\sqrt{a-2^{-x}b}}\,dx &= -\frac{\text{Subst}\left(\int \frac{1}{x^3\sqrt{a-bx}}\,dx, x, 2^{-x}\right)}{\log(2)}\\
&= \frac{2^{-1+2x}\sqrt{a-2^{-x}b}}{a\log(2)} - \frac{(3b)\,\text{Subst}\left(\int \frac{1}{x^2\sqrt{a-bx}}\,dx, x, 2^{-x}\right)}{4a\log(2)}\\
&= \frac{2^{-1+2x}\sqrt{a-2^{-x}b}}{a\log(2)} + \frac{3\,2^{-2+x}b\sqrt{a-2^{-x}b}}{a^2\log(2)} - \frac{\left(3b^2\right)\text{Subst}\left(\int \frac{1}{x\sqrt{a-bx}}\,dx, x, 2^{-x}\right)}{8a^2\log(2)}\\
&= \frac{2^{-1+2x}\sqrt{a-2^{-x}b}}{a\log(2)} + \frac{3\,2^{-2+x}b\sqrt{a-2^{-x}b}}{a^2\log(2)} + \frac{(3b)\,\text{Subst}\left(\int \frac{1}{\frac{a}{b}-\frac{x^2}{b}}\,dx, x, \sqrt{a-2^{-x}b}\right)}{4a^2\log(2)}\\
&= \frac{2^{-1+2x}\sqrt{a-2^{-x}b}}{a\log(2)} + \frac{3\,2^{-2+x}b\sqrt{a-2^{-x}b}}{a^2\log(2)} + \frac{3b^2\tanh^{-1}\left(\frac{\sqrt{a-2^{-x}b}}{\sqrt{a}}\right)}{4a^{5/2}\log(2)}
\end{aligned}$$

Mathematica [A] time = 0.01, size = 115, normalized size = 1.20

$$\frac{2^{-\frac{x}{2}-2}\left(\sqrt{a}\,2^{x/2}\left(a^2 2^{2x+1}+ab2^x-3b^2\right)+3b^2\sqrt{a2^x-b}\,\tanh^{-1}\left(\frac{\sqrt{a}\,2^{x/2}}{\sqrt{a2^x-b}}\right)\right)}{a^{5/2}\log(2)\sqrt{a-b2^{-x}}}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^(2*x)/Sqrt[a - b/2^x],x]
```

```
[Out] (2^(-2 - x/2)*(2^(x/2)*Sqrt[a]*(2^(1 + 2*x)*a^2 + 2^x*a*b - 3*b^2) + 3*Sqrt
[2^x*a - b]*b^2*ArcTanh[(2^(x/2)*Sqrt[a])/Sqrt[2^x*a - b]]))/(a^(5/2)*Sqrt[
a - b/2^x]*Log[2])
```

fricas [A] time = 0.44, size = 174, normalized size = 1.81

$$\left[\frac{3\sqrt{a}\,b^2\log\left(-2\cdot 2^x a - 2\cdot 2^x\sqrt{a}\sqrt{\frac{2^x a-b}{2^x}} + b\right) + 2\left(2\cdot 2^{2x}a^2 + 3\cdot 2^x ab\right)\sqrt{\frac{2^x a-b}{2^x}}}{8\,a^3\log(2)}, -\frac{3\sqrt{-a}\,b^2\arctan\left(\frac{\sqrt{-a}\sqrt{\frac{2^x a-b}{2^x}}}{a}\right)}{4\,a^3 \cdots}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(2*x)/(a-b/(2^x))^(1/2),x, algorithm="fricas")
```

```
[Out] [1/8*(3*sqrt(a)*b^2*log(-2*2^x*a - 2*2^x*sqrt(a)*sqrt((2^x*a - b)/2^x) + b)
 + 2*(2*2^(2*x)*a^2 + 3*2^x*a*b)*sqrt((2^x*a - b)/2^x))/(a^3*log(2)), -1/4*
(3*sqrt(-a)*b^2*arctan(sqrt(-a)*sqrt((2^x*a - b)/2^x)/a) - (2*2^(2*x)*a^2 +
 3*2^x*a*b)*sqrt((2^x*a - b)/2^x))/(a^3*log(2))]
```

giac [A] time = 0.47, size = 96, normalized size = 1.00

$$\frac{2\sqrt{2^{2x}a - 2^x b}\left(\frac{2\cdot 2^x}{a} + \frac{3b}{a^2}\right) - \frac{3b^2\log\left(\left|2\left(2^x\sqrt{a} - \sqrt{2^{2x}a - 2^x b}\right)\sqrt{a} - b\right|\right)}{a^{\frac{5}{2}}} + \frac{3b^2\log(|b|)}{a^{\frac{5}{2}}}}{8\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(2*x)/(a-b/(2^x))^(1/2),x, algorithm="giac")
```

```
[Out] 1/8*(2*sqrt(2^(2*x)*a - 2^x*b)*(2*2^x/a + 3*b/a^2) - 3*b^2*log(abs(2*(2^x*s
qrt(a) - sqrt(2^(2*x)*a - 2^x*b))*sqrt(a) - b))/a^(5/2) + 3*b^2*log(abs(b))
/a^(5/2))/log(2)
```

maple [F] time = 0.02, size = 0, normalized size = 0.00

$$\int \frac{2^{2x}}{\sqrt{-b2^{-x} + a}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^(2*x)/(a-b/(2^x))^(1/2),x)
```

```
[Out] int(2^(2*x)/(a-b/(2^x))^(1/2),x)
```

maxima [A] time = 1.96, size = 130, normalized size = 1.35

$$-\frac{3\,b^{2}\log\left(\frac{\sqrt{a-\frac{b}{2^{x}}}-\sqrt{a}}{\sqrt{a-\frac{b}{2^{x}}}+\sqrt{a}}\right)}{8\,a^{\frac{5}{2}}\log(2)}-\frac{3\left(a-\frac{b}{2^{x}}\right)^{\frac{3}{2}}b^{2}-5\sqrt{a-\frac{b}{2^{x}}}\,ab^{2}}{4\left(\left(a-\frac{b}{2^{x}}\right)^{2}a^{2}-2\left(a-\frac{b}{2^{x}}\right)a^{3}+a^{4}\right)\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(2*x)/(a-b/(2^x))^(1/2),x, algorithm="maxima")
```

```
[Out] -3/8*b^2*log((sqrt(a - b/2^x) - sqrt(a))/(sqrt(a - b/2^x) + sqrt(a)))/(a^(5
/2)*log(2)) - 1/4*(3*(a - b/2^x)^(3/2)*b^2 - 5*sqrt(a - b/2^x)*a*b^2)/(((a
- b/2^x)^2*a^2 - 2*(a - b/2^x)*a^3 + a^4)*log(2))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{2^{2\,x}}{\sqrt{a-\frac{b}{2^{x}}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^(2*x)/(a - b/2^x)^(1/2),x)
```

```
[Out] int(2^(2*x)/(a - b/2^x)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{2^{2x}}{\sqrt{a-2^{-x}b}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**(2*x)/(a-b/(2**x))**(1/2),x)
```

```
[Out] Integral(2**(2*x)/sqrt(a - 2**(-x)*b), x)
```

3.505 $\int \frac{1}{1+2e^x+e^{2x}}\,dx$

Optimal. Leaf size=17

$$x+\frac{1}{e^x+1}-\log\left(e^x+1\right)$$

```
[Out] 1/(1+exp(x))+x-ln(1+exp(x))
```

Rubi [A] time = 0.01, antiderivative size = 17, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2282, 44}

$$x+\frac{1}{e^x+1}-\log\left(e^x+1\right)$$

Antiderivative was successfully verified.

```
[In] Int[(1 + 2*E^x + E^(2*x))^(-1),x]
```

```
[Out] (1 + E^x)^(-1) + x - Log[1 + E^x]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}
\int \frac{1}{1+2e^x+e^{2x}}\,dx &= \text{Subst}\left(\int \frac{1}{x(1+x)^2}\,dx,x,e^x\right)\\
&= \text{Subst}\left(\int \left(\frac{1}{-1-x}+\frac{1}{x}-\frac{1}{(1+x)^2}\right)dx,x,e^x\right)\\
&= \frac{1}{1+e^x}+x-\log\left(1+e^x\right)
\end{aligned}$$

Mathematica [A] time = 0.02, size = 17, normalized size = 1.00

$$x + \frac{1}{e^x + 1} - \log(e^x + 1)$$

Antiderivative was successfully verified.

```
[In] Integrate[(1 + 2*E^x + E^(2*x))^(-1),x]
[Out] (1 + E^x)^(-1) + x - Log[1 + E^x]
```

fricas [A] time = 0.42, size = 25, normalized size = 1.47

$$\frac{xe^x - (e^x + 1)\log(e^x + 1) + x + 1}{e^x + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(1+2*exp(x)+exp(2*x)),x, algorithm="fricas")
[Out] (x*e^x - (e^x + 1)*log(e^x + 1) + x + 1)/(e^x + 1)
```

giac [A] time = 0.24, size = 15, normalized size = 0.88

$$x + \frac{1}{e^x + 1} - \log(e^x + 1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(1+2*exp(x)+exp(2*x)),x, algorithm="giac")
[Out] x + 1/(e^x + 1) - log(e^x + 1)
```

maple [A] time = 0.02, size = 18, normalized size = 1.06

$$-\ln(e^x + 1) + \ln(e^x) + \frac{1}{e^x + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(1+2*exp(x)+exp(2*x)),x)
[Out] 1/(exp(x)+1)-ln(exp(x)+1)+ln(exp(x))
```

maxima [A] time = 0.59, size = 15, normalized size = 0.88

$$x + \frac{1}{e^x + 1} - \log(e^x + 1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(1+2*exp(x)+exp(2*x)),x, algorithm="maxima")
```

```
[Out] x + 1/(e^x + 1) - log(e^x + 1)
```

mupad [B] time = 3.26, size = 15, normalized size = 0.88

$$x - \ln(\mathrm{e}^x + 1) + \frac{1}{\mathrm{e}^x + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(exp(2*x) + 2*exp(x) + 1),x)
```

```
[Out] x - log(exp(x) + 1) + 1/(exp(x) + 1)
```

sympy [A] time = 0.09, size = 14, normalized size = 0.82

$$x - \log(e^x + 1) + \frac{1}{e^x + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(1+2*exp(x)+exp(2*x)),x)
```

```
[Out] x - log(exp(x) + 1) + 1/(exp(x) + 1)
```

3.506 $\int \frac{1}{2+3e^x+e^{2x}} \, dx$

Optimal. Leaf size=24

$$\frac{x}{2}-\log\left(e^x+1\right)+\frac{1}{2}\log\left(e^x+2\right)$$

```
[Out] 1/2*x-ln(1+exp(x))+1/2*ln(2+exp(x))
```

Rubi [A] time = 0.02, antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.357, Rules used = {2282, 705, 29, 632, 31}

$$\frac{x}{2}-\log\left(e^x+1\right)+\frac{1}{2}\log\left(e^x+2\right)$$

Antiderivative was successfully verified.

```
[In] Int[(2 + 3*E^x + E^(2*x))^(-1),x]
```

```
[Out] x/2 - Log[1 + E^x] + Log[2 + E^x]/2
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 632

```
Int[((d_.) + (e_.)*(x_))/((a_) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> W
ith[{q = Rt[b^2 - 4*a*c, 2]}, Dist[(c*d - e*(b/2 - q/2))/q, Int[1/(b/2 - q/
2 + c*x), x], x] - Dist[(c*d - e*(b/2 + q/2))/q, Int[1/(b/2 + q/2 + c*x), x
], x]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[2*c*d - b*e, 0] && NeQ[b^2 - 4*a
*c, 0] && NiceSqrtQ[b^2 - 4*a*c]
```

Rule 705

```
Int[1/(((d_.) + (e_.)*(x_))*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)), x_Symbol]
 :> Dist[e^2/(c*d^2 - b*d*e + a*e^2), Int[1/(d + e*x), x], x] + Dist[1/(c*d
^2 - b*d*e + a*e^2), Int[(c*d - b*e - c*e*x)/(a + b*x + c*x^2), x], x] /; F
reeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^
2, 0] && NeQ[2*c*d - b*e, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}\int \frac{1}{2+3e^x+e^{2x}}\,dx &= \text{Subst}\left(\int \frac{1}{x\left(2+3x+x^2\right)}\,dx,x,e^x\right)\\ &= \frac{1}{2}\text{Subst}\left(\int \frac{1}{x}\,dx,x,e^x\right)+\frac{1}{2}\text{Subst}\left(\int \frac{-3-x}{2+3x+x^2}\,dx,x,e^x\right)\\ &= \frac{x}{2}+\frac{1}{2}\text{Subst}\left(\int \frac{1}{2+x}\,dx,x,e^x\right)-\text{Subst}\left(\int \frac{1}{1+x}\,dx,x,e^x\right)\\ &= \frac{x}{2}-\log\left(1+e^x\right)+\frac{1}{2}\log\left(2+e^x\right)\end{aligned}$$

Mathematica [A] time = 0.01, size = 24, normalized size = 1.00

$$\frac{x}{2}-\log\left(e^x+1\right)+\frac{1}{2}\log\left(e^x+2\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(2 + 3*E^x + E^(2*x))^(-1),x]
[Out] x/2 - Log[1 + E^x] + Log[2 + E^x]/2
```

fricas [A] time = 0.42, size = 18, normalized size = 0.75

$$\frac{1}{2}x+\frac{1}{2}\log\left(e^x+2\right)-\log\left(e^x+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(2+3*exp(x)+exp(2*x)),x, algorithm="fricas")
[Out] 1/2*x + 1/2*log(e^x + 2) - log(e^x + 1)
```

giac [A] time = 0.37, size = 18, normalized size = 0.75

$$\frac{1}{2}x+\frac{1}{2}\log\left(e^x+2\right)-\log\left(e^x+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(2+3*exp(x)+exp(2*x)),x, algorithm="giac")
```

```
[Out] 1/2*x + 1/2*log(e^x + 2) - log(e^x + 1)
```

maple [A] time = 0.02, size = 21, normalized size = 0.88

$$-\ln\left(\mathrm{e}^{x}+1\right)+\frac{\ln\left(\mathrm{e}^{x}+2\right)}{2}+\frac{\ln\left(\mathrm{e}^{x}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(2+3*exp(x)+exp(2*x)),x)
```

```
[Out] 1/2*ln(2+exp(x))-ln(exp(x)+1)+1/2*ln(exp(x))
```

maxima [A] time = 0.84, size = 18, normalized size = 0.75

$$\frac{1}{2}\,x+\frac{1}{2}\,\log\left(e^{x}+2\right)-\log\left(e^{x}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(2+3*exp(x)+exp(2*x)),x, algorithm="maxima")
```

```
[Out] 1/2*x + 1/2*log(e^x + 2) - log(e^x + 1)
```

mupad [B] time = 0.07, size = 18, normalized size = 0.75

$$\frac{x}{2}-\ln\left(\mathrm{e}^{x}+1\right)+\frac{\ln\left(\mathrm{e}^{x}+2\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(exp(2*x) + 3*exp(x) + 2),x)
```

```
[Out] x/2 - log(exp(x) + 1) + log(exp(x) + 2)/2
```

sympy [A] time = 0.12, size = 17, normalized size = 0.71

$$\frac{x}{2}-\log\left(e^{x}+1\right)+\frac{\log\left(e^{x}+2\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(2+3*exp(x)+exp(2*x)),x)
```

```
[Out] x/2 - log(exp(x) + 1) + log(exp(x) + 2)/2
```

3.507 $\int \frac{1}{-1+e^x+e^{2x}}\,dx$

Optimal. Leaf size=56

$$-x+\frac{1}{10}\left(5+\sqrt{5}\right)\log\left(2e^x+1-\sqrt{5}\right)+\frac{1}{10}\left(5-\sqrt{5}\right)\log\left(2e^x+1+\sqrt{5}\right)$$

```
[Out] -x+1/10*ln(1+2*exp(x)+5^(1/2))*(5-5^(1/2))+1/10*ln(1+2*exp(x)-5^(1/2))*(5+5
^(1/2))
```

Rubi [A] time = 0.03, antiderivative size = 56, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.417, Rules used = {2282, 705, 29, 632, 31}

$$-x+\frac{1}{10}\left(5+\sqrt{5}\right)\log\left(2e^x+1-\sqrt{5}\right)+\frac{1}{10}\left(5-\sqrt{5}\right)\log\left(2e^x+1+\sqrt{5}\right)$$

Antiderivative was successfully verified.

```
[In] Int[(-1 + E^x + E^(2*x))^(-1),x]
```

```
[Out] -x + ((5 + Sqrt[5])*Log[1 - Sqrt[5] + 2*E^x])/10 + ((5 - Sqrt[5])*Log[1 + S
qrt[5] + 2*E^x])/10
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 632

```
Int[((d_.) + (e_.)*(x_))/((a_) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> W
ith[{q = Rt[b^2 - 4*a*c, 2]}, Dist[(c*d - e*(b/2 - q/2))/q, Int[1/(b/2 - q/
2 + c*x), x], x] - Dist[(c*d - e*(b/2 + q/2))/q, Int[1/(b/2 + q/2 + c*x), x
], x]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[2*c*d - b*e, 0] && NeQ[b^2 - 4*a
*c, 0] && NiceSqrtQ[b^2 - 4*a*c]
```

Rule 705

```
Int[1/(((d_.) + (e_.)*(x_))*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)), x_Symbol]
 :> Dist[e^2/(c*d^2 - b*d*e + a*e^2), Int[1/(d + e*x), x], x] + Dist[1/(c*d
^2 - b*d*e + a*e^2), Int[(c*d - b*e - c*e*x)/(a + b*x + c*x^2), x], x] /; F
```

```
reeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^
2, 0] && NeQ[2*c*d - b*e, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}\int \frac{1}{-1+e^x+e^{2x}}\,dx &= \text{Subst}\left(\int \frac{1}{x\left(-1+x+x^2\right)}\,dx, x, e^x\right)\\ &= -\text{Subst}\left(\int \frac{1}{x}\,dx, x, e^x\right)-\text{Subst}\left(\int \frac{-1-x}{-1+x+x^2}\,dx, x, e^x\right)\\ &= -x+\frac{1}{10}\left(5-\sqrt{5}\right)\text{Subst}\left(\int \frac{1}{\frac{1}{2}+\frac{\sqrt{5}}{2}+x}\,dx, x, e^x\right)+\frac{1}{10}\left(5+\sqrt{5}\right)\text{Subst}\left(\int \frac{1}{\frac{1}{2}-\frac{\sqrt{5}}{2}+x}\,dx\right.\\ &= -x+\frac{1}{10}\left(5+\sqrt{5}\right)\log\left(1-\sqrt{5}+2e^x\right)+\frac{1}{10}\left(5-\sqrt{5}\right)\log\left(1+\sqrt{5}+2e^x\right)\end{aligned}$$

Mathematica [A] time = 0.03, size = 44, normalized size = 0.79

$$-x+\frac{1}{2}\log\left(-e^x-e^{2x}+1\right)-\frac{\tanh^{-1}\left(\frac{2e^x+1}{\sqrt{5}}\right)}{\sqrt{5}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(-1 + E^x + E^(2*x))^(-1),x]
[Out] -x - ArcTanh[(1 + 2*E^x)/Sqrt[5]]/Sqrt[5] + Log[1 - E^x - E^(2*x)]/2
```

fricas [A] time = 0.42, size = 53, normalized size = 0.95

$$\frac{1}{10}\sqrt{5}\log\left(-\frac{2\left(\sqrt{5}-1\right)e^x+\sqrt{5}-2e^{(2x)}-3}{e^{(2x)}+e^x-1}\right)-x+\frac{1}{2}\log\left(e^{(2x)}+e^x-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-1+exp(x)+exp(2*x)),x, algorithm="fricas")
```

```
[Out] 1/10*sqrt(5)*log(-(2*(sqrt(5) - 1)*e^x + sqrt(5) - 2*e^(2*x) - 3)/(e^(2*x)
+ e^x - 1)) - x + 1/2*log(e^(2*x) + e^x - 1)
```

giac [A] time = 0.36, size = 46, normalized size = 0.82

$$\frac{1}{10}\,\sqrt{5}\,\log\left(\frac{\left|-\sqrt{5}\,+2\,e^{x}+1\right|}{\sqrt{5}\,+2\,e^{x}+1}\right)-x+\frac{1}{2}\,\log\left(\left|e^{(2\,x)}+e^{x}-1\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-1+exp(x)+exp(2*x)),x, algorithm="giac")
```

```
[Out] 1/10*sqrt(5)*log(abs(-sqrt(5) + 2*e^x + 1)/(sqrt(5) + 2*e^x + 1)) - x + 1/2
*log(abs(e^(2*x) + e^x - 1))
```

maple [A] time = 0.02, size = 35, normalized size = 0.62

$$-\frac{\sqrt{5}\,\operatorname{arctanh}\left(\frac{(2\,\mathrm{e}^{x}+1)\sqrt{5}}{5}\right)}{5}+\frac{\ln\left(\mathrm{e}^{x}+\mathrm{e}^{2x}-1\right)}{2}-\ln\left(\mathrm{e}^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-1+exp(x)+exp(2*x)),x)
```

```
[Out] 1/2*ln(-1+exp(x)+exp(x)^2)-1/5*5^(1/2)*arctanh(1/5*(1+2*exp(x))*5^(1/2))-ln
(exp(x))
```

maxima [A] time = 1.86, size = 43, normalized size = 0.77

$$\frac{1}{10}\,\sqrt{5}\,\log\left(-\frac{\sqrt{5}\,-2\,e^{x}-1}{\sqrt{5}\,+2\,e^{x}+1}\right)-x+\frac{1}{2}\,\log\left(e^{(2\,x)}+e^{x}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-1+exp(x)+exp(2*x)),x, algorithm="maxima")
```

```
[Out] 1/10*sqrt(5)*log(-(sqrt(5) - 2*e^x - 1)/(sqrt(5) + 2*e^x + 1)) - x + 1/2*lo
g(e^(2*x) + e^x - 1)
```

mupad [B] time = 3.70, size = 32, normalized size = 0.57

$$\frac{\ln\left(\mathrm{e}^{2\,x}+\mathrm{e}^{x}-1\right)}{2}-x-\frac{\sqrt{5}\,\operatorname{atanh}\left(\frac{\sqrt{5}\,\left(2\,\mathrm{e}^{x}+1\right)}{5}\right)}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(exp(2*x) + exp(x) - 1),x)
```

```
[Out] log(exp(2*x) + exp(x) - 1)/2 - x - (5^(1/2)*atanh((5^(1/2)*(2*exp(x) + 1))/
5))/5
```

sympy [A] time = 0.13, size = 22, normalized size = 0.39

$$-x + \operatorname{RootSum}\left(5z^2 - 5z + 1, \left(i \mapsto i \log\left(-5i + e^x + 3\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-1+exp(x)+exp(2*x)),x)
```

```
[Out] -x + RootSum(5*_z**2 - 5*_z + 1, Lambda(_i, _i*log(-5*_i + exp(x) + 3)))
```

3.508 $\int \frac{1}{3+3e^x+e^{2x}}\,dx$

Optimal. Leaf size=44

$$\frac{x}{3}-\frac{1}{6}\log\left(3e^x+e^{2x}+3\right)-\frac{\tan^{-1}\left(\frac{2e^x+3}{\sqrt{3}}\right)}{\sqrt{3}}$$

```
[Out] 1/3*x-1/6*ln(3+3*exp(x)+exp(2*x))-1/3*arctan(1/3*(3+2*exp(x))*3^(1/2))*3^(1
/2)
```

Rubi [A] time = 0.04, antiderivative size = 44, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {2282, 705, 29, 634, 618, 204, 628}

$$\frac{x}{3}-\frac{1}{6}\log\left(3e^x+e^{2x}+3\right)-\frac{\tan^{-1}\left(\frac{2e^x+3}{\sqrt{3}}\right)}{\sqrt{3}}$$

Antiderivative was successfully verified.

```
[In] Int[(3 + 3*E^x + E^(2*x))^(-1),x]
```

```
[Out] x/3 - ArcTan[(3 + 2*E^x)/Sqrt[3]]/Sqrt[3] - Log[3 + 3*E^x + E^(2*x)]/6
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
a, 0] || LtQ[b, 0])
```

Rule 618

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> Dist[-2, Subst[I
nt[1/Simp[b^2 - 4*a*c - x^2, x], x], x, b + 2*c*x], x] /; FreeQ[{a, b, c},
x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
```

```
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 634

```
Int[((d_.) + (e_.)*(x_))/((a_) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> D
ist[(2*c*d - b*e)/(2*c), Int[1/(a + b*x + c*x^2), x], x] + Dist[e/(2*c), In
t[(b + 2*c*x)/(a + b*x + c*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && NeQ
[2*c*d - b*e, 0] && NeQ[b^2 - 4*a*c, 0] &&  !NiceSqrtQ[b^2 - 4*a*c]
```

Rule 705

```
Int[1/(((d_.) + (e_.)*(x_))*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)), x_Symbol]
 :> Dist[e^2/(c*d^2 - b*d*e + a*e^2), Int[1/(d + e*x), x], x] + Dist[1/(c*d
^2 - b*d*e + a*e^2), Int[(c*d - b*e - c*e*x)/(a + b*x + c*x^2), x], x] /; F
reeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^
2, 0] && NeQ[2*c*d - b*e, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}
\int \frac{1}{3+3e^x+e^{2x}}\,dx &= \text{Subst}\left(\int \frac{1}{x\left(3+3x+x^2\right)}\,dx, x, e^x\right) \\
&= \frac{1}{3}\text{Subst}\left(\int \frac{1}{x}\,dx, x, e^x\right)+\frac{1}{3}\text{Subst}\left(\int \frac{-3-x}{3+3x+x^2}\,dx, x, e^x\right) \\
&= \frac{x}{3}-\frac{1}{6}\text{Subst}\left(\int \frac{3+2x}{3+3x+x^2}\,dx, x, e^x\right)-\frac{1}{2}\text{Subst}\left(\int \frac{1}{3+3x+x^2}\,dx, x, e^x\right) \\
&= \frac{x}{3}-\frac{1}{6}\log\left(3+3e^x+e^{2x}\right)+\text{Subst}\left(\int \frac{1}{-3-x^2}\,dx, x, 3+2e^x\right) \\
&= \frac{x}{3}-\frac{\tan^{-1}\left(\frac{3+2e^x}{\sqrt{3}}\right)}{\sqrt{3}}-\frac{1}{6}\log\left(3+3e^x+e^{2x}\right)
\end{aligned}$$

Mathematica [A] time = 0.02, size = 44, normalized size = 1.00

$$\frac{x}{3}-\frac{1}{6}\log\left(3e^x+e^{2x}+3\right)-\frac{\tan^{-1}\left(\frac{2e^x+3}{\sqrt{3}}\right)}{\sqrt{3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(3 + 3*E^x + E^(2*x))^(-1),x]
```

```
[Out] x/3 - ArcTan[(3 + 2*E^x)/Sqrt[3]]/Sqrt[3] - Log[3 + 3*E^x + E^(2*x)]/6
```

fricas [A] time = 0.44, size = 34, normalized size = 0.77

$$-\frac{1}{3}\sqrt{3}\arctan\left(\frac{2}{3}\sqrt{3}e^x+\sqrt{3}\right)+\frac{1}{3}x-\frac{1}{6}\log\left(e^{(2x)}+3e^x+3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(3+3*exp(x)+exp(2*x)),x, algorithm="fricas")
```

```
[Out] -1/3*sqrt(3)*arctan(2/3*sqrt(3)*e^x + sqrt(3)) + 1/3*x - 1/6*log(e^(2*x) +
3*e^x + 3)
```

giac [A] time = 0.29, size = 34, normalized size = 0.77

$$-\frac{1}{3}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}(2e^x+3)\right)+\frac{1}{3}x-\frac{1}{6}\log\left(e^{(2x)}+3e^x+3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(3+3*exp(x)+exp(2*x)),x, algorithm="giac")
```

```
[Out] -1/3*sqrt(3)*arctan(1/3*sqrt(3)*(2*e^x + 3)) + 1/3*x - 1/6*log(e^(2*x) + 3*
e^x + 3)
```

maple [A] time = 0.02, size = 37, normalized size = 0.84

$$-\frac{\sqrt{3}\arctan\left(\frac{(2e^x+3)\sqrt{3}}{3}\right)}{3}-\frac{\ln\left(3e^x+e^{2x}+3\right)}{6}+\frac{\ln\left(e^x\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(3+3*exp(x)+exp(2*x)),x)
```

```
[Out] -1/6*ln(3+3*exp(x)+exp(x)^2)-1/3*arctan(1/3*(3+2*exp(x))*3^(1/2))*3^(1/2)+1
/3*ln(exp(x))
```

maxima [A] time = 2.02, size = 34, normalized size = 0.77

$$-\frac{1}{3}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}\,(2\,e^{x}+3)\right)+\frac{1}{3}\,x-\frac{1}{6}\,\log\left(e^{(2\,x)}+3\,e^{x}+3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(3+3*exp(x)+exp(2*x)),x, algorithm="maxima")
```

```
[Out] -1/3*sqrt(3)*arctan(1/3*sqrt(3)*(2*e^x + 3)) + 1/3*x - 1/6*log(e^(2*x) + 3*
e^x + 3)
```

mupad [B] time = 3.52, size = 34, normalized size = 0.77

$$\frac{x}{3}-\frac{\ln\left(e^{2\,x}+3\,e^{x}+3\right)}{6}-\frac{\sqrt{3}\,\mathrm{atan}\left(\sqrt{3}+\frac{2\,\sqrt{3}\,e^{x}}{3}\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(exp(2*x) + 3*exp(x) + 3),x)
```

```
[Out] x/3 - log(exp(2*x) + 3*exp(x) + 3)/6 - (3^(1/2)*atan(3^(1/2) + (2*3^(1/2)*e
xp(x))/3))/3
```

sympy [A] time = 0.13, size = 24, normalized size = 0.55

$$\frac{x}{3}+\operatorname{RootSum}\left(9z^{2}+3z+1,\left(i\mapsto i\log\left(-3i+e^{x}+1\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(3+3*exp(x)+exp(2*x)),x)
```

```
[Out] x/3 + RootSum(9*_z**2 + 3*_z + 1, Lambda(_i, _i*log(-3*_i + exp(x) + 1)))
```

3.509 $\int \frac{1}{a+be^x+ce^{2x}}\,dx$

Optimal. Leaf size=67

$$\frac{b\tanh^{-1}\left(\frac{b+2ce^x}{\sqrt{b^2-4ac}}\right)}{a\sqrt{b^2-4ac}}-\frac{\log\left(a+be^x+ce^{2x}\right)}{2a}+\frac{x}{a}$$

```
[Out] x/a-1/2*ln(a+b*exp(x)+c*exp(2*x))/a+b*arctanh((b+2*c*exp(x))/(-4*a*c+b^2)^(
1/2))/a/(-4*a*c+b^2)^(1/2)
```

Rubi [A] time = 0.06, antiderivative size = 67, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.438, Rules used = {2282, 705, 29, 634, 618, 206, 628}

$$\frac{b\tanh^{-1}\left(\frac{b+2ce^x}{\sqrt{b^2-4ac}}\right)}{a\sqrt{b^2-4ac}}-\frac{\log\left(a+be^x+ce^{2x}\right)}{2a}+\frac{x}{a}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*E^x + c*E^(2*x))^(-1),x]
```

```
[Out] x/a + (b*ArcTanh[(b + 2*c*E^x)/Sqrt[b^2 - 4*a*c]])/(a*Sqrt[b^2 - 4*a*c]) -
Log[a + b*E^x + c*E^(2*x)]/(2*a)
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 618

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> Dist[-2, Subst[I
nt[1/Simp[b^2 - 4*a*c - x^2, x], x], x, b + 2*c*x], x] /; FreeQ[{a, b, c},
x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
```

```
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 634

```
Int[((d_.) + (e_.)*(x_))/((a_) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> D
ist[(2*c*d - b*e)/(2*c), Int[1/(a + b*x + c*x^2), x], x] + Dist[e/(2*c), In
t[(b + 2*c*x)/(a + b*x + c*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && NeQ
[2*c*d - b*e, 0] && NeQ[b^2 - 4*a*c, 0] &&  !NiceSqrtQ[b^2 - 4*a*c]
```

Rule 705

```
Int[1/(((d_.) + (e_.)*(x_))*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)), x_Symbol]
 :> Dist[e^2/(c*d^2 - b*d*e + a*e^2), Int[1/(d + e*x), x], x] + Dist[1/(c*d
^2 - b*d*e + a*e^2), Int[(c*d - b*e - c*e*x)/(a + b*x + c*x^2), x], x] /; F
reeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^
2, 0] && NeQ[2*c*d - b*e, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}
\int \frac{1}{a+be^x+ce^{2x}}\,dx &= \text{Subst}\left(\int \frac{1}{x\left(a+bx+cx^2\right)}\,dx,x,e^x\right)\\
&= \frac{\text{Subst}\left(\int \frac{1}{x}\,dx,x,e^x\right)}{a}+\frac{\text{Subst}\left(\int \frac{-b-cx}{a+bx+cx^2}\,dx,x,e^x\right)}{a}\\
&= \frac{x}{a}-\frac{\text{Subst}\left(\int \frac{b+2cx}{a+bx+cx^2}\,dx,x,e^x\right)}{2a}-\frac{b\,\text{Subst}\left(\int \frac{1}{a+bx+cx^2}\,dx,x,e^x\right)}{2a}\\
&= \frac{x}{a}-\frac{\log\left(a+be^x+ce^{2x}\right)}{2a}+\frac{b\,\text{Subst}\left(\int \frac{1}{b^2-4ac-x^2}\,dx,x,b+2ce^x\right)}{a}\\
&= \frac{x}{a}+\frac{b\tanh^{-1}\left(\frac{b+2ce^x}{\sqrt{b^2-4ac}}\right)}{a\sqrt{b^2-4ac}}-\frac{\log\left(a+be^x+ce^{2x}\right)}{2a}
\end{aligned}$$

Mathematica [A] time = 0.11, size = 66, normalized size = 0.99

$$-\frac{\frac{2b\tan^{-1}\left(\frac{b+2ce^x}{\sqrt{4ac-b^2}}\right)}{\sqrt{4ac-b^2}}+\log\left(a+e^x\left(b+ce^x\right)\right)-2x}{2a}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*E^x + c*E^(2*x))^(-1),x]
```

```
[Out] -1/2*(-2*x + (2*b*ArcTan[(b + 2*c*E^x)/Sqrt[-b^2 + 4*a*c]])/Sqrt[-b^2 + 4*a
*c] + Log[a + E^x*(b + c*E^x)])/a
```

fricas [A] time = 0.42, size = 219, normalized size = 3.27

$$\left[\frac{\sqrt{b^2-4\,ac}\,b\log\left(\frac{2\,c^2e^{(2\,x)}+2\,bce^x+b^2-2\,ac+\sqrt{b^2-4\,ac}\,(2\,ce^x+b)}{ce^{(2\,x)}+be^x+a}\right)+2\left(b^2-4\,ac\right)x-\left(b^2-4\,ac\right)\log\left(ce^{(2\,x)}+be^x+a\right)}{2\left(ab^2-4\,a^2c\right)},\ 2\,\sqrt{-\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*exp(x)+c*exp(2*x)),x, algorithm="fricas")
```

```
[Out] [1/2*(sqrt(b^2 - 4*a*c)*b*log((2*c^2*e^(2*x) + 2*b*c*e^x + b^2 - 2*a*c + sq
rt(b^2 - 4*a*c)*(2*c*e^x + b))/(c*e^(2*x) + b*e^x + a)) + 2*(b^2 - 4*a*c)*x
 - (b^2 - 4*a*c)*log(c*e^(2*x) + b*e^x + a))/(a*b^2 - 4*a^2*c), 1/2*(2*sqrt
(-b^2 + 4*a*c)*b*arctan(-sqrt(-b^2 + 4*a*c)*(2*c*e^x + b)/(b^2 - 4*a*c)) +
2*(b^2 - 4*a*c)*x - (b^2 - 4*a*c)*log(c*e^(2*x) + b*e^x + a))/(a*b^2 - 4*a^
2*c)]
```

giac [A] time = 0.34, size = 63, normalized size = 0.94

$$-\frac{b\arctan\left(\frac{2\,ce^x+b}{\sqrt{-b^2+4\,ac}}\right)}{\sqrt{-b^2+4\,ac}\,a}+\frac{x}{a}-\frac{\log\left(ce^{(2\,x)}+be^x+a\right)}{2\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*exp(x)+c*exp(2*x)),x, algorithm="giac")
```

```
[Out] -b*arctan((2*c*e^x + b)/sqrt(-b^2 + 4*a*c))/(sqrt(-b^2 + 4*a*c)*a) + x/a -
1/2*log(c*e^(2*x) + b*e^x + a)/a
```

maple [A] time = 0.02, size = 66, normalized size = 0.99

$$-\frac{b\arctan\left(\frac{2c\,\mathrm{e}^x+b}{\sqrt{4ac-b^2}}\right)}{\sqrt{4ac-b^2}\;a}-\frac{\ln\left(b\,\mathrm{e}^x+c\,\mathrm{e}^{2x}+a\right)}{2a}+\frac{\ln\left(\mathrm{e}^x\right)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a+b*exp(x)+c*exp(2*x)),x)
```

```
[Out] -1/2/a*ln(a+b*exp(x)+c*exp(x)^2)-1/a*b/(4*a*c-b^2)^(1/2)*arctan((b+2*c*exp(
x))/(4*a*c-b^2)^(1/2))+1/a*ln(exp(x))
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*exp(x)+c*exp(2*x)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*a*c-b^2>0)', see `assume?` for mo
re details)Is 4*a*c-b^2 positive or negative?
```

mupad [B] time = 0.23, size = 63, normalized size = 0.94

$$\frac{x}{a}-\frac{\ln\left(a+b\,\mathrm{e}^x+c\,\mathrm{e}^{2\,x}\right)}{2\,a}-\frac{b\,\mathrm{atan}\left(\frac{b+2\,c\,\mathrm{e}^x}{\sqrt{4\,a\,c-b^2}}\right)}{a\,\sqrt{4\,a\,c-b^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a + b*exp(x) + c*exp(2*x)),x)
```

```
[Out] x/a - log(a + b*exp(x) + c*exp(2*x))/(2*a) - (b*atan((b + 2*c*exp(x))/(4*a*
c - b^2)^(1/2)))/(a*(4*a*c - b^2)^(1/2))
```

sympy [A] time = 0.33, size = 63, normalized size = 0.94

$$\operatorname{RootSum}\left(z^2\left(4a^2c-ab^2\right)+z\left(4ac-b^2\right)+c,\left(i\mapsto i\log\left(e^x+\frac{-4ia^2c+iab^2-2ac+b^2}{bc}\right)\right)\right)+\frac{x}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*exp(x)+c*exp(2*x)),x)
```

```
[Out] RootSum(_z**2*(4*a**2*c - a*b**2) + _z*(4*a*c - b**2) + c, Lambda(_i, _i*lo
g(exp(x) + (-4*_i*a**2*c + _i*a*b**2 - 2*a*c + b**2)/(b*c)))) + x/a
```

3.510 $\int \frac{x}{1+2e^x+e^{2x}}\,dx$

Optimal. Leaf size=44

$$-\mathrm{Li}_2\left(-e^x\right)+\frac{x^2}{2}+\frac{x}{e^x+1}-x-x\log\left(e^x+1\right)+\log\left(e^x+1\right)$$

```
[Out] -x+x/(1+exp(x))+1/2*x^2+ln(1+exp(x))-x*ln(1+exp(x))-polylog(2,-exp(x))
```

Rubi [A] time = 0.13, antiderivative size = 44, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 11, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.688, Rules used = {6688, 2185, 2184, 2190, 2279, 2391, 2191, 2282, 36, 29, 31}

$$-\mathrm{PolyLog}\left(2,-e^x\right)+\frac{x^2}{2}+\frac{x}{e^x+1}-x-x\log\left(e^x+1\right)+\log\left(e^x+1\right)$$

Antiderivative was successfully verified.

```
[In] Int[x/(1 + 2*E^x + E^(2*x)),x]
```

```
[Out] -x + x/(1 + E^x) + x^2/2 + Log[1 + E^x] - x*Log[1 + E^x] - PolyLog[2, -E^x]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 2184

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[((c + d*x)^m*(F^(g*(e + f*x)))^n)/(a + b*(F^(g*(e + f*x)))^n), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2185

```
Int[((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.))^(p_)*((c_.) +
(d_.)*(x_))^(m_.), x_Symbol] :> Dist[1/a, Int[(c + d*x)^m*(a + b*(F^(g*(e +
 f*x)))^n)^(p + 1), x], x] - Dist[b/a, Int[(c + d*x)^m*(F^(g*(e + f*x)))^n*
(a + b*(F^(g*(e + f*x)))^n)^p, x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n},
 x] && ILtQ[p, 0] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2191

```
Int[((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((a_.) + (b_.)*((F_)^((g_.)*(
(e_.) + (f_.)*(x_))))^(n_.))^(p_.)*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :>
 Simp[((c + d*x)^m*(a + b*(F^(g*(e + f*x)))^n)^(p + 1))/(b*f*g*n*(p + 1)*Lo
g[F]), x] - Dist[(d*m)/(b*f*g*n*(p + 1)*Log[F]), Int[(c + d*x)^(m - 1)*(a +
 b*(F^(g*(e + f*x)))^n)^(p + 1), x], x] /; FreeQ[{F, a, b, c, d, e, f, g, m
, n, p}, x] && NeQ[p, -1]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rubi steps

$$\begin{aligned}
\int \frac{x}{1+2e^x+e^{2x}}\,dx &= \int \frac{x}{(1+e^x)^2}\,dx \\
&= -\int \frac{e^x x}{(1+e^x)^2}\,dx + \int \frac{x}{1+e^x}\,dx \\
&= \frac{x}{1+e^x} + \frac{x^2}{2} - \int \frac{1}{1+e^x}\,dx - \int \frac{e^x x}{1+e^x}\,dx \\
&= \frac{x}{1+e^x} + \frac{x^2}{2} - x\log(1+e^x) + \int \log(1+e^x)\,dx - \text{Subst}\left(\int \frac{1}{x(1+x)}\,dx, x, e^x\right) \\
&= \frac{x}{1+e^x} + \frac{x^2}{2} - x\log(1+e^x) - \text{Subst}\left(\int \frac{1}{x}\,dx, x, e^x\right) + \text{Subst}\left(\int \frac{1}{1+x}\,dx, x, e^x\right) + \text{Subst} \\
&= -x + \frac{x}{1+e^x} + \frac{x^2}{2} + \log(1+e^x) - x\log(1+e^x) - \text{Li}_2(-e^x)
\end{aligned}$$

Mathematica [A] time = 0.06, size = 38, normalized size = 0.86

$$-\text{Li}_2(-e^x) + \frac{1}{2}x\left(x + \frac{2}{e^x+1} - 2\right) - (x-1)\log(e^x+1)$$

Antiderivative was successfully verified.

```
[In] Integrate[x/(1 + 2*E^x + E^(2*x)),x]
```

```
[Out] (x*(-2 + 2/(1 + E^x) + x))/2 - (-1 + x)*Log[1 + E^x] - PolyLog[2, -E^x]
```

fricas [A] time = 0.41, size = 49, normalized size = 1.11

$$\frac{x^2 - 2(e^x+1)\text{Li}_2(-e^x) + (x^2 - 2x)e^x - 2((x-1)e^x + x - 1)\log(e^x+1)}{2(e^x+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(1+2*exp(x)+exp(2*x)),x, algorithm="fricas")
```

```
[Out] 1/2*(x^2 - 2*(e^x + 1)*dilog(-e^x) + (x^2 - 2*x)*e^x - 2*((x - 1)*e^x + x -
 1)*log(e^x + 1))/(e^x + 1)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{e^{(2x)} + 2e^x + 1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(1+2*exp(x)+exp(2*x)),x, algorithm="giac")
[Out] integrate(x/(e^(2*x) + 2*e^x + 1), x)
```

maple [A] time = 0.02, size = 38, normalized size = 0.86

$$\frac{x^2}{2} - \frac{x\,\mathrm{e}^x}{\mathrm{e}^x + 1} - x\ln(\mathrm{e}^x + 1) - \mathrm{dilog}(\mathrm{e}^x + 1) + \ln(\mathrm{e}^x + 1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(1+2*exp(x)+exp(2*x)),x)
[Out] ln(exp(x)+1)-x*exp(x)/(exp(x)+1)-dilog(exp(x)+1)-x*ln(exp(x)+1)+1/2*x^2
```

maxima [A] time = 0.78, size = 37, normalized size = 0.84

$$\frac{1}{2}x^2 - x\log(e^x + 1) - x + \frac{x}{e^x + 1} - \mathrm{Li}_2(-e^x) + \log(e^x + 1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(1+2*exp(x)+exp(2*x)),x, algorithm="maxima")
[Out] 1/2*x^2 - x*log(e^x + 1) - x + x/(e^x + 1) - dilog(-e^x) + log(e^x + 1)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{x}{\mathrm{e}^{2x} + 2\,\mathrm{e}^x + 1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(exp(2*x) + 2*exp(x) + 1),x)
[Out] int(x/(exp(2*x) + 2*exp(x) + 1), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{x}{e^x + 1} + \int \frac{x - 1}{e^x + 1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(1+2*exp(x)+exp(2*x)),x)
[Out] x/(exp(x) + 1) + Integral((x - 1)/(exp(x) + 1), x)
```

3.511 $\int \frac{x}{2+3e^x+e^{2x}}\,dx$

Optimal. Leaf size=54

$$-\text{Li}_2\left(-e^x\right)+\frac{1}{2}\text{Li}_2\left(-\frac{e^x}{2}\right)+\frac{x^2}{4}+\frac{1}{2}x\log\left(\frac{e^x}{2}+1\right)-x\log\left(e^x+1\right)$$

```
[Out] 1/4*x^2+1/2*x*ln(1+1/2*exp(x))-x*ln(1+exp(x))-polylog(2,-exp(x))+1/2*polylo
g(2,-1/2*exp(x))
```

Rubi [A] time = 0.12, antiderivative size = 54, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 5, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.312, Rules used = {2263, 2184, 2190, 2279, 2391}

$$-\text{PolyLog}\left(2,-e^x\right)+\frac{1}{2}\text{PolyLog}\left(2,-\frac{e^x}{2}\right)+\frac{x^2}{4}+\frac{1}{2}x\log\left(\frac{e^x}{2}+1\right)-x\log\left(e^x+1\right)$$

Antiderivative was successfully verified.

```
[In] Int[x/(2 + 3*E^x + E^(2*x)),x]
```

```
[Out] x^2/4 + (x*Log[1 + E^x/2])/2 - x*Log[1 + E^x] - PolyLog[2, -E^x] + PolyLog[
2, -E^x/2]/2
```

Rule 2184

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[((c + d*x)^m*(F^(g*(e + f*x)))^n)/(a + b*(F^(g*(e + f*x)))^n), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2263

```
Int[((f_.) + (g_.)*(x_))^(m_.)/((a_.) + (b_.)*(F_)^(u_) + (c_.)*(F_)^(v_)),
 x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[(2*c)/q, Int[(f + g*x)^m/
(b - q + 2*c*F^u), x], x] - Dist[(2*c)/q, Int[(f + g*x)^m/(b + q + 2*c*F^u)
, x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v, 2*u] && LinearQ[u, x] &
```

```
& NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}\int \frac{x}{2+3e^x+e^{2x}}\,dx &= 2\int \frac{x}{2+2e^x}\,dx - 2\int \frac{x}{4+2e^x}\,dx\\
&= \frac{x^2}{4} - 2\int \frac{e^x x}{2+2e^x}\,dx + \int \frac{e^x x}{4+2e^x}\,dx\\
&= \frac{x^2}{4} + \frac{1}{2}x\log\left(1+\frac{e^x}{2}\right) - x\log(1+e^x) - \frac{1}{2}\int \log\left(1+\frac{e^x}{2}\right)dx + \int \log(1+e^x)\,dx\\
&= \frac{x^2}{4} + \frac{1}{2}x\log\left(1+\frac{e^x}{2}\right) - x\log(1+e^x) - \frac{1}{2}\text{Subst}\left(\int \frac{\log\left(1+\frac{x}{2}\right)}{x}\,dx, x, e^x\right) + \text{Subst}\left(\int \frac{\log\right.\\
&= \frac{x^2}{4} + \frac{1}{2}x\log\left(1+\frac{e^x}{2}\right) - x\log(1+e^x) - \text{Li}_2(-e^x) + \frac{1}{2}\text{Li}_2\left(-\frac{e^x}{2}\right)\end{aligned}$$

Mathematica [A] time = 0.00, size = 49, normalized size = 0.91

$$-\frac{1}{2}\text{Li}_2\left(-2e^{-x}\right) + \text{Li}_2\left(-e^{-x}\right) - x\log\left(e^{-x}+1\right) + \frac{1}{2}x\log\left(2e^{-x}+1\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x/(2 + 3*E^x + E^(2*x)),x]
```

```
[Out] -(x*Log[1 + E^(-x)]) + (x*Log[1 + 2/E^x])/2 - PolyLog[2, -2/E^x]/2 + PolyLo
g[2, -E^(-x)]
```

fricas [A] time = 0.41, size = 38, normalized size = 0.70

$$\frac{1}{4}\,x^2 - x\log\left(e^x+1\right) + \frac{1}{2}\,x\log\left(\frac{1}{2}\,e^x+1\right) + \frac{1}{2}\,\text{Li}_2\left(-\frac{1}{2}\,e^x\right) - \text{Li}_2\left(-e^x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(2+3*exp(x)+exp(2*x)),x, algorithm="fricas")
```

```
[Out] 1/4*x^2 - x*log(e^x + 1) + 1/2*x*log(1/2*e^x + 1) + 1/2*dilog(-1/2*e^x) - d
ilog(-e^x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{e^{(2x)} + 3e^{x} + 2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(2+3*exp(x)+exp(2*x)),x, algorithm="giac")
```

```
[Out] integrate(x/(e^(2*x) + 3*e^x + 2), x)
```

maple [A] time = 0.02, size = 41, normalized size = 0.76

$$\frac{x^2}{4} - x\ln\left(e^{x}+1\right) + \frac{x\ln\left(\frac{e^{x}}{2}+1\right)}{2} - \operatorname{polylog}\left(2,-e^{x}\right) + \frac{\operatorname{polylog}\left(2,-\frac{e^{x}}{2}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(2+3*exp(x)+exp(2*x)),x)
```

```
[Out] 1/4*x^2+1/2*x*ln(1+1/2*exp(x))-x*ln(exp(x)+1)-polylog(2,-exp(x))+1/2*polylo
g(2,-1/2*exp(x))
```

maxima [A] time = 0.90, size = 38, normalized size = 0.70

$$\frac{1}{4}x^2 - x\log\left(e^{x}+1\right) + \frac{1}{2}x\log\left(\frac{1}{2}e^{x}+1\right) + \frac{1}{2}\operatorname{Li}_2\left(-\frac{1}{2}e^{x}\right) - \operatorname{Li}_2\left(-e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(2+3*exp(x)+exp(2*x)),x, algorithm="maxima")
```

```
[Out] 1/4*x^2 - x*log(e^x + 1) + 1/2*x*log(1/2*e^x + 1) + 1/2*dilog(-1/2*e^x) - d
ilog(-e^x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{x}{e^{2x} + 3e^{x} + 2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(exp(2*x) + 3*exp(x) + 2),x)
```

```
[Out] int(x/(exp(2*x) + 3*exp(x) + 2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{(e^x + 1)(e^x + 2)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(2+3*exp(x)+exp(2*x)),x)
```

```
[Out] Integral(x/((exp(x) + 1)*(exp(x) + 2)), x)
```

3.512 $\int \frac{x}{-1+e^x+e^{2x}}\,dx$

Optimal. Leaf size=180

$$-\frac{2\text{Li}_2\left(-\frac{2e^x}{1-\sqrt{5}}\right)}{\sqrt{5}\left(1-\sqrt{5}\right)}+\frac{2\text{Li}_2\left(-\frac{2e^x}{1+\sqrt{5}}\right)}{\sqrt{5}\left(1+\sqrt{5}\right)}-\frac{x^2}{\sqrt{5}\left(1+\sqrt{5}\right)}+\frac{x^2}{\sqrt{5}\left(1-\sqrt{5}\right)}-\frac{2x\log\left(\frac{2e^x}{1-\sqrt{5}}+1\right)}{\sqrt{5}\left(1-\sqrt{5}\right)}+\frac{2x\log\left(\frac{2e^x}{1+\sqrt{5}}+1\right)}{\sqrt{5}\left(1+\sqrt{5}\right)}$$

```
[Out] 1/5*x^2/(-5^(1/2)+1)*5^(1/2)-2/5*x*ln(1+2*exp(x)/(-5^(1/2)+1))/(-5^(1/2)+1)
*5^(1/2)-2/5*polylog(2,-2*exp(x)/(-5^(1/2)+1))/(-5^(1/2)+1)*5^(1/2)-1/5*x^2
*5^(1/2)/(5^(1/2)+1)+2/5*x*ln(1+2*exp(x)/(5^(1/2)+1))*5^(1/2)/(5^(1/2)+1)+2
/5*polylog(2,-2*exp(x)/(5^(1/2)+1))*5^(1/2)/(5^(1/2)+1)
```

Rubi [A] time = 0.19, antiderivative size = 180, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 5, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.357, Rules used = {2263, 2184, 2190, 2279, 2391}

$$-\frac{2\text{PolyLog}\left(2,-\frac{2e^x}{1-\sqrt{5}}\right)}{\sqrt{5}\left(1-\sqrt{5}\right)}+\frac{2\text{PolyLog}\left(2,-\frac{2e^x}{1+\sqrt{5}}\right)}{\sqrt{5}\left(1+\sqrt{5}\right)}-\frac{x^2}{\sqrt{5}\left(1+\sqrt{5}\right)}+\frac{x^2}{\sqrt{5}\left(1-\sqrt{5}\right)}-\frac{2x\log\left(\frac{2e^x}{1-\sqrt{5}}+1\right)}{\sqrt{5}\left(1-\sqrt{5}\right)}+\frac{2x\log\left(\frac{2e^x}{1+\sqrt{5}}\right.}{\sqrt{5}\left(1+\right.}$$

Antiderivative was successfully verified.

```
[In] Int[x/(-1 + E^x + E^(2*x)),x]
```

```
[Out] x^2/(Sqrt[5]*(1 - Sqrt[5])) - x^2/(Sqrt[5]*(1 + Sqrt[5])) - (2*x*Log[1 + (2
*E^x)/(1 - Sqrt[5])])/(Sqrt[5]*(1 - Sqrt[5])) + (2*x*Log[1 + (2*E^x)/(1 + S
qrt[5])])/(Sqrt[5]*(1 + Sqrt[5])) - (2*PolyLog[2, (-2*E^x)/(1 - Sqrt[5])])/
(Sqrt[5]*(1 - Sqrt[5])) + (2*PolyLog[2, (-2*E^x)/(1 + Sqrt[5])])/(Sqrt[5]*(
1 + Sqrt[5]))
```

Rule 2184

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[((c + d*x)^m*(F^(g*(e + f*x)))^n)/(a + b*(F^(g*(e + f*x)))^n), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2263

```
Int[((f_.) + (g_.)*(x_))^(m_.)/((a_.) + (b_.)*(F_)^(u_) + (c_.)*(F_)^(v_)),
 x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[(2*c)/q, Int[(f + g*x)^m/
(b - q + 2*c*F^u), x], x] - Dist[(2*c)/q, Int[(f + g*x)^m/(b + q + 2*c*F^u)
, x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v, 2*u] && LinearQ[u, x] &
& NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x}{-1+e^x+e^{2x}}\,dx = \frac{2\int \frac{x}{1-\sqrt{5}+2e^x}\,dx}{\sqrt{5}} - \frac{2\int \frac{x}{1+\sqrt{5}+2e^x}\,dx}{\sqrt{5}}$$

$$= \frac{x^2}{\sqrt{5}\left(1-\sqrt{5}\right)} - \frac{x^2}{\sqrt{5}\left(1+\sqrt{5}\right)} - \frac{4\int \frac{e^x x}{1-\sqrt{5}+2e^x}\,dx}{\sqrt{5}\left(1-\sqrt{5}\right)} + \frac{4\int \frac{e^x x}{1+\sqrt{5}+2e^x}\,dx}{\sqrt{5}\left(1+\sqrt{5}\right)}$$

$$= \frac{x^2}{\sqrt{5}\left(1-\sqrt{5}\right)} - \frac{x^2}{\sqrt{5}\left(1+\sqrt{5}\right)} - \frac{2x\log\left(1+\frac{2e^x}{1-\sqrt{5}}\right)}{\sqrt{5}\left(1-\sqrt{5}\right)} + \frac{2x\log\left(1+\frac{2e^x}{1+\sqrt{5}}\right)}{\sqrt{5}\left(1+\sqrt{5}\right)} + \frac{2\int \log\left(1+\cdots\right.}{\sqrt{5}\left(1-\cdots\right.}$$

$$= \frac{x^2}{\sqrt{5}\left(1-\sqrt{5}\right)} - \frac{x^2}{\sqrt{5}\left(1+\sqrt{5}\right)} - \frac{2x\log\left(1+\frac{2e^x}{1-\sqrt{5}}\right)}{\sqrt{5}\left(1-\sqrt{5}\right)} + \frac{2x\log\left(1+\frac{2e^x}{1+\sqrt{5}}\right)}{\sqrt{5}\left(1+\sqrt{5}\right)} + \frac{2\,\mathrm{Subst}\left(\int \cdots\right.}{\sqrt{5}\cdots}$$

$$= \frac{x^2}{\sqrt{5}\left(1-\sqrt{5}\right)} - \frac{x^2}{\sqrt{5}\left(1+\sqrt{5}\right)} - \frac{2x\log\left(1+\frac{2e^x}{1-\sqrt{5}}\right)}{\sqrt{5}\left(1-\sqrt{5}\right)} + \frac{2x\log\left(1+\frac{2e^x}{1+\sqrt{5}}\right)}{\sqrt{5}\left(1+\sqrt{5}\right)} - \frac{2\mathrm{Li}_2\left(-\frac{2e^x}{1-\sqrt{5}}\cdots\right.}{\sqrt{5}\left(1-\sqrt{5}\right)\cdots}$$

Mathematica [A] time = 0.11, size = 120, normalized size = 0.67

$$\frac{-\left(1+\sqrt{5}\right)\text{Li}_2\left(\frac{1}{2}\left(-1+\sqrt{5}\right)e^{-x}\right)-\left(\sqrt{5}-1\right)\text{Li}_2\left(-\frac{1}{2}\left(1+\sqrt{5}\right)e^{-x}\right)+\left(1+\sqrt{5}\right)x\log\left(1-\frac{1}{2}\left(\sqrt{5}-1\right)e^{-x}\right)+\left(\sqrt{\right.}}{2\sqrt{5}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x/(-1 + E^x + E^(2*x)),x]
```

```
[Out] ((1 + Sqrt[5])*x*Log[1 - (-1 + Sqrt[5])/(2*E^x)] + (-1 + Sqrt[5])*x*Log[1 +
 (1 + Sqrt[5])/(2*E^x)] - (1 + Sqrt[5])*PolyLog[2, (-1 + Sqrt[5])/(2*E^x)]
- (-1 + Sqrt[5])*PolyLog[2, -1/2*(1 + Sqrt[5])/E^x])/(2*Sqrt[5])
```

fricas [A] time = 0.45, size = 86, normalized size = 0.48

$$-\frac{1}{2}x^2+\frac{1}{10}\left(\sqrt{5}+5\right)\text{Li}_2\left(\frac{1}{2}\left(\sqrt{5}+1\right)e^x\right)-\frac{1}{10}\left(\sqrt{5}-5\right)\text{Li}_2\left(-\frac{1}{2}\left(\sqrt{5}-1\right)e^x\right)+\frac{1}{10}\left(\sqrt{5}x+5x\right)\log\left(-\frac{1}{2}\left(\sqrt{5}+1\right)e^x\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-1+exp(x)+exp(2*x)),x, algorithm="fricas")
```

```
[Out] -1/2*x^2 + 1/10*(sqrt(5) + 5)*dilog(1/2*(sqrt(5) + 1)*e^x) - 1/10*(sqrt(5)
- 5)*dilog(-1/2*(sqrt(5) - 1)*e^x) + 1/10*(sqrt(5)*x + 5*x)*log(-1/2*(sqrt(
5) + 1)*e^x + 1) - 1/10*(sqrt(5)*x - 5*x)*log(1/2*(sqrt(5) - 1)*e^x + 1)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{e^{(2x)}+e^x-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-1+exp(x)+exp(2*x)),x, algorithm="giac")
```

```
[Out] integrate(x/(e^(2*x) + e^x - 1), x)
```

maple [A] time = 0.02, size = 183, normalized size = 1.02

$$-\frac{x^2}{2}-\frac{\sqrt{5}\,x\ln\left(\frac{2\,e^x+1+\sqrt{5}}{\sqrt{5}+1}\right)}{10}+\frac{x\ln\left(\frac{2\,e^x+1+\sqrt{5}}{\sqrt{5}+1}\right)}{2}+\frac{\sqrt{5}\,x\ln\left(\frac{-2\,e^x+\sqrt{5}-1}{\sqrt{5}-1}\right)}{10}+\frac{x\ln\left(\frac{-2\,e^x+\sqrt{5}-1}{\sqrt{5}-1}\right)}{2}-\frac{\sqrt{5}\,\operatorname{dilog}\left(\frac{2\,e^x+1+\sqrt{5}}{\sqrt{5}+1}\right)}{10}+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(exp(x)+exp(2*x)-1),x)
```

```
[Out] 1/10*5^(1/2)*x*ln((5^(1/2)-1-2*exp(x))/(5^(1/2)-1))+1/2*x*ln((5^(1/2)-1-2*e
xp(x))/(5^(1/2)-1))-1/10*5^(1/2)*x*ln((1+2*exp(x)+5^(1/2))/(5^(1/2)+1))+1/2
*x*ln((1+2*exp(x)+5^(1/2))/(5^(1/2)+1))+1/10*5^(1/2)*dilog((5^(1/2)-1-2*exp
(x))/(5^(1/2)-1))+1/2*dilog((5^(1/2)-1-2*exp(x))/(5^(1/2)-1))-1/10*5^(1/2)*
dilog((1+2*exp(x)+5^(1/2))/(5^(1/2)+1))+1/2*dilog((1+2*exp(x)+5^(1/2))/(5^(
1/2)+1))-1/2*x^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{e^{(2x)} + e^{x} - 1}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-1+exp(x)+exp(2*x)),x, algorithm="maxima")
```

```
[Out] integrate(x/(e^(2*x) + e^x - 1), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x}{\mathrm{e}^{2x} + \mathrm{e}^{x} - 1}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(exp(2*x) + exp(x) - 1),x)
```

```
[Out] int(x/(exp(2*x) + exp(x) - 1), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{e^{2x} + e^{x} - 1}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-1+exp(x)+exp(2*x)),x)
```

```
[Out] Integral(x/(exp(2*x) + exp(x) - 1), x)
```

3.513 $\int \frac{x}{3+3e^x+e^{2x}}\,dx$

Optimal. Leaf size=204

$$-\frac{2\text{Li}_2\left(-\frac{2e^x}{3-i\sqrt{3}}\right)}{\sqrt{3}\left(\sqrt{3}+3i\right)}+\frac{2\text{Li}_2\left(-\frac{2e^x}{3+i\sqrt{3}}\right)}{\sqrt{3}\left(-\sqrt{3}+3i\right)}+\frac{x^2}{\sqrt{3}\left(\sqrt{3}+3i\right)}-\frac{x^2}{\sqrt{3}\left(-\sqrt{3}+3i\right)}-\frac{2x\log\left(1+\frac{2e^x}{3-i\sqrt{3}}\right)}{\sqrt{3}\left(\sqrt{3}+3i\right)}+\frac{2x\log\left(1+\frac{2e^x}{3+i\sqrt{3}}\right)}{\sqrt{3}\left(-\sqrt{3}+3i\right)}$$

```
[Out] -1/3*x^2/(3*I-3^(1/2))*3^(1/2)+2/3*x*ln(1+2*exp(x)/(3+I*3^(1/2)))/(3*I-3^(1
/2))*3^(1/2)+2/3*polylog(2,-2*exp(x)/(3+I*3^(1/2)))/(3*I-3^(1/2))*3^(1/2)+1
/3*x^2*3^(1/2)/(3*I+3^(1/2))-2/3*x*ln(1+2*exp(x)/(3-I*3^(1/2)))*3^(1/2)/(3*
I+3^(1/2))-2/3*polylog(2,-2*exp(x)/(3-I*3^(1/2)))*3^(1/2)/(3*I+3^(1/2))
```

Rubi [A] time = 0.20, antiderivative size = 204, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 5, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.312, Rules used = {2263, 2184, 2190, 2279, 2391}

$$-\frac{2\text{PolyLog}\left(2,-\frac{2e^x}{3-i\sqrt{3}}\right)}{\sqrt{3}\left(\sqrt{3}+3i\right)}+\frac{2\text{PolyLog}\left(2,-\frac{2e^x}{3+i\sqrt{3}}\right)}{\sqrt{3}\left(-\sqrt{3}+3i\right)}+\frac{x^2}{\sqrt{3}\left(\sqrt{3}+3i\right)}-\frac{x^2}{\sqrt{3}\left(-\sqrt{3}+3i\right)}-\frac{2x\log\left(1+\frac{2e^x}{3-i\sqrt{3}}\right)}{\sqrt{3}\left(\sqrt{3}+3i\right)}+\frac{2x\log(}{\sqrt{3}\,(-}$$

Antiderivative was successfully verified.

```
[In] Int[x/(3 + 3*E^x + E^(2*x)),x]
```

```
[Out] -(x^2/(Sqrt[3]*(3*I - Sqrt[3]))) + x^2/(Sqrt[3]*(3*I + Sqrt[3])) - (2*x*Log
[1 + (2*E^x)/(3 - I*Sqrt[3])])/(Sqrt[3]*(3*I + Sqrt[3])) + (2*x*Log[1 + (2*
E^x)/(3 + I*Sqrt[3])])/(Sqrt[3]*(3*I - Sqrt[3])) - (2*PolyLog[2, (-2*E^x)/(
3 - I*Sqrt[3])])/(Sqrt[3]*(3*I + Sqrt[3])) + (2*PolyLog[2, (-2*E^x)/(3 + I*
Sqrt[3])])/(Sqrt[3]*(3*I - Sqrt[3]))
```

Rule 2184

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[((c + d*x)^m*(F^(g*(e + f*x)))^n)/(a + b*(F^(g*(e + f*x)))^n), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2263

```
Int[((f_.) + (g_.)*(x_))^(m_.)/((a_.) + (b_.)*(F_)^(u_) + (c_.)*(F_)^(v_)),
 x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[(2*c)/q, Int[(f + g*x)^m/
(b - q + 2*c*F^u), x], x] - Dist[(2*c)/q, Int[(f + g*x)^m/(b + q + 2*c*F^u)
, x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v, 2*u] && LinearQ[u, x] &
& NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x}{3+3e^x+e^{2x}}\,dx = -\frac{(2i)\int \frac{x}{3-i\sqrt{3}+2e^x}\,dx}{\sqrt{3}} + \frac{(2i)\int \frac{x}{3+i\sqrt{3}+2e^x}\,dx}{\sqrt{3}}$$

$$= -\frac{x^2}{\sqrt{3}\left(3i-\sqrt{3}\right)} + \frac{x^2}{\sqrt{3}\left(3i+\sqrt{3}\right)} + \frac{(4i)\int \frac{e^x x}{3-i\sqrt{3}+2e^x}\,dx}{\sqrt{3}\left(3-i\sqrt{3}\right)} - \frac{(4i)\int \frac{e^x x}{3+i\sqrt{3}+2e^x}\,dx}{\sqrt{3}\left(3+i\sqrt{3}\right)}$$

$$= -\frac{x^2}{\sqrt{3}\left(3i-\sqrt{3}\right)} + \frac{x^2}{\sqrt{3}\left(3i+\sqrt{3}\right)} - \frac{2x\log\left(1+\frac{2e^x}{3-i\sqrt{3}}\right)}{\sqrt{3}\left(3i+\sqrt{3}\right)} + \frac{2x\log\left(1+\frac{2e^x}{3+i\sqrt{3}}\right)}{\sqrt{3}\left(3i-\sqrt{3}\right)} - \frac{(2i)\int \log}{\sqrt{3}}$$

$$= -\frac{x^2}{\sqrt{3}\left(3i-\sqrt{3}\right)} + \frac{x^2}{\sqrt{3}\left(3i+\sqrt{3}\right)} - \frac{2x\log\left(1+\frac{2e^x}{3-i\sqrt{3}}\right)}{\sqrt{3}\left(3i+\sqrt{3}\right)} + \frac{2x\log\left(1+\frac{2e^x}{3+i\sqrt{3}}\right)}{\sqrt{3}\left(3i-\sqrt{3}\right)} - \frac{(2i)\,\mathrm{Subs}}{}$$

$$= -\frac{x^2}{\sqrt{3}\left(3i-\sqrt{3}\right)} + \frac{x^2}{\sqrt{3}\left(3i+\sqrt{3}\right)} - \frac{2x\log\left(1+\frac{2e^x}{3-i\sqrt{3}}\right)}{\sqrt{3}\left(3i+\sqrt{3}\right)} + \frac{2x\log\left(1+\frac{2e^x}{3+i\sqrt{3}}\right)}{\sqrt{3}\left(3i-\sqrt{3}\right)} - \frac{2\mathrm{Li}_2\left(-\frac{}{3}\right.}{\sqrt{3}\left(3i+\right.}$$

Mathematica [A] time = 0.10, size = 144, normalized size = 0.71

$$\frac{\left(\sqrt{3}+3i\right)\text{Li}_2\left(-\frac{1}{2}i\left(-3i+\sqrt{3}\right)e^{-x}\right)+\left(\sqrt{3}-3i\right)\text{Li}_2\left(\frac{1}{2}i\left(3i+\sqrt{3}\right)e^{-x}\right)-x\left(\left(\sqrt{3}-3i\right)\log\left(1+\frac{1}{2}\left(3-i\sqrt{3}\right)e^{-x}\right)\right.}{6\sqrt{3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x/(3 + 3*E^x + E^(2*x)),x]
```

```
[Out] (-(x*((-3*I + Sqrt[3])*Log[1 + (3 - I*Sqrt[3])/(2*E^x)] + (3*I + Sqrt[3])*L
og[1 + (3 + I*Sqrt[3])/(2*E^x)])) + (3*I + Sqrt[3])*PolyLog[2, ((-1/2*I)*(-
3*I + Sqrt[3]))/E^x] + (-3*I + Sqrt[3])*PolyLog[2, ((I/2)*(3*I + Sqrt[3]))/
E^x])/(6*Sqrt[3])
```

fricas [A] time = 0.44, size = 100, normalized size = 0.49

$$\frac{1}{6}x^2+\frac{1}{6}\left(i\sqrt{3}-1\right)\text{Li}_2\left(-\frac{1}{6}\left(i\sqrt{3}+3\right)e^x\right)+\frac{1}{6}\left(-i\sqrt{3}-1\right)\text{Li}_2\left(-\frac{1}{6}\left(-i\sqrt{3}+3\right)e^x\right)+\frac{1}{6}\left(i\sqrt{3}x-x\right)\log\left(\frac{1}{6}\left(i\sqrt{3}+3\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(3+3*exp(x)+exp(2*x)),x, algorithm="fricas")
```

```
[Out] 1/6*x^2 + 1/6*(I*sqrt(3) - 1)*dilog(-1/6*(I*sqrt(3) + 3)*e^x) + 1/6*(-I*sqr
t(3) - 1)*dilog(-1/6*(-I*sqrt(3) + 3)*e^x) + 1/6*(I*sqrt(3)*x - x)*log(1/6*
(I*sqrt(3) + 3)*e^x + 1) + 1/6*(-I*sqrt(3)*x - x)*log(1/6*(-I*sqrt(3) + 3)*
e^x + 1)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{e^{(2x)}+3e^x+3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(3+3*exp(x)+exp(2*x)),x, algorithm="giac")
```

```
[Out] integrate(x/(e^(2*x) + 3*e^x + 3), x)
```

maple [A] time = 0.02, size = 235, normalized size = 1.15

$$\frac{x^2}{6}+\frac{i\sqrt{3}\,x\ln\left(\frac{-2\,\mathrm{e}^x+i\sqrt{3}-3}{-3+i\sqrt{3}}\right)}{6}-\frac{x\ln\left(\frac{-2\,\mathrm{e}^x+i\sqrt{3}-3}{-3+i\sqrt{3}}\right)}{6}-\frac{i\sqrt{3}\,x\ln\left(\frac{2\,\mathrm{e}^x+i\sqrt{3}+3}{3+i\sqrt{3}}\right)}{6}-\frac{x\ln\left(\frac{2\,\mathrm{e}^x+i\sqrt{3}+3}{3+i\sqrt{3}}\right)}{6}+\frac{i\sqrt{3}\,\operatorname{dilog}\left(\frac{-2\,\mathrm{e}^x+i\sqrt{3}-3}{-3+i\sqrt{3}}\right.}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(3*exp(x)+exp(2*x)+3),x)
```

```
[Out] 1/6*I*3^(1/2)*x*ln((I*3^(1/2)-2*exp(x)-3)/(-3+I*3^(1/2)))-1/6*x*ln((I*3^(1/
2)-2*exp(x)-3)/(-3+I*3^(1/2)))-1/6*I*3^(1/2)*x*ln((I*3^(1/2)+2*exp(x)+3)/(3
+I*3^(1/2)))-1/6*x*ln((I*3^(1/2)+2*exp(x)+3)/(3+I*3^(1/2)))+1/6*I*3^(1/2)*d
ilog((I*3^(1/2)-2*exp(x)-3)/(-3+I*3^(1/2)))-1/6*dilog((I*3^(1/2)-2*exp(x)-3
)/(-3+I*3^(1/2)))-1/6*I*3^(1/2)*dilog((I*3^(1/2)+2*exp(x)+3)/(3+I*3^(1/2)))
-1/6*dilog((I*3^(1/2)+2*exp(x)+3)/(3+I*3^(1/2)))+1/6*x^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{e^{(2x)} + 3e^{x} + 3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(3+3*exp(x)+exp(2*x)),x, algorithm="maxima")
```

```
[Out] integrate(x/(e^(2*x) + 3*e^x + 3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x}{\mathrm{e}^{2x} + 3\,\mathrm{e}^{x} + 3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(exp(2*x) + 3*exp(x) + 3),x)
```

```
[Out] int(x/(exp(2*x) + 3*exp(x) + 3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{e^{2x} + 3e^{x} + 3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(3+3*exp(x)+exp(2*x)),x)
```

```
[Out] Integral(x/(exp(2*x) + 3*exp(x) + 3), x)
```

3.514 $\int \frac{x}{a+be^x+ce^{2x}}\,dx$

Optimal. Leaf size=276

$$\frac{2c\mathrm{Li}_2\left(-\frac{2ce^x}{b-\sqrt{b^2-4ac}}\right)}{-b\sqrt{b^2-4ac}-4ac+b^2}+\frac{2c\mathrm{Li}_2\left(-\frac{2ce^x}{b+\sqrt{b^2-4ac}}\right)}{b\sqrt{b^2-4ac}-4ac+b^2}-\frac{cx^2}{-b\sqrt{b^2-4ac}-4ac+b^2}-\frac{cx^2}{b\sqrt{b^2-4ac}-4ac+b^2}+\frac{2cx\log\left(\cdots\right.}{-b\sqrt{b^2-4\cdots}}$$

```
[Out] -c*x^2/(b^2-4*a*c-b*(-4*a*c+b^2)^(1/2))+2*c*x*ln(1+2*c*exp(x)/(b-(-4*a*c+b^
2)^(1/2)))/(b^2-4*a*c-b*(-4*a*c+b^2)^(1/2))+2*c*polylog(2,-2*c*exp(x)/(b-(-
4*a*c+b^2)^(1/2)))/(b^2-4*a*c-b*(-4*a*c+b^2)^(1/2))-c*x^2/(b^2-4*a*c+b*(-4*
a*c+b^2)^(1/2))+2*c*x*ln(1+2*c*exp(x)/(b+(-4*a*c+b^2)^(1/2)))/(b^2-4*a*c+b*
(-4*a*c+b^2)^(1/2))+2*c*polylog(2,-2*c*exp(x)/(b+(-4*a*c+b^2)^(1/2)))/(b^2-
4*a*c+b*(-4*a*c+b^2)^(1/2))
```

Rubi [A] time = 0.43, antiderivative size = 276, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 5, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.278, Rules used = {2263, 2184, 2190, 2279, 2391}

$$\frac{2c\text{PolyLog}\left(2,-\frac{2ce^x}{b-\sqrt{b^2-4ac}}\right)}{-b\sqrt{b^2-4ac}-4ac+b^2}+\frac{2c\text{PolyLog}\left(2,-\frac{2ce^x}{\sqrt{b^2-4ac}+b}\right)}{b\sqrt{b^2-4ac}-4ac+b^2}-\frac{cx^2}{-b\sqrt{b^2-4ac}-4ac+b^2}-\frac{cx^2}{b\sqrt{b^2-4ac}-4ac+b^2}+\frac{2c\cdots}{-b\cdots}$$

Antiderivative was successfully verified.

```
[In] Int[x/(a + b*E^x + c*E^(2*x)),x]
```

```
[Out] -((c*x^2)/(b^2 - 4*a*c - b*Sqrt[b^2 - 4*a*c])) - (c*x^2)/(b^2 - 4*a*c + b*S
qrt[b^2 - 4*a*c]) + (2*c*x*Log[1 + (2*c*E^x)/(b - Sqrt[b^2 - 4*a*c])])/(b^2
 - 4*a*c - b*Sqrt[b^2 - 4*a*c]) + (2*c*x*Log[1 + (2*c*E^x)/(b + Sqrt[b^2 -
4*a*c])])/(b^2 - 4*a*c + b*Sqrt[b^2 - 4*a*c]) + (2*c*PolyLog[2, (-2*c*E^x)/
(b - Sqrt[b^2 - 4*a*c])])/(b^2 - 4*a*c - b*Sqrt[b^2 - 4*a*c]) + (2*c*PolyLo
g[2, (-2*c*E^x)/(b + Sqrt[b^2 - 4*a*c])])/(b^2 - 4*a*c + b*Sqrt[b^2 - 4*a*c
])
```

Rule 2184

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[((c + d*x)^m*(F^(g*(e + f*x)))^n)/(a + b*(F^(g*(e + f*x)))^n), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
```

```
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2263

```
Int[((f_.) + (g_.)*(x_))^(m_.)/((a_.) + (b_.)*(F_)^(u_) + (c_.)*(F_)^(v_)),
 x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[(2*c)/q, Int[(f + g*x)^m/
(b - q + 2*c*F^u), x], x] - Dist[(2*c)/q, Int[(f + g*x)^m/(b + q + 2*c*F^u)
, x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v, 2*u] && LinearQ[u, x] &
& NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x}{a+be^x+ce^{2x}}\,dx = \frac{(2c)\int \frac{x}{b-\sqrt{b^2-4ac}+2ce^x}\,dx}{\sqrt{b^2-4ac}} - \frac{(2c)\int \frac{x}{b+\sqrt{b^2-4ac}+2ce^x}\,dx}{\sqrt{b^2-4ac}}$$

$$= -\frac{cx^2}{b^2-4ac-b\sqrt{b^2-4ac}} - \frac{cx^2}{b^2-4ac+b\sqrt{b^2-4ac}} + \frac{\left(4c^2\right)\int \frac{e^x x}{b-\sqrt{b^2-4ac}+2ce^x}\,dx}{b^2-4ac-b\sqrt{b^2-4ac}} + \frac{\left(4c^2\right)\int}{b^2-4}$$

$$= -\frac{cx^2}{b^2-4ac-b\sqrt{b^2-4ac}} - \frac{cx^2}{b^2-4ac+b\sqrt{b^2-4ac}} + \frac{2cx\log\left(1+\frac{2ce^x}{b-\sqrt{b^2-4ac}}\right)}{b^2-4ac-b\sqrt{b^2-4ac}} + \frac{2cx\log}{b^2-4ac}$$

$$= -\frac{cx^2}{b^2-4ac-b\sqrt{b^2-4ac}} - \frac{cx^2}{b^2-4ac+b\sqrt{b^2-4ac}} + \frac{2cx\log\left(1+\frac{2ce^x}{b-\sqrt{b^2-4ac}}\right)}{b^2-4ac-b\sqrt{b^2-4ac}} + \frac{2cx\log}{b^2-4ac}$$

$$= -\frac{cx^2}{b^2-4ac-b\sqrt{b^2-4ac}} - \frac{cx^2}{b^2-4ac+b\sqrt{b^2-4ac}} + \frac{2cx\log\left(1+\frac{2ce^x}{b-\sqrt{b^2-4ac}}\right)}{b^2-4ac-b\sqrt{b^2-4ac}} + \frac{2cx\log}{b^2-4ac}$$

Mathematica [A] time = 0.22, size = 205, normalized size = 0.74

$$\frac{-\left(\sqrt{b^2-4ac}+b\right)\mathrm{Li}_2\left(\frac{2ce^x}{\sqrt{b^2-4ac}-b}\right)+\left(b-\sqrt{b^2-4ac}\right)\mathrm{Li}_2\left(-\frac{2ce^x}{b+\sqrt{b^2-4ac}}\right)+x\left(x\sqrt{b^2-4ac}-\left(\sqrt{b^2-4ac}+b\right)\log\left(\right.\right.}{2a\sqrt{b^2-4ac}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x/(a + b*E^x + c*E^(2*x)),x]
```

```
[Out] (x*(Sqrt[b^2 - 4*a*c]*x - (b + Sqrt[b^2 - 4*a*c])*Log[1 + (2*c*E^x)/(b - Sq
rt[b^2 - 4*a*c])] + (b - Sqrt[b^2 - 4*a*c])*Log[1 + (2*c*E^x)/(b + Sqrt[b^2
 - 4*a*c])]) - (b + Sqrt[b^2 - 4*a*c])*PolyLog[2, (2*c*E^x)/(-b + Sqrt[b^2
- 4*a*c])] + (b - Sqrt[b^2 - 4*a*c])*PolyLog[2, (-2*c*E^x)/(b + Sqrt[b^2 -
4*a*c])])/(2*a*Sqrt[b^2 - 4*a*c])
```

fricas [A] time = 0.43, size = 280, normalized size = 1.01

$$\frac{\left(b^2-4\,ac\right)x^2-\left(ab\sqrt{\frac{b^2-4\,ac}{a^2}}+b^2-4\,ac\right)\mathrm{Li}_2\left(-\frac{a\sqrt{\frac{b^2-4\,ac}{a^2}}\,e^x+be^x+2\,a}{2\,a}+1\right)+\left(ab\sqrt{\frac{b^2-4\,ac}{a^2}}-b^2+4\,ac\right)\mathrm{Li}_2\left(\frac{a\sqrt{\frac{b^2-4\,ac}{a^2}}\,e^x-b}{2\,a}\right.}{2\left(\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a+b*exp(x)+c*exp(2*x)),x, algorithm="fricas")
```

```
[Out] 1/2*((b^2 - 4*a*c)*x^2 - (a*b*sqrt((b^2 - 4*a*c)/a^2) + b^2 - 4*a*c)*dilog(
-1/2*(a*sqrt((b^2 - 4*a*c)/a^2)*e^x + b*e^x + 2*a)/a + 1) + (a*b*sqrt((b^2
- 4*a*c)/a^2) - b^2 + 4*a*c)*dilog(1/2*(a*sqrt((b^2 - 4*a*c)/a^2)*e^x - b*e
^x - 2*a)/a + 1) - (a*b*x*sqrt((b^2 - 4*a*c)/a^2) + (b^2 - 4*a*c)*x)*log(1/
2*(a*sqrt((b^2 - 4*a*c)/a^2)*e^x + b*e^x + 2*a)/a) + (a*b*x*sqrt((b^2 - 4*a
*c)/a^2) - (b^2 - 4*a*c)*x)*log(-1/2*(a*sqrt((b^2 - 4*a*c)/a^2)*e^x - b*e^x
 - 2*a)/a))/(a*b^2 - 4*a^2*c)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{ce^{(2\,x)}+be^x+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a+b*exp(x)+c*exp(2*x)),x, algorithm="giac")
```

```
[Out] integrate(x/(c*e^(2*x) + b*e^x + a), x)
```

maple [A] time = 0.02, size = 378, normalized size = 1.37

$$-\frac{bx\ln\left(\frac{-2c\,e^{x}-b+\sqrt{-4ac+b^{2}}}{-b+\sqrt{-4ac+b^{2}}}\right)}{2\sqrt{-4ac+b^{2}}\,a}+\frac{bx\ln\left(\frac{2c\,e^{x}+b+\sqrt{-4ac+b^{2}}}{b+\sqrt{-4ac+b^{2}}}\right)}{2\sqrt{-4ac+b^{2}}\,a}-\frac{b\,\mathrm{dilog}\left(\frac{-2c\,e^{x}-b+\sqrt{-4ac+b^{2}}}{-b+\sqrt{-4ac+b^{2}}}\right)}{2\sqrt{-4ac+b^{2}}\,a}+\frac{b\,\mathrm{dilog}\left(\frac{2c\,e^{x}+b+\sqrt{-4ac+b^{2}}}{b+\sqrt{-4ac+b^{2}}}\right)}{2\sqrt{-4ac+b^{2}}\,a}+\frac{x}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(b*exp(x)+c*exp(2*x)+a),x)
```

```
[Out] -1/2/a*x*ln((-2*c*exp(x)+(-4*a*c+b^2)^(1/2)-b)/(-b+(-4*a*c+b^2)^(1/2)))-1/2
/a*x/(-4*a*c+b^2)^(1/2)*ln((-2*c*exp(x)+(-4*a*c+b^2)^(1/2)-b)/(-b+(-4*a*c+b
^2)^(1/2)))*b-1/2/a*x*ln((2*c*exp(x)+(-4*a*c+b^2)^(1/2)+b)/(b+(-4*a*c+b^2)^
(1/2)))+1/2/a*x/(-4*a*c+b^2)^(1/2)*ln((2*c*exp(x)+(-4*a*c+b^2)^(1/2)+b)/(b+
(-4*a*c+b^2)^(1/2)))*b-1/2/a*dilog((2*c*exp(x)+(-4*a*c+b^2)^(1/2)+b)/(b+(-4
*a*c+b^2)^(1/2)))+1/2/a/(-4*a*c+b^2)^(1/2)*dilog((2*c*exp(x)+(-4*a*c+b^2)^(
1/2)+b)/(b+(-4*a*c+b^2)^(1/2)))*b-1/2/a*dilog((-2*c*exp(x)+(-4*a*c+b^2)^(1/
2)-b)/(-b+(-4*a*c+b^2)^(1/2)))-1/2/a/(-4*a*c+b^2)^(1/2)*dilog((-2*c*exp(x)+
(-4*a*c+b^2)^(1/2)-b)/(-b+(-4*a*c+b^2)^(1/2)))*b+1/2/a*x^2
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a+b*exp(x)+c*exp(2*x)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*a*c-b^2>0)', see `assume?` for mo
re details)Is 4*a*c-b^2 positive or negative?
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x}{a+b\,e^{x}+c\,e^{2\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a + b*exp(x) + c*exp(2*x)),x)
```

```
[Out] int(x/(a + b*exp(x) + c*exp(2*x)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{a+be^{x}+ce^{2x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a+b*exp(x)+c*exp(2*x)),x)
```

```
[Out] Integral(x/(a + b*exp(x) + c*exp(2*x)), x)
```

3.515 $\int \frac{x^2}{1+2e^x+e^{2x}}\,dx$

Optimal. Leaf size=72

$$-2x\text{Li}_2\left(-e^x\right)+2\text{Li}_2\left(-e^x\right)+2\text{Li}_3\left(-e^x\right)+\frac{x^3}{3}+\frac{x^2}{e^x+1}-x^2-x^2\log\left(e^x+1\right)+2x\log\left(e^x+1\right)$$

```
[Out] -x^2+x^2/(1+exp(x))+1/3*x^3+2*x*ln(1+exp(x))-x^2*ln(1+exp(x))+2*polylog(2,-
exp(x))-2*x*polylog(2,-exp(x))+2*polylog(3,-exp(x))
```

Rubi [A] time = 0.23, antiderivative size = 72, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 10, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.556, Rules used = {6688, 2185, 2184, 2190, 2531, 2282, 6589, 2191, 2279, 2391}

$$-2x\text{PolyLog}\left(2,-e^x\right)+2\text{PolyLog}\left(2,-e^x\right)+2\text{PolyLog}\left(3,-e^x\right)+\frac{x^3}{3}+\frac{x^2}{e^x+1}-x^2-x^2\log\left(e^x+1\right)+2x\log\left(e^x+1\right)$$

Antiderivative was successfully verified.

```
[In] Int[x^2/(1 + 2*E^x + E^(2*x)),x]
```

```
[Out] -x^2 + x^2/(1 + E^x) + x^3/3 + 2*x*Log[1 + E^x] - x^2*Log[1 + E^x] + 2*Poly
Log[2, -E^x] - 2*x*PolyLog[2, -E^x] + 2*PolyLog[3, -E^x]
```

Rule 2184

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[((c + d*x)^m*(F^(g*(e + f*x)))^n)/(a + b*(F^(g*(e + f*x)))^n), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2185

```
Int[((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.))^(p_)*((c_.) +
(d_.)*(x_))^(m_.), x_Symbol] :> Dist[1/a, Int[(c + d*x)^m*(a + b*(F^(g*(e +
 f*x)))^n)^(p + 1), x], x] - Dist[b/a, Int[(c + d*x)^m*(F^(g*(e + f*x)))^n*
(a + b*(F^(g*(e + f*x)))^n)^p, x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n},
 x] && ILtQ[p, 0] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
```

```
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2191

```
Int[((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((a_.) + (b_.)*((F_)^((g_.)*(
(e_.) + (f_.)*(x_))))^(n_.))^(p_.)*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :>
 Simp[((c + d*x)^m*(a + b*(F^(g*(e + f*x)))^n)^(p + 1))/(b*f*g*n*(p + 1)*Lo
g[F]), x] - Dist[(d*m)/(b*f*g*n*(p + 1)*Log[F]), Int[(c + d*x)^(m - 1)*(a +
 b*(F^(g*(e + f*x)))^n)^(p + 1), x], x] /; FreeQ[{F, a, b, c, d, e, f, g, m
, n, p}, x] && NeQ[p, -1]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rubi steps

$$\begin{aligned}
\int \frac{x^2}{1+2e^x+e^{2x}}\,dx &= \int \frac{x^2}{(1+e^x)^2}\,dx\\
&= -\int \frac{e^x x^2}{(1+e^x)^2}\,dx + \int \frac{x^2}{1+e^x}\,dx\\
&= \frac{x^2}{1+e^x} + \frac{x^3}{3} - 2\int \frac{x}{1+e^x}\,dx - \int \frac{e^x x^2}{1+e^x}\,dx\\
&= -x^2 + \frac{x^2}{1+e^x} + \frac{x^3}{3} - x^2\log(1+e^x) + 2\int \frac{e^x x}{1+e^x}\,dx + 2\int x\log(1+e^x)\,dx\\
&= -x^2 + \frac{x^2}{1+e^x} + \frac{x^3}{3} + 2x\log(1+e^x) - x^2\log(1+e^x) - 2x\mathrm{Li}_2(-e^x) - 2\int \log(1+e^x)\,dx \cdot\\
&= -x^2 + \frac{x^2}{1+e^x} + \frac{x^3}{3} + 2x\log(1+e^x) - x^2\log(1+e^x) - 2x\mathrm{Li}_2(-e^x) - 2\,\mathrm{Subst}\left(\int \frac{\log(1+}{x}\right.\\
&= -x^2 + \frac{x^2}{1+e^x} + \frac{x^3}{3} + 2x\log(1+e^x) - x^2\log(1+e^x) + 2\mathrm{Li}_2(-e^x) - 2x\mathrm{Li}_2(-e^x) + 2\mathrm{Li}_3(-
\end{aligned}$$

Mathematica [A] time = 0.10, size = 57, normalized size = 0.79

$$-2(x-1)\mathrm{Li}_2(-e^x) + 2\mathrm{Li}_3(-e^x) + \frac{(e^x(x-3)+x)\,x^2}{3(e^x+1)} - (x-2)x\log(e^x+1)$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/(1 + 2*E^x + E^(2*x)),x]
```

```
[Out] (x^2*(E^x*(-3 + x) + x))/(3*(1 + E^x)) - (-2 + x)*x*Log[1 + E^x] - 2*(-1 +
x)*PolyLog[2, -E^x] + 2*PolyLog[3, -E^x]
```

fricas [C] time = 0.41, size = 76, normalized size = 1.06

$$\frac{x^3 - 6((x-1)e^x + x - 1)\mathrm{Li}_2(-e^x) + \left(x^3 - 3x^2\right)e^x - 3\left(x^2 + \left(x^2 - 2x\right)e^x - 2x\right)\log(e^x+1) + 6(e^x+1)\mathrm{polylog}(}{3(e^x+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(1+2*exp(x)+exp(2*x)),x, algorithm="fricas")
```

```
[Out] 1/3*(x^3 - 6*((x - 1)*e^x + x - 1)*dilog(-e^x) + (x^3 - 3*x^2)*e^x - 3*(x^2
 + (x^2 - 2*x)*e^x - 2*x)*log(e^x + 1) + 6*(e^x + 1)*polylog(3, -e^x))/(e^x
 + 1)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{e^{(2x)} + 2e^x + 1} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(1+2*exp(x)+exp(2*x)),x, algorithm="giac")
```

```
[Out] integrate(x^2/(e^(2*x) + 2*e^x + 1), x)
```

maple [A] time = 0.04, size = 65, normalized size = 0.90

$$\frac{x^3}{3} - x^2 \ln\left(e^x + 1\right) - x^2 + \frac{x^2}{e^x + 1} - 2x \,\mathrm{polylog}\left(2, -e^x\right) + 2x \ln\left(e^x + 1\right) + 2\,\mathrm{polylog}\left(2, -e^x\right) + 2\,\mathrm{polylog}\left(3, -e^x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(1+2*exp(x)+exp(2*x)),x)
```

```
[Out] -x^2+x^2/(exp(x)+1)+1/3*x^3+2*x*ln(exp(x)+1)-x^2*ln(exp(x)+1)+2*polylog(2,-
exp(x))-2*x*polylog(2,-exp(x))+2*polylog(3,-exp(x))
```

maxima [A] time = 0.91, size = 62, normalized size = 0.86

$$\frac{1}{3}x^3 - x^2 \log\left(e^x + 1\right) - x^2 - 2x\mathrm{Li}_2\left(-e^x\right) + 2x \log\left(e^x + 1\right) + \frac{x^2}{e^x + 1} + 2\,\mathrm{Li}_2\left(-e^x\right) + 2\,\mathrm{Li}_3(-e^x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(1+2*exp(x)+exp(2*x)),x, algorithm="maxima")
```

```
[Out] 1/3*x^3 - x^2*log(e^x + 1) - x^2 - 2*x*dilog(-e^x) + 2*x*log(e^x + 1) + x^2
/(e^x + 1) + 2*dilog(-e^x) + 2*polylog(3, -e^x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2}{e^{2x} + 2e^x + 1} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(exp(2*x) + 2*exp(x) + 1),x)
```

```
[Out] int(x^2/(exp(2*x) + 2*exp(x) + 1), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{x^2}{e^x + 1} + \int \frac{x(x-2)}{e^x + 1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(1+2*exp(x)+exp(2*x)),x)
[Out] x**2/(exp(x) + 1) + Integral(x*(x - 2)/(exp(x) + 1), x)
```

3.516 $\int \frac{x^2}{2+3e^x+e^{2x}}\,dx$

Optimal. Leaf size=77

$$-2x\mathrm{Li}_2\left(-e^x\right)+x\mathrm{Li}_2\left(-\frac{e^x}{2}\right)+2\mathrm{Li}_3\left(-e^x\right)-\mathrm{Li}_3\left(-\frac{e^x}{2}\right)+\frac{x^3}{6}+\frac{1}{2}x^2\log\left(\frac{e^x}{2}+1\right)-x^2\log\left(e^x+1\right)$$

```
[Out] 1/6*x^3+1/2*x^2*ln(1+1/2*exp(x))-x^2*ln(1+exp(x))-2*x*polylog(2,-exp(x))+x*
polylog(2,-1/2*exp(x))+2*polylog(3,-exp(x))-polylog(3,-1/2*exp(x))
```

Rubi [A] time = 0.22, antiderivative size = 77, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 6, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {2263, 2184, 2190, 2531, 2282, 6589}

$$-2x\mathrm{PolyLog}\left(2,-e^x\right)+x\mathrm{PolyLog}\left(2,-\frac{e^x}{2}\right)+2\mathrm{PolyLog}\left(3,-e^x\right)-\mathrm{PolyLog}\left(3,-\frac{e^x}{2}\right)+\frac{x^3}{6}+\frac{1}{2}x^2\log\left(\frac{e^x}{2}+1\right)-x^2\log($$

Antiderivative was successfully verified.

```
[In] Int[x^2/(2 + 3*E^x + E^(2*x)),x]
```

```
[Out] x^3/6 + (x^2*Log[1 + E^x/2])/2 - x^2*Log[1 + E^x] - 2*x*PolyLog[2, -E^x] +
x*PolyLog[2, -E^x/2] + 2*PolyLog[3, -E^x] - PolyLog[3, -E^x/2]
```

Rule 2184

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[((c + d*x)^m*(F^(g*(e + f*x)))^n)/(a + b*(F^(g*(e + f*x)))^n), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2263

```
Int[((f_.) + (g_.)*(x_))^(m_.)/((a_.) + (b_.)*(F_)^(u_) + (c_.)*(F_)^(v_)),
 x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[(2*c)/q, Int[(f + g*x)^m/
(b - q + 2*c*F^u), x], x] - Dist[(2*c)/q, Int[(f + g*x)^m/(b + q + 2*c*F^u)
, x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v, 2*u] && LinearQ[u, x] &
```

```
& NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\begin{aligned}
\int \frac{x^2}{2+3e^x+e^{2x}}\,dx &= 2\int \frac{x^2}{2+2e^x}\,dx - 2\int \frac{x^2}{4+2e^x}\,dx \\
&= \frac{x^3}{6} - 2\int \frac{e^x x^2}{2+2e^x}\,dx + \int \frac{e^x x^2}{4+2e^x}\,dx \\
&= \frac{x^3}{6} + \frac{1}{2}x^2\log\left(1+\frac{e^x}{2}\right) - x^2\log\left(1+e^x\right) + 2\int x\log\left(1+e^x\right)\,dx - \int x\log\left(1+\frac{e^x}{2}\right)\,dx \\
&= \frac{x^3}{6} + \frac{1}{2}x^2\log\left(1+\frac{e^x}{2}\right) - x^2\log\left(1+e^x\right) - 2x\text{Li}_2\left(-e^x\right) + x\text{Li}_2\left(-\frac{e^x}{2}\right) + 2\int \text{Li}_2\left(-e^x\right)\,dx - \\
&= \frac{x^3}{6} + \frac{1}{2}x^2\log\left(1+\frac{e^x}{2}\right) - x^2\log\left(1+e^x\right) - 2x\text{Li}_2\left(-e^x\right) + x\text{Li}_2\left(-\frac{e^x}{2}\right) + 2\,\text{Subst}\left(\int \frac{\text{Li}_2(-x}{x}\right. \\
&= \frac{x^3}{6} + \frac{1}{2}x^2\log\left(1+\frac{e^x}{2}\right) - x^2\log\left(1+e^x\right) - 2x\text{Li}_2\left(-e^x\right) + x\text{Li}_2\left(-\frac{e^x}{2}\right) + 2\text{Li}_3\left(-e^x\right) - \text{Li}_3\left(-\right.
\end{aligned}$$

Mathematica [A]   time = 0.01, size = 77, normalized size = 1.00

$$-x\text{Li}_2\left(-2e^{-x}\right)+2x\text{Li}_2\left(-e^{-x}\right)-\text{Li}_3\left(-2e^{-x}\right)+2\text{Li}_3\left(-e^{-x}\right)+x^2\left(-\log\left(e^{-x}+1\right)\right)+\frac{1}{2}x^2\log\left(2e^{-x}+1\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/(2 + 3*E^x + E^(2*x)),x]
```

```
[Out] -(x^2*Log[1 + E^(-x)]) + (x^2*Log[1 + 2/E^x])/2 - x*PolyLog[2, -2/E^x] + 2*
x*PolyLog[2, -E^(-x)] - PolyLog[3, -2/E^x] + 2*PolyLog[3, -E^(-x)]
```

fricas [C]   time = 0.42, size = 59, normalized size = 0.77

$$\frac{1}{6}\,x^3-x^2\log\left(e^x+1\right)+\frac{1}{2}\,x^2\log\left(\frac{1}{2}\,e^x+1\right)+x\text{Li}_2\left(-\frac{1}{2}\,e^x\right)-2\,x\text{Li}_2\left(-e^x\right)-\text{polylog}\left(3,-\frac{1}{2}\,e^x\right)+2\,\text{polylog}\left(3,-e^x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(2+3*exp(x)+exp(2*x)),x, algorithm="fricas")
```

```
[Out] 1/6*x^3 - x^2*log(e^x + 1) + 1/2*x^2*log(1/2*e^x + 1) + x*dilog(-1/2*e^x) -
 2*x*dilog(-e^x) - polylog(3, -1/2*e^x) + 2*polylog(3, -e^x)
```

giac [F]   time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{e^{(2\,x)}+3\,e^x+2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(2+3*exp(x)+exp(2*x)),x, algorithm="giac")
```

```
[Out] integrate(x^2/(e^(2*x) + 3*e^x + 2), x)
```

maple [A]   time = 0.02, size = 62, normalized size = 0.81

$$\frac{x^3}{6}-x^2\ln\left(\mathrm{e}^x+1\right)+\frac{x^2\ln\left(\frac{\mathrm{e}^x}{2}+1\right)}{2}-2x\,\text{polylog}\left(2,-\mathrm{e}^x\right)+x\,\text{polylog}\left(2,-\frac{\mathrm{e}^x}{2}\right)+2\,\text{polylog}\left(3,-\mathrm{e}^x\right)-\text{polylog}\left(3,-\frac{\mathrm{e}^x}{2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(2+3*exp(x)+exp(2*x)),x)
```

```
[Out] 1/6*x^3+1/2*x^2*ln(1/2*exp(x)+1)-x^2*ln(exp(x)+1)-2*x*polylog(2,-exp(x))+x*
polylog(2,-1/2*exp(x))+2*polylog(3,-exp(x))-polylog(3,-1/2*exp(x))
```

maxima [A] time = 0.93, size = 59, normalized size = 0.77

$$\frac{1}{6}x^3 - x^2\log\left(e^x+1\right) + \frac{1}{2}x^2\log\left(\frac{1}{2}e^x+1\right) + x\mathrm{Li}_2\left(-\frac{1}{2}e^x\right) - 2x\mathrm{Li}_2\left(-e^x\right) - \mathrm{Li}_3(-\frac{1}{2}e^x) + 2\,\mathrm{Li}_3(-e^x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(2+3*exp(x)+exp(2*x)),x, algorithm="maxima")
```

```
[Out] 1/6*x^3 - x^2*log(e^x + 1) + 1/2*x^2*log(1/2*e^x + 1) + x*dilog(-1/2*e^x) -
 2*x*dilog(-e^x) - polylog(3, -1/2*e^x) + 2*polylog(3, -e^x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2}{e^{2x}+3e^x+2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(exp(2*x) + 3*exp(x) + 2),x)
```

```
[Out] int(x^2/(exp(2*x) + 3*exp(x) + 2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\left(e^x+1\right)\left(e^x+2\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(2+3*exp(x)+exp(2*x)),x)
```

```
[Out] Integral(x**2/((exp(x) + 1)*(exp(x) + 2)), x)
```

3.517 $\int \frac{x^2}{-1+e^x+e^{2x}}\,dx$

Optimal. Leaf size=259

$$-\frac{4x\text{Li}_2\left(-\frac{2e^x}{1-\sqrt{5}}\right)}{\sqrt{5}\left(1-\sqrt{5}\right)}+\frac{4x\text{Li}_2\left(-\frac{2e^x}{1+\sqrt{5}}\right)}{\sqrt{5}\left(1+\sqrt{5}\right)}+\frac{4\text{Li}_3\left(-\frac{2e^x}{1-\sqrt{5}}\right)}{\sqrt{5}\left(1-\sqrt{5}\right)}-\frac{4\text{Li}_3\left(-\frac{2e^x}{1+\sqrt{5}}\right)}{\sqrt{5}\left(1+\sqrt{5}\right)}-\frac{2x^3}{3\sqrt{5}\left(1+\sqrt{5}\right)}+\frac{2x^3}{3\sqrt{5}\left(1-\sqrt{5}\right)}-\frac{2x^2\log\left(\frac{2e^x}{1-\ldots}\right.}{\sqrt{5}\left(1-\ldots\right.}$$

```
[Out] 2/15*x^3/(-5^(1/2)+1)*5^(1/2)-2/5*x^2*ln(1+2*exp(x)/(-5^(1/2)+1))/(-5^(1/2)
+1)*5^(1/2)-4/5*x*polylog(2,-2*exp(x)/(-5^(1/2)+1))/(-5^(1/2)+1)*5^(1/2)+4/
5*polylog(3,-2*exp(x)/(-5^(1/2)+1))/(-5^(1/2)+1)*5^(1/2)-2/15*x^3*5^(1/2)/(
5^(1/2)+1)+2/5*x^2*ln(1+2*exp(x)/(5^(1/2)+1))*5^(1/2)/(5^(1/2)+1)+4/5*x*pol
ylog(2,-2*exp(x)/(5^(1/2)+1))*5^(1/2)/(5^(1/2)+1)-4/5*polylog(3,-2*exp(x)/(
5^(1/2)+1))*5^(1/2)/(5^(1/2)+1)
```

Rubi [A] time = 0.30, antiderivative size = 259, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 6, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375, Rules used = {2263, 2184, 2190, 2531, 2282, 6589}

$$-\frac{4x\text{PolyLog}\left(2,-\frac{2e^x}{1-\sqrt{5}}\right)}{\sqrt{5}\left(1-\sqrt{5}\right)}+\frac{4x\text{PolyLog}\left(2,-\frac{2e^x}{1+\sqrt{5}}\right)}{\sqrt{5}\left(1+\sqrt{5}\right)}+\frac{4\text{PolyLog}\left(3,-\frac{2e^x}{1-\sqrt{5}}\right)}{\sqrt{5}\left(1-\sqrt{5}\right)}-\frac{4\text{PolyLog}\left(3,-\frac{2e^x}{1+\sqrt{5}}\right)}{\sqrt{5}\left(1+\sqrt{5}\right)}-\frac{2x^3}{3\sqrt{5}\left(1+\sqrt{\ldots}\right.}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/(-1 + E^x + E^(2*x)),x]
```

```
[Out] (2*x^3)/(3*Sqrt[5]*(1 - Sqrt[5])) - (2*x^3)/(3*Sqrt[5]*(1 + Sqrt[5])) - (2*
x^2*Log[1 + (2*E^x)/(1 - Sqrt[5])])/(Sqrt[5]*(1 - Sqrt[5])) + (2*x^2*Log[1
+ (2*E^x)/(1 + Sqrt[5])])/(Sqrt[5]*(1 + Sqrt[5])) - (4*x*PolyLog[2, (-2*E^x
)/(1 - Sqrt[5])])/(Sqrt[5]*(1 - Sqrt[5])) + (4*x*PolyLog[2, (-2*E^x)/(1 + S
qrt[5])])/(Sqrt[5]*(1 + Sqrt[5])) + (4*PolyLog[3, (-2*E^x)/(1 - Sqrt[5])])/
(Sqrt[5]*(1 - Sqrt[5])) - (4*PolyLog[3, (-2*E^x)/(1 + Sqrt[5])])/(Sqrt[5]*(
1 + Sqrt[5]))
```

Rule 2184

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[((c + d*x)^m*(F^(g*(e + f*x)))^n)/(a + b*(F^(g*(e + f*x)))^n), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
```

```
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2263

```
Int[((f_.) + (g_.)*(x_))^(m_.)/((a_.) + (b_.)*(F_)^(u_) + (c_.)*(F_)^(v_)),
 x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[(2*c)/q, Int[(f + g*x)^m/
(b - q + 2*c*F^u), x], x] - Dist[(2*c)/q, Int[(f + g*x)^m/(b + q + 2*c*F^u)
, x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v, 2*u] && LinearQ[u, x] &
& NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x^2}{-1+e^x+e^{2x}}\,dx = \frac{2\int \frac{x^2}{1-\sqrt{5}+2e^x}\,dx}{\sqrt{5}} - \frac{2\int \frac{x^2}{1+\sqrt{5}+2e^x}\,dx}{\sqrt{5}}$$

$$= \frac{2x^3}{3\sqrt{5}\left(1-\sqrt{5}\right)} - \frac{2x^3}{3\sqrt{5}\left(1+\sqrt{5}\right)} - \frac{4\int \frac{e^x x^2}{1-\sqrt{5}+2e^x}\,dx}{\sqrt{5}\left(1-\sqrt{5}\right)} + \frac{4\int \frac{e^x x^2}{1+\sqrt{5}+2e^x}\,dx}{\sqrt{5}\left(1+\sqrt{5}\right)}$$

$$= \frac{2x^3}{3\sqrt{5}\left(1-\sqrt{5}\right)} - \frac{2x^3}{3\sqrt{5}\left(1+\sqrt{5}\right)} - \frac{2x^2\log\left(1+\frac{2e^x}{1-\sqrt{5}}\right)}{\sqrt{5}\left(1-\sqrt{5}\right)} + \frac{2x^2\log\left(1+\frac{2e^x}{1+\sqrt{5}}\right)}{\sqrt{5}\left(1+\sqrt{5}\right)} + \frac{4\int x\log\left(\right.}{\sqrt{5}\left(\right.}$$

$$= \frac{2x^3}{3\sqrt{5}\left(1-\sqrt{5}\right)} - \frac{2x^3}{3\sqrt{5}\left(1+\sqrt{5}\right)} - \frac{2x^2\log\left(1+\frac{2e^x}{1-\sqrt{5}}\right)}{\sqrt{5}\left(1-\sqrt{5}\right)} + \frac{2x^2\log\left(1+\frac{2e^x}{1+\sqrt{5}}\right)}{\sqrt{5}\left(1+\sqrt{5}\right)} - \frac{4x\mathrm{Li}_2\left(-\right.}{\sqrt{5}\left(1-\right.}$$

$$= \frac{2x^3}{3\sqrt{5}\left(1-\sqrt{5}\right)} - \frac{2x^3}{3\sqrt{5}\left(1+\sqrt{5}\right)} - \frac{2x^2\log\left(1+\frac{2e^x}{1-\sqrt{5}}\right)}{\sqrt{5}\left(1-\sqrt{5}\right)} + \frac{2x^2\log\left(1+\frac{2e^x}{1+\sqrt{5}}\right)}{\sqrt{5}\left(1+\sqrt{5}\right)} - \frac{4x\mathrm{Li}_2\left(-\right.}{\sqrt{5}\left(1-\right.}$$

$$= \frac{2x^3}{3\sqrt{5}\left(1-\sqrt{5}\right)} - \frac{2x^3}{3\sqrt{5}\left(1+\sqrt{5}\right)} - \frac{2x^2\log\left(1+\frac{2e^x}{1-\sqrt{5}}\right)}{\sqrt{5}\left(1-\sqrt{5}\right)} + \frac{2x^2\log\left(1+\frac{2e^x}{1+\sqrt{5}}\right)}{\sqrt{5}\left(1+\sqrt{5}\right)} - \frac{4x\mathrm{Li}_2\left(-\right.}{\sqrt{5}\left(1-\right.}$$

Mathematica [A] time = 0.15, size = 172, normalized size = 0.66

$$\frac{2\left(-\frac{2\left(x\mathrm{Li}_2\left(\frac{1}{2}\left(-1+\sqrt{5}\right)e^{-x}\right)+\mathrm{Li}_3\left(\frac{1}{2}\left(-1+\sqrt{5}\right)e^{-x}\right)\right)}{\sqrt{5}-1} - \frac{2\left(x\mathrm{Li}_2\left(-\frac{1}{2}\left(1+\sqrt{5}\right)e^{-x}\right)+\mathrm{Li}_3\left(-\frac{1}{2}\left(1+\sqrt{5}\right)e^{-x}\right)\right)}{1+\sqrt{5}} + \frac{x^2\log\left(1-\frac{1}{2}\left(\sqrt{5}-1\right)e^{-x}\right)}{\sqrt{5}-1} + \frac{x^2\log\left(\frac{1}{2}\left(1+\sqrt{\right.\right.}{1+\sqrt{5}}\right.}{\sqrt{5}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/(-1 + E^x + E^(2*x)),x]
```

```
[Out] (2*((x^2*Log[1 - (-1 + Sqrt[5])/(2*E^x)])/(-1 + Sqrt[5]) + (x^2*Log[1 + (1
+ Sqrt[5])/(2*E^x)])/(1 + Sqrt[5]) - (2*(x*PolyLog[2, (-1 + Sqrt[5])/(2*E^x
)] + PolyLog[3, (-1 + Sqrt[5])/(2*E^x)]))/(-1 + Sqrt[5]) - (2*(x*PolyLog[2,
 -1/2*(1 + Sqrt[5])/E^x] + PolyLog[3, -1/2*(1 + Sqrt[5])/E^x]))/(1 + Sqrt[5
])))/Sqrt[5]
```

fricas [C] time = 0.42, size = 138, normalized size = 0.53

$$-\frac{1}{3}x^3+\frac{1}{5}\left(\sqrt{5}x+5x\right)\mathrm{Li}_2\left(\frac{1}{2}\left(\sqrt{5}+1\right)e^x\right)-\frac{1}{5}\left(\sqrt{5}x-5x\right)\mathrm{Li}_2\left(-\frac{1}{2}\left(\sqrt{5}-1\right)e^x\right)+\frac{1}{10}\left(\sqrt{5}x^2+5x^2\right)\log\left(-\frac{1}{2}\left(\sqrt{5}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(-1+exp(x)+exp(2*x)),x, algorithm="fricas")
```

```
[Out] -1/3*x^3 + 1/5*(sqrt(5)*x + 5*x)*dilog(1/2*(sqrt(5) + 1)*e^x) - 1/5*(sqrt(5
)*x - 5*x)*dilog(-1/2*(sqrt(5) - 1)*e^x) + 1/10*(sqrt(5)*x^2 + 5*x^2)*log(-
1/2*(sqrt(5) + 1)*e^x + 1) - 1/10*(sqrt(5)*x^2 - 5*x^2)*log(1/2*(sqrt(5) -
1)*e^x + 1) - 1/5*(sqrt(5) + 5)*polylog(3, 1/2*(sqrt(5) + 1)*e^x) + 1/5*(sq
rt(5) - 5)*polylog(3, -1/2*(sqrt(5) - 1)*e^x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{e^{(2x)} + e^x - 1}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(-1+exp(x)+exp(2*x)),x, algorithm="giac")
```

```
[Out] integrate(x^2/(e^(2*x) + e^x - 1), x)
```

maple [F] time = 0.04, size = 0, normalized size = 0.00

$$\int \frac{x^2}{e^x + e^{2x} - 1}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(exp(x)+exp(2*x)-1),x)
```

```
[Out] int(x^2/(exp(x)+exp(2*x)-1),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{e^{(2x)} + e^x - 1}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(-1+exp(x)+exp(2*x)),x, algorithm="maxima")
```

```
[Out] integrate(x^2/(e^(2*x) + e^x - 1), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2}{e^{2x} + e^x - 1}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(exp(2*x) + exp(x) - 1),x)
```

```
[Out] int(x^2/(exp(2*x) + exp(x) - 1), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{e^{2x} + e^x - 1}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(-1+exp(x)+exp(2*x)),x)
```

```
[Out] Integral(x**2/(exp(2*x) + exp(x) - 1), x)
```

3.518 $\int \frac{x^2}{3+3e^x+e^{2x}}\,dx$

Optimal. Leaf size=293

$$-\frac{4x\text{Li}_2\left(-\frac{2e^x}{3-i\sqrt{3}}\right)}{\sqrt{3}\left(\sqrt{3}+3i\right)}+\frac{4x\text{Li}_2\left(-\frac{2e^x}{3+i\sqrt{3}}\right)}{\sqrt{3}\left(-\sqrt{3}+3i\right)}+\frac{4\text{Li}_3\left(-\frac{2e^x}{3-i\sqrt{3}}\right)}{\sqrt{3}\left(\sqrt{3}+3i\right)}-\frac{4\text{Li}_3\left(-\frac{2e^x}{3+i\sqrt{3}}\right)}{\sqrt{3}\left(-\sqrt{3}+3i\right)}+\frac{2x^3}{3\sqrt{3}\left(\sqrt{3}+3i\right)}-\frac{2x^3}{3\sqrt{3}\left(-\sqrt{3}+3i\right)}-\frac{2x^2}{\ldots}$$

```
[Out] -2/9*x^3/(3*I-3^(1/2))*3^(1/2)+2/3*x^2*ln(1+2*exp(x)/(3+I*3^(1/2)))/(3*I-3^
(1/2))*3^(1/2)+4/3*x*polylog(2,-2*exp(x)/(3+I*3^(1/2)))/(3*I-3^(1/2))*3^(1/
2)-4/3*polylog(3,-2*exp(x)/(3+I*3^(1/2)))/(3*I-3^(1/2))*3^(1/2)+2/9*x^3*3^(
1/2)/(3*I+3^(1/2))-2/3*x^2*ln(1+2*exp(x)/(3-I*3^(1/2)))*3^(1/2)/(3*I+3^(1/2
))-4/3*x*polylog(2,-2*exp(x)/(3-I*3^(1/2)))*3^(1/2)/(3*I+3^(1/2))+4/3*polyl
og(3,-2*exp(x)/(3-I*3^(1/2)))*3^(1/2)/(3*I+3^(1/2))
```

Rubi [A] time = 0.31, antiderivative size = 293, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 6, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {2263, 2184, 2190, 2531, 2282, 6589}

$$-\frac{4x\text{PolyLog}\left(2,-\frac{2e^x}{3-i\sqrt{3}}\right)}{\sqrt{3}\left(\sqrt{3}+3i\right)}+\frac{4x\text{PolyLog}\left(2,-\frac{2e^x}{3+i\sqrt{3}}\right)}{\sqrt{3}\left(-\sqrt{3}+3i\right)}+\frac{4\text{PolyLog}\left(3,-\frac{2e^x}{3-i\sqrt{3}}\right)}{\sqrt{3}\left(\sqrt{3}+3i\right)}-\frac{4\text{PolyLog}\left(3,-\frac{2e^x}{3+i\sqrt{3}}\right)}{\sqrt{3}\left(-\sqrt{3}+3i\right)}+\frac{2x^3}{3\sqrt{3}\left(\sqrt{3}\ldots\right.}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/(3 + 3*E^x + E^(2*x)),x]
```

```
[Out] (-2*x^3)/(3*Sqrt[3]*(3*I - Sqrt[3])) + (2*x^3)/(3*Sqrt[3]*(3*I + Sqrt[3]))
- (2*x^2*Log[1 + (2*E^x)/(3 - I*Sqrt[3])])/(Sqrt[3]*(3*I + Sqrt[3])) + (2*x
^2*Log[1 + (2*E^x)/(3 + I*Sqrt[3])])/(Sqrt[3]*(3*I - Sqrt[3])) - (4*x*PolyL
og[2, (-2*E^x)/(3 - I*Sqrt[3])])/(Sqrt[3]*(3*I + Sqrt[3])) + (4*x*PolyLog[2
, (-2*E^x)/(3 + I*Sqrt[3])])/(Sqrt[3]*(3*I - Sqrt[3])) + (4*PolyLog[3, (-2*
E^x)/(3 - I*Sqrt[3])])/(Sqrt[3]*(3*I + Sqrt[3])) - (4*PolyLog[3, (-2*E^x)/(
3 + I*Sqrt[3])])/(Sqrt[3]*(3*I - Sqrt[3]))
```

Rule 2184

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[((c + d*x)^m*(F^(g*(e + f*x)))^n)/(a + b*(F^(g*(e + f*x)))^n), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
```

```
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2263

```
Int[((f_.) + (g_.)*(x_))^(m_.)/((a_.) + (b_.)*(F_)^(u_) + (c_.)*(F_)^(v_)),
 x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[(2*c)/q, Int[(f + g*x)^m/
(b - q + 2*c*F^u), x], x] - Dist[(2*c)/q, Int[(f + g*x)^m/(b + q + 2*c*F^u)
, x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v, 2*u] && LinearQ[u, x] &
& NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x^2}{3+3e^x+e^{2x}}\,dx = -\frac{(2i)\int \frac{x^2}{3-i\sqrt{3}+2e^x}\,dx}{\sqrt{3}} + \frac{(2i)\int \frac{x^2}{3+i\sqrt{3}+2e^x}\,dx}{\sqrt{3}}$$

$$= -\frac{2x^3}{3\sqrt{3}\left(3i-\sqrt{3}\right)} + \frac{2x^3}{3\sqrt{3}\left(3i+\sqrt{3}\right)} + \frac{(4i)\int \frac{e^x x^2}{3-i\sqrt{3}+2e^x}\,dx}{\sqrt{3}\left(3-i\sqrt{3}\right)} - \frac{(4i)\int \frac{e^x x^2}{3+i\sqrt{3}+2e^x}\,dx}{\sqrt{3}\left(3+i\sqrt{3}\right)}$$

$$= -\frac{2x^3}{3\sqrt{3}\left(3i-\sqrt{3}\right)} + \frac{2x^3}{3\sqrt{3}\left(3i+\sqrt{3}\right)} - \frac{2x^2\log\left(1+\frac{2e^x}{3-i\sqrt{3}}\right)}{\sqrt{3}\left(3i+\sqrt{3}\right)} + \frac{2x^2\log\left(1+\frac{2e^x}{3+i\sqrt{3}}\right)}{\sqrt{3}\left(3i-\sqrt{3}\right)} - \frac{(4i)}{}$$

$$= -\frac{2x^3}{3\sqrt{3}\left(3i-\sqrt{3}\right)} + \frac{2x^3}{3\sqrt{3}\left(3i+\sqrt{3}\right)} - \frac{2x^2\log\left(1+\frac{2e^x}{3-i\sqrt{3}}\right)}{\sqrt{3}\left(3i+\sqrt{3}\right)} + \frac{2x^2\log\left(1+\frac{2e^x}{3+i\sqrt{3}}\right)}{\sqrt{3}\left(3i-\sqrt{3}\right)} - \frac{4x\mathrm{Li}}{\sqrt{3}}$$

$$= -\frac{2x^3}{3\sqrt{3}\left(3i-\sqrt{3}\right)} + \frac{2x^3}{3\sqrt{3}\left(3i+\sqrt{3}\right)} - \frac{2x^2\log\left(1+\frac{2e^x}{3-i\sqrt{3}}\right)}{\sqrt{3}\left(3i+\sqrt{3}\right)} + \frac{2x^2\log\left(1+\frac{2e^x}{3+i\sqrt{3}}\right)}{\sqrt{3}\left(3i-\sqrt{3}\right)} - \frac{4x\mathrm{Li}}{\sqrt{3}}$$

$$= -\frac{2x^3}{3\sqrt{3}\left(3i-\sqrt{3}\right)} + \frac{2x^3}{3\sqrt{3}\left(3i+\sqrt{3}\right)} - \frac{2x^2\log\left(1+\frac{2e^x}{3-i\sqrt{3}}\right)}{\sqrt{3}\left(3i+\sqrt{3}\right)} + \frac{2x^2\log\left(1+\frac{2e^x}{3+i\sqrt{3}}\right)}{\sqrt{3}\left(3i-\sqrt{3}\right)} - \frac{4x\mathrm{Li}}{\sqrt{3}}$$

Mathematica [A] time = 0.19, size = 216, normalized size = 0.74

$$\frac{2i\left(\frac{2\left(x\mathrm{Li}_2\left(-\frac{1}{2}i\left(-3i+\sqrt{3}\right)e^{-x}\right)+\mathrm{Li}_3\left(-\frac{1}{2}i\left(-3i+\sqrt{3}\right)e^{-x}\right)\right)}{3+i\sqrt{3}} - \frac{2i\left(x\mathrm{Li}_2\left(\frac{1}{2}i\left(3i+\sqrt{3}\right)e^{-x}\right)+\mathrm{Li}_3\left(\frac{1}{2}i\left(3i+\sqrt{3}\right)e^{-x}\right)\right)}{\sqrt{3}+3i} + \frac{ix^2\log\left(1+\frac{1}{2}\left(3-i\sqrt{3}\right)e^{-x}\right)}{\sqrt{3}+3i} + \frac{ix^2\log}{}\right.}{\sqrt{3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/(3 + 3*E^x + E^(2*x)),x]
```

```
[Out] ((2*I)*((I*x^2*Log[1 + (3 - I*Sqrt[3])/(2*E^x)])/(3*I + Sqrt[3]) + (I*x^2*L
og[1 + (3 + I*Sqrt[3])/(2*E^x)])/(-3*I + Sqrt[3]) + (2*(x*PolyLog[2, ((-1/2
*I)*(-3*I + Sqrt[3]))/E^x] + PolyLog[3, ((-1/2*I)*(-3*I + Sqrt[3]))/E^x]))/
(3 + I*Sqrt[3]) - ((2*I)*(x*PolyLog[2, ((I/2)*(3*I + Sqrt[3]))/E^x] + PolyL
og[3, ((I/2)*(3*I + Sqrt[3]))/E^x]))/(3*I + Sqrt[3])))/Sqrt[3]
```

fricas [C] time = 0.45, size = 150, normalized size = 0.51

$$\frac{1}{9}x^3 - \frac{1}{3}\left(-i\sqrt{3}x+x\right)\mathrm{Li}_2\left(-\frac{1}{6}\left(i\sqrt{3}+3\right)e^x\right) - \frac{1}{3}\left(i\sqrt{3}x+x\right)\mathrm{Li}_2\left(-\frac{1}{6}\left(-i\sqrt{3}+3\right)e^x\right) - \frac{1}{6}\left(-i\sqrt{3}x^2+x^2\right)\log\left(\frac{1}{6}\left(i\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(3+3*exp(x)+exp(2*x)),x, algorithm="fricas")
```

```
[Out] 1/9*x^3 - 1/3*(-I*sqrt(3)*x + x)*dilog(-1/6*(I*sqrt(3) + 3)*e^x) - 1/3*(I*s
qrt(3)*x + x)*dilog(-1/6*(-I*sqrt(3) + 3)*e^x) - 1/6*(-I*sqrt(3)*x^2 + x^2)
*log(1/6*(I*sqrt(3) + 3)*e^x + 1) - 1/6*(I*sqrt(3)*x^2 + x^2)*log(1/6*(-I*s
qrt(3) + 3)*e^x + 1) - 1/3*(-I*sqrt(3) - 1)*polylog(3, 1/6*(I*sqrt(3) - 3)*
e^x) - 1/3*(I*sqrt(3) - 1)*polylog(3, 1/6*(-I*sqrt(3) - 3)*e^x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{e^{(2x)} + 3e^x + 3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(3+3*exp(x)+exp(2*x)),x, algorithm="giac")
```

```
[Out] integrate(x^2/(e^(2*x) + 3*e^x + 3), x)
```

maple [F] time = 0.04, size = 0, normalized size = 0.00

$$\int \frac{x^2}{3\,e^x + e^{2x} + 3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(3*exp(x)+exp(2*x)+3),x)
```

```
[Out] int(x^2/(3*exp(x)+exp(2*x)+3),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{e^{(2x)} + 3e^x + 3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(3+3*exp(x)+exp(2*x)),x, algorithm="maxima")
```

```
[Out] integrate(x^2/(e^(2*x) + 3*e^x + 3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2}{e^{2x} + 3\,e^x + 3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(exp(2*x) + 3*exp(x) + 3),x)
```

```
[Out] int(x^2/(exp(2*x) + 3*exp(x) + 3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{e^{2x} + 3e^x + 3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(3+3*exp(x)+exp(2*x)),x)
```

```
[Out] Integral(x**2/(exp(2*x) + 3*exp(x) + 3), x)
```

3.519 $\int \frac{x^2}{a+be^x+ce^{2x}}\,dx$

Optimal. Leaf size=391

$$\frac{4cx\text{Li}_2\left(-\frac{2ce^x}{b-\sqrt{b^2-4ac}}\right)}{-b\sqrt{b^2-4ac}-4ac+b^2}+\frac{4cx\text{Li}_2\left(-\frac{2ce^x}{b+\sqrt{b^2-4ac}}\right)}{b\sqrt{b^2-4ac}-4ac+b^2}-\frac{4c\text{Li}_3\left(-\frac{2ce^x}{b-\sqrt{b^2-4ac}}\right)}{-b\sqrt{b^2-4ac}-4ac+b^2}-\frac{4c\text{Li}_3\left(-\frac{2ce^x}{b+\sqrt{b^2-4ac}}\right)}{b\sqrt{b^2-4ac}-4ac+b^2}-\frac{}{3\left(-b\sqrt{b^2-\right.}}$$

```
[Out] -2/3*c*x^3/(b^2-4*a*c-b*(-4*a*c+b^2)^(1/2))+2*c*x^2*ln(1+2*c*exp(x)/(b-(-4*
a*c+b^2)^(1/2)))/(b^2-4*a*c-b*(-4*a*c+b^2)^(1/2))+4*c*x*polylog(2,-2*c*exp(
x)/(b-(-4*a*c+b^2)^(1/2)))/(b^2-4*a*c-b*(-4*a*c+b^2)^(1/2))-4*c*polylog(3,-
2*c*exp(x)/(b-(-4*a*c+b^2)^(1/2)))/(b^2-4*a*c-b*(-4*a*c+b^2)^(1/2))-2/3*c*x
^3/(b^2-4*a*c+b*(-4*a*c+b^2)^(1/2))+2*c*x^2*ln(1+2*c*exp(x)/(b+(-4*a*c+b^2)
^(1/2)))/(b^2-4*a*c+b*(-4*a*c+b^2)^(1/2))+4*c*x*polylog(2,-2*c*exp(x)/(b+(-
4*a*c+b^2)^(1/2)))/(b^2-4*a*c+b*(-4*a*c+b^2)^(1/2))-4*c*polylog(3,-2*c*exp(
x)/(b+(-4*a*c+b^2)^(1/2)))/(b^2-4*a*c+b*(-4*a*c+b^2)^(1/2))
```

Rubi [A] time = 0.67, antiderivative size = 391, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 6, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}} = 0.300$, Rules used = {2263, 2184, 2190, 2531, 2282, 6589}

$$\frac{4cx\text{PolyLog}\left(2,-\frac{2ce^x}{b-\sqrt{b^2-4ac}}\right)}{-b\sqrt{b^2-4ac}-4ac+b^2}+\frac{4cx\text{PolyLog}\left(2,-\frac{2ce^x}{\sqrt{b^2-4ac}+b}\right)}{b\sqrt{b^2-4ac}-4ac+b^2}-\frac{4c\text{PolyLog}\left(3,-\frac{2ce^x}{b-\sqrt{b^2-4ac}}\right)}{-b\sqrt{b^2-4ac}-4ac+b^2}-\frac{4c\text{PolyLog}\left(3,-\frac{2ce}{\sqrt{b^2-4}}\right.}{b\sqrt{b^2-4ac}-4ac+}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/(a + b*E^x + c*E^(2*x)),x]
```

```
[Out] (-2*c*x^3)/(3*(b^2 - 4*a*c - b*Sqrt[b^2 - 4*a*c])) - (2*c*x^3)/(3*(b^2 - 4*
a*c + b*Sqrt[b^2 - 4*a*c])) + (2*c*x^2*Log[1 + (2*c*E^x)/(b - Sqrt[b^2 - 4*
a*c])])/(b^2 - 4*a*c - b*Sqrt[b^2 - 4*a*c]) + (2*c*x^2*Log[1 + (2*c*E^x)/(b
 + Sqrt[b^2 - 4*a*c])])/(b^2 - 4*a*c + b*Sqrt[b^2 - 4*a*c]) + (4*c*x*PolyLo
g[2, (-2*c*E^x)/(b - Sqrt[b^2 - 4*a*c])])/(b^2 - 4*a*c - b*Sqrt[b^2 - 4*a*c
]) + (4*c*x*PolyLog[2, (-2*c*E^x)/(b + Sqrt[b^2 - 4*a*c])])/(b^2 - 4*a*c +
b*Sqrt[b^2 - 4*a*c]) - (4*c*PolyLog[3, (-2*c*E^x)/(b - Sqrt[b^2 - 4*a*c])])
/(b^2 - 4*a*c - b*Sqrt[b^2 - 4*a*c]) - (4*c*PolyLog[3, (-2*c*E^x)/(b + Sqrt
[b^2 - 4*a*c])])/(b^2 - 4*a*c + b*Sqrt[b^2 - 4*a*c])
```

Rule 2184

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[((c + d*x)^m*(F^(g*(e + f*x)))^n)/(a + b*(F^(g*(e + f*x)))^n), x],
```

```
x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2263

```
Int[((f_.) + (g_.)*(x_))^(m_.)/((a_.) + (b_.)*(F_)^(u_) + (c_.)*(F_)^(v_)),
 x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[(2*c)/q, Int[(f + g*x)^m/
(b - q + 2*c*F^u), x], x] - Dist[(2*c)/q, Int[(f + g*x)^m/(b + q + 2*c*F^u)
, x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v, 2*u] && LinearQ[u, x] &
& NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x^2}{a+be^x+ce^{2x}}\,dx = \frac{(2c)\int \frac{x^2}{b-\sqrt{b^2-4ac}+2ce^x}\,dx}{\sqrt{b^2-4ac}} - \frac{(2c)\int \frac{x^2}{b+\sqrt{b^2-4ac}+2ce^x}\,dx}{\sqrt{b^2-4ac}}$$

$$= -\frac{2cx^3}{3\left(b^2-4ac-b\sqrt{b^2-4ac}\right)} - \frac{2cx^3}{3\left(b^2-4ac+b\sqrt{b^2-4ac}\right)} + \frac{(4c^2)\int \frac{e^x x^2}{b-\sqrt{b^2-4ac}+2ce^x}\,dx}{b^2-4ac-b\sqrt{b^2-4ac}} + \cdots$$

$$= -\frac{2cx^3}{3\left(b^2-4ac-b\sqrt{b^2-4ac}\right)} - \frac{2cx^3}{3\left(b^2-4ac+b\sqrt{b^2-4ac}\right)} + \frac{2cx^2\log\left(1+\frac{2ce^x}{b-\sqrt{b^2-4ac}}\right)}{b^2-4ac-b\sqrt{b^2-4ac}} + \cdots$$

$$= -\frac{2cx^3}{3\left(b^2-4ac-b\sqrt{b^2-4ac}\right)} - \frac{2cx^3}{3\left(b^2-4ac+b\sqrt{b^2-4ac}\right)} + \frac{2cx^2\log\left(1+\frac{2ce^x}{b-\sqrt{b^2-4ac}}\right)}{b^2-4ac-b\sqrt{b^2-4ac}} + \cdots$$

$$= -\frac{2cx^3}{3\left(b^2-4ac-b\sqrt{b^2-4ac}\right)} - \frac{2cx^3}{3\left(b^2-4ac+b\sqrt{b^2-4ac}\right)} + \frac{2cx^2\log\left(1+\frac{2ce^x}{b-\sqrt{b^2-4ac}}\right)}{b^2-4ac-b\sqrt{b^2-4ac}} + \cdots$$

$$= -\frac{2cx^3}{3\left(b^2-4ac-b\sqrt{b^2-4ac}\right)} - \frac{2cx^3}{3\left(b^2-4ac+b\sqrt{b^2-4ac}\right)} + \frac{2cx^2\log\left(1+\frac{2ce^x}{b-\sqrt{b^2-4ac}}\right)}{b^2-4ac-b\sqrt{b^2-4ac}} + \cdots$$

Mathematica [A] time = 0.19, size = 407, normalized size = 1.04

$$\frac{-6x\left(\sqrt{b^2-4ac}+b\right)\text{Li}_2\left(\frac{2ce^x}{\sqrt{b^2-4ac}-b}\right)+6x\left(b-\sqrt{b^2-4ac}\right)\text{Li}_2\left(-\frac{2ce^x}{b+\sqrt{b^2-4ac}}\right)+6b\text{Li}_3\left(\frac{2ce^x}{\sqrt{b^2-4ac}-b}\right)+6\sqrt{b^2-4ac}\,\text{L}\cdots}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/(a + b*E^x + c*E^(2*x)),x]
```

```
[Out] (2*Sqrt[b^2 - 4*a*c]*x^3 - 3*b*x^2*Log[1 + (2*c*E^x)/(b - Sqrt[b^2 - 4*a*c]
)] - 3*Sqrt[b^2 - 4*a*c]*x^2*Log[1 + (2*c*E^x)/(b - Sqrt[b^2 - 4*a*c])] + 3
*b*x^2*Log[1 + (2*c*E^x)/(b + Sqrt[b^2 - 4*a*c])] - 3*Sqrt[b^2 - 4*a*c]*x^2
*Log[1 + (2*c*E^x)/(b + Sqrt[b^2 - 4*a*c])] - 6*(b + Sqrt[b^2 - 4*a*c])*x*P
olyLog[2, (2*c*E^x)/(-b + Sqrt[b^2 - 4*a*c])] + 6*(b - Sqrt[b^2 - 4*a*c])*x
*PolyLog[2, (-2*c*E^x)/(b + Sqrt[b^2 - 4*a*c])] + 6*b*PolyLog[3, (2*c*E^x)/
(-b + Sqrt[b^2 - 4*a*c])] + 6*Sqrt[b^2 - 4*a*c]*PolyLog[3, (2*c*E^x)/(-b +
Sqrt[b^2 - 4*a*c])] - 6*b*PolyLog[3, (-2*c*E^x)/(b + Sqrt[b^2 - 4*a*c])] +
```

```
6*Sqrt[b^2 - 4*a*c]*PolyLog[3, (-2*c*E^x)/(b + Sqrt[b^2 - 4*a*c])])/(6*a*Sq
rt[b^2 - 4*a*c])
```

fricas [C] time = 0.43, size = 415, normalized size = 1.06

$$\frac{2\left(b^{2}-4\,ac\right)x^{3}-6\left(abx\sqrt{\frac{b^{2}-4\,ac}{a^{2}}}+\left(b^{2}-4\,ac\right)x\right)\mathrm{Li}_{2}\left(-\frac{a\sqrt{\frac{b^{2}-4\,ac}{a^{2}}}\,e^{x}+be^{x}+2\,a}{2\,a}+1\right)+6\left(abx\sqrt{\frac{b^{2}-4\,ac}{a^{2}}}-\left(b^{2}-4\,ac\right)x\right)\mathrm{L}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a+b*exp(x)+c*exp(2*x)),x, algorithm="fricas")
```

```
[Out] 1/6*(2*(b^2 - 4*a*c)*x^3 - 6*(a*b*x*sqrt((b^2 - 4*a*c)/a^2) + (b^2 - 4*a*c)
*x)*dilog(-1/2*(a*sqrt((b^2 - 4*a*c)/a^2)*e^x + b*e^x + 2*a)/a + 1) + 6*(a*
b*x*sqrt((b^2 - 4*a*c)/a^2) - (b^2 - 4*a*c)*x)*dilog(1/2*(a*sqrt((b^2 - 4*a
*c)/a^2)*e^x - b*e^x - 2*a)/a + 1) - 3*(a*b*x^2*sqrt((b^2 - 4*a*c)/a^2) + (
b^2 - 4*a*c)*x^2)*log(1/2*(a*sqrt((b^2 - 4*a*c)/a^2)*e^x + b*e^x + 2*a)/a)
+ 3*(a*b*x^2*sqrt((b^2 - 4*a*c)/a^2) - (b^2 - 4*a*c)*x^2)*log(-1/2*(a*sqrt(
(b^2 - 4*a*c)/a^2)*e^x - b*e^x - 2*a)/a) + 6*(a*b*sqrt((b^2 - 4*a*c)/a^2) +
 b^2 - 4*a*c)*polylog(3, -1/2*(a*sqrt((b^2 - 4*a*c)/a^2)*e^x + b*e^x)/a) -
6*(a*b*sqrt((b^2 - 4*a*c)/a^2) - b^2 + 4*a*c)*polylog(3, 1/2*(a*sqrt((b^2 -
 4*a*c)/a^2)*e^x - b*e^x)/a))/(a*b^2 - 4*a^2*c)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{2}}{ce^{(2\,x)}+be^{x}+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a+b*exp(x)+c*exp(2*x)),x, algorithm="giac")
```

```
[Out] integrate(x^2/(c*e^(2*x) + b*e^x + a), x)
```

maple [F] time = 0.05, size = 0, normalized size = 0.00

$$\int \frac{x^{2}}{b\,\mathrm{e}^{x}+c\,\mathrm{e}^{2x}+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(b*exp(x)+c*exp(2*x)+a),x)
```

```
[Out] int(x^2/(b*exp(x)+c*exp(2*x)+a),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a+b*exp(x)+c*exp(2*x)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*a*c-b^2>0)', see `assume?` for mo
re details)Is 4*a*c-b^2 positive or negative?
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2}{a + b\,\mathrm{e}^x + c\,\mathrm{e}^{2\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(a + b*exp(x) + c*exp(2*x)),x)
```

```
[Out] int(x^2/(a + b*exp(x) + c*exp(2*x)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{a + be^x + ce^{2x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(a+b*exp(x)+c*exp(2*x)),x)
```

```
[Out] Integral(x**2/(a + b*exp(x) + c*exp(2*x)), x)
```

3.520 $\int \frac{1}{1+2f^{c+dx}+f^{2c+2dx}}\,dx$

Optimal. Leaf size=40

$$-\frac{\log\left(f^{c+dx}+1\right)}{d\log(f)}+\frac{1}{d\log(f)\left(f^{c+dx}+1\right)}+x$$

```
[Out] x+1/d/(1+f^(d*x+c))/ln(f)-ln(1+f^(d*x+c))/d/ln(f)
```

Rubi [A] time = 0.03, antiderivative size = 40, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087, Rules used = {2282, 44}

$$-\frac{\log\left(f^{c+dx}+1\right)}{d\log(f)}+\frac{1}{d\log(f)\left(f^{c+dx}+1\right)}+x$$

Antiderivative was successfully verified.

```
[In] Int[(1 + 2*f^(c + d*x) + f^(2*c + 2*d*x))^(-1),x]
```

```
[Out] x + 1/(d*(1 + f^(c + d*x))*Log[f]) - Log[1 + f^(c + d*x)]/(d*Log[f])
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\int \frac{1}{1+2f^{c+dx}+f^{2c+2dx}}\,dx = \frac{\text{Subst}\left(\int \frac{1}{x(1+x)^2}\,dx, x, f^{c+dx}\right)}{d\log(f)}$$
$$= \frac{\text{Subst}\left(\int \left(\frac{1}{-1-x}+\frac{1}{x}-\frac{1}{(1+x)^2}\right)dx, x, f^{c+dx}\right)}{d\log(f)}$$
$$= x+\frac{1}{d\left(1+f^{c+dx}\right)\log(f)}-\frac{\log\left(1+f^{c+dx}\right)}{d\log(f)}$$

Mathematica [A] time = 0.04, size = 37, normalized size = 0.92

$$\frac{\frac{1}{f^{c+dx}+1}-\log\left(f^{c+dx}+1\right)+dx\log(f)}{d\log(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(1 + 2*f^(c + d*x) + f^(2*c + 2*d*x))^(-1),x]
```

```
[Out] ((1 + f^(c + d*x))^(-1) + d*x*Log[f] - Log[1 + f^(c + d*x)])/(d*Log[f])
```

fricas [A] time = 0.43, size = 59, normalized size = 1.48

$$\frac{df^{dx+c}x\log(f)+dx\log(f)-\left(f^{dx+c}+1\right)\log\left(f^{dx+c}+1\right)+1}{df^{dx+c}\log(f)+d\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(1+2*f^(d*x+c)+f^(2*d*x+2*c)),x, algorithm="fricas")
```

```
[Out] (d*f^(d*x + c)*x*log(f) + d*x*log(f) - (f^(d*x + c) + 1)*log(f^(d*x + c) +
1) + 1)/(d*f^(d*x + c)*log(f) + d*log(f))
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(1+2*f^(d*x+c)+f^(2*d*x+2*c)),x, algorithm="giac")
```

```
[Out] Exception raised: NotImplementedError >> Unable to parse Giac output: Undef
/Unsigned Inf encountered in limitUndef/Unsigned Inf encountered in limitUn
```

```
def/Unsigned Inf encountered in limit1/d/ln(f)*ln(abs(f)^(d*x)*abs(f)^c)-1/
d/ln(f)*ln(abs(f^(d*x)*f^c+1))+1/ln(f)/d/(f^(d*x)*f^c+1)
```

maple [A] time = 0.03, size = 68, normalized size = 1.70

$$-\frac{\ln\left(\mathrm{e}^{(dx+c)\ln(f)}+1\right)}{d\ln(f)}+\frac{x\,\mathrm{e}^{(dx+c)\ln(f)}+x-\frac{\mathrm{e}^{(dx+c)\ln(f)}}{d\ln(f)}}{\mathrm{e}^{(dx+c)\ln(f)}+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(1+2*f^(d*x+c)+f^(2*d*x+2*c)),x)
```

```
[Out] (x+x*exp((d*x+c)*ln(f))-1/d/ln(f)*exp((d*x+c)*ln(f)))/(exp((d*x+c)*ln(f))+1
)-1/d/ln(f)*ln(exp((d*x+c)*ln(f))+1)
```

maxima [A] time = 0.97, size = 48, normalized size = 1.20

$$\frac{dx+c}{d}-\frac{\log\left(f^{dx+c}+1\right)}{d\log(f)}+\frac{1}{d\left(f^{dx+c}+1\right)\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(1+2*f^(d*x+c)+f^(2*d*x+2*c)),x, algorithm="maxima")
```

```
[Out] (d*x + c)/d - log(f^(d*x + c) + 1)/(d*log(f)) + 1/(d*(f^(d*x + c) + 1)*log(
f))
```

mupad [B] time = 3.52, size = 50, normalized size = 1.25

$$\frac{1}{d\,\ln(f)\,\left(f^{d\,x}\,f^c+1\right)}-\frac{\ln\left(f^{d\,x}\,f^c+1\right)-d\,x\,\ln(f)}{d\,\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(f^(2*c + 2*d*x) + 2*f^(c + d*x) + 1),x)
```

```
[Out] 1/(d*log(f)*(f^(d*x)*f^c + 1)) - (log(f^(d*x)*f^c + 1) - d*x*log(f))/(d*log
(f))
```

sympy [A] time = 0.13, size = 34, normalized size = 0.85

$$x+\frac{1}{df^{c+dx}\log\left(f\right)+d\log\left(f\right)}-\frac{\log\left(f^{c+dx}+1\right)}{d\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(1+2*f**(d*x+c)+f**(2*d*x+2*c)),x)
```

```
[Out] x + 1/(d*f**(c + d*x)*log(f) + d*log(f)) - log(f**(c + d*x) + 1)/(d*log(f))
```

3.521 $\int \frac{1}{a+bf^{c+dx}+cf^{2c+2dx}}\,dx$

Optimal. Leaf size=94

$$\frac{b\tanh^{-1}\left(\frac{b+2cf^{c+dx}}{\sqrt{b^2-4ac}}\right)}{ad\log(f)\sqrt{b^2-4ac}}-\frac{\log\left(a+bf^{c+dx}+cf^{2c+2dx}\right)}{2ad\log(f)}+\frac{x}{a}$$

```
[Out] x/a-1/2*ln(a+b*f^(d*x+c)+c*f^(2*d*x+2*c))/a/d/ln(f)+b*arctanh((b+2*c*f^(d*x
+c))/(-4*a*c+b^2)^(1/2))/a/d/ln(f)/(-4*a*c+b^2)^(1/2)
```

Rubi [A] time = 0.11, antiderivative size = 94, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.280, Rules used = {2282, 705, 29, 634, 618, 206, 628}

$$\frac{b\tanh^{-1}\left(\frac{b+2cf^{c+dx}}{\sqrt{b^2-4ac}}\right)}{ad\log(f)\sqrt{b^2-4ac}}-\frac{\log\left(a+bf^{c+dx}+cf^{2c+2dx}\right)}{2ad\log(f)}+\frac{x}{a}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*f^(c + d*x) + c*f^(2*c + 2*d*x))^(-1),x]
```

```
[Out] x/a + (b*ArcTanh[(b + 2*c*f^(c + d*x))/Sqrt[b^2 - 4*a*c]])/(a*Sqrt[b^2 - 4*
a*c]*d*Log[f]) - Log[a + b*f^(c + d*x) + c*f^(2*c + 2*d*x)]/(2*a*d*Log[f])
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 618

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> Dist[-2, Subst[I
nt[1/Simp[b^2 - 4*a*c - x^2, x], x], x, b + 2*c*x], x] /; FreeQ[{a, b, c},
x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
```

```
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 634

```
Int[((d_.) + (e_.)*(x_))/((a_) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> D
ist[(2*c*d - b*e)/(2*c), Int[1/(a + b*x + c*x^2), x], x] + Dist[e/(2*c), In
t[(b + 2*c*x)/(a + b*x + c*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && NeQ
[2*c*d - b*e, 0] && NeQ[b^2 - 4*a*c, 0] &&  !NiceSqrtQ[b^2 - 4*a*c]
```

Rule 705

```
Int[1/(((d_.) + (e_.)*(x_))*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)), x_Symbol]
 :> Dist[e^2/(c*d^2 - b*d*e + a*e^2), Int[1/(d + e*x), x], x] + Dist[1/(c*d
^2 - b*d*e + a*e^2), Int[(c*d - b*e - c*e*x)/(a + b*x + c*x^2), x], x] /; F
reeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^
2, 0] && NeQ[2*c*d - b*e, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\int \frac{1}{a+bf^{c+dx}+cf^{2c+2dx}}\,dx = \frac{\text{Subst}\left(\int \frac{1}{x(a+bx+cx^2)}\,dx, x, f^{c+dx}\right)}{d\log(f)}$$
$$= \frac{\text{Subst}\left(\int \frac{1}{x}\,dx, x, f^{c+dx}\right)}{ad\log(f)} + \frac{\text{Subst}\left(\int \frac{-b-cx}{a+bx+cx^2}\,dx, x, f^{c+dx}\right)}{ad\log(f)}$$
$$= \frac{x}{a} - \frac{\text{Subst}\left(\int \frac{b+2cx}{a+bx+cx^2}\,dx, x, f^{c+dx}\right)}{2ad\log(f)} - \frac{b\,\text{Subst}\left(\int \frac{1}{a+bx+cx^2}\,dx, x, f^{c+dx}\right)}{2ad\log(f)}$$
$$= \frac{x}{a} - \frac{\log\left(a+bf^{c+dx}+cf^{2c+2dx}\right)}{2ad\log(f)} + \frac{b\,\text{Subst}\left(\int \frac{1}{b^2-4ac-x^2}\,dx, x, b+2cf^{c+dx}\right)}{ad\log(f)}$$
$$= \frac{x}{a} + \frac{b\tanh^{-1}\left(\frac{b+2cf^{c+dx}}{\sqrt{b^2-4ac}}\right)}{a\sqrt{b^2-4ac}\,d\log(f)} - \frac{\log\left(a+bf^{c+dx}+cf^{2c+2dx}\right)}{2ad\log(f)}$$

Mathematica [A] time = 0.15, size = 93, normalized size = 0.99

$$-\frac{\frac{2b\tan^{-1}\left(\frac{b+2cf^{c+dx}}{\sqrt{4ac-b^2}}\right)}{d\log(f)\sqrt{4ac-b^2}} + \frac{\log\left(a+f^{c+dx}\left(b+cf^{c+dx}\right)\right)}{d\log(f)} - 2x}{2a}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*f^(c + d*x) + c*f^(2*c + 2*d*x))^(-1),x]
```

```
[Out] -1/2*(-2*x + (2*b*ArcTan[(b + 2*c*f^(c + d*x))/Sqrt[-b^2 + 4*a*c]])/(Sqrt[-
b^2 + 4*a*c]*d*Log[f]) + Log[a + f^(c + d*x)*(b + c*f^(c + d*x))]/(d*Log[f]
))/a
```

fricas [A] time = 0.45, size = 309, normalized size = 3.29

$$\left[\frac{2\left(b^2-4\,ac\right)dx\log(f) + \sqrt{b^2-4\,ac}\,b\log\left(\frac{2\,c^2f^{2\,dx+2\,c}+b^2-2\,ac+2\left(bc+\sqrt{b^2-4\,ac}\,c\right)f^{dx+c}+\sqrt{b^2-4\,ac}\,b}{cf^{2\,dx+2\,c}+bf^{dx+c}+a}\right) - \left(b^2-4\,ac\right)\log\left(cf^{2\,dx}\right.}{2\left(ab^2-4\,a^2c\right)d\log(f)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*f^(d*x+c)+c*f^(2*d*x+2*c)),x, algorithm="fricas")
```

```
[Out] [1/2*(2*(b^2 - 4*a*c)*d*x*log(f) + sqrt(b^2 - 4*a*c)*b*log((2*c^2*f^(2*d*x
+ 2*c) + b^2 - 2*a*c + 2*(b*c + sqrt(b^2 - 4*a*c)*c)*f^(d*x + c) + sqrt(b^2
 - 4*a*c)*b)/(c*f^(2*d*x + 2*c) + b*f^(d*x + c) + a)) - (b^2 - 4*a*c)*log(c
*f^(2*d*x + 2*c) + b*f^(d*x + c) + a))/((a*b^2 - 4*a^2*c)*d*log(f)), 1/2*(2
*(b^2 - 4*a*c)*d*x*log(f) + 2*sqrt(-b^2 + 4*a*c)*b*arctan(-(2*sqrt(-b^2 + 4
*a*c)*c*f^(d*x + c) + sqrt(-b^2 + 4*a*c)*b)/(b^2 - 4*a*c)) - (b^2 - 4*a*c)*
log(c*f^(2*d*x + 2*c) + b*f^(d*x + c) + a))/((a*b^2 - 4*a^2*c)*d*log(f))]
```

giac [A] time = 0.31, size = 114, normalized size = 1.21

$$-\frac{b\arctan\left(\frac{2\,cf^{dx}f^{c}+b}{\sqrt{-b^{2}+4\,ac}}\right)}{\sqrt{-b^{2}+4\,ac}\,ad\log(f)}-\frac{\log\left(cf^{2\,dx}f^{2\,c}+bf^{dx}f^{c}+a\right)}{2\,ad\log(f)}+\frac{\log\left(\left|f\right|^{dx}\left|f\right|^{c}\right)}{ad\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*f^(d*x+c)+c*f^(2*d*x+2*c)),x, algorithm="giac")
```

```
[Out] -b*arctan((2*c*f^(d*x)*f^c + b)/sqrt(-b^2 + 4*a*c))/(sqrt(-b^2 + 4*a*c)*a*d
*log(f)) - 1/2*log(c*f^(2*d*x)*f^(2*c) + b*f^(d*x)*f^c + a)/(a*d*log(f)) +
log(abs(f)^(d*x)*abs(f)^c)/(a*d*log(f))
```

maple [B] time = 0.11, size = 547, normalized size = 5.82

$$\frac{4ac\,d^{2}x\ln(f)^{2}}{4a^{2}c\,d^{2}\ln(f)^{2}-a\,b^{2}d^{2}\ln(f)^{2}}-\frac{b^{2}d^{2}x\ln(f)^{2}}{4a^{2}c\,d^{2}\ln(f)^{2}-a\,b^{2}d^{2}\ln(f)^{2}}+\frac{4a\,c^{2}d\ln(f)^{2}}{4a^{2}c\,d^{2}\ln(f)^{2}-a\,b^{2}d^{2}\ln(f)^{2}}-\frac{b^{2}cd\ln(}{4a^{2}c\,d^{2}\ln(f)^{2}-a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a+b*f^(d*x+c)+c*f^(2*d*x+2*c)),x)
```

```
[Out] 4/(4*ln(f)^2*a^2*c*d^2-ln(f)^2*a*b^2*d^2)*ln(f)^2*a*c*d^2*x-1/(4*ln(f)^2*a^
2*c*d^2-ln(f)^2*a*b^2*d^2)*ln(f)^2*b^2*d^2*x+4/(4*ln(f)^2*a^2*c*d^2-ln(f)^2
*a*b^2*d^2)*ln(f)^2*a*c^2*d-1/(4*ln(f)^2*a^2*c*d^2-ln(f)^2*a*b^2*d^2)*ln(f)
^2*b^2*c*d-2/(4*a*c-b^2)/d/ln(f)*ln(f^(d*x+c)-1/2*(-b^2+(-4*a*b^2*c+b^4)^(1
/2))/b/c)*c+1/2/a/(4*a*c-b^2)/d/ln(f)*ln(f^(d*x+c)-1/2*(-b^2+(-4*a*b^2*c+b^
4)^(1/2))/b/c)*b^2+1/2/a/(4*a*c-b^2)/d/ln(f)*ln(f^(d*x+c)-1/2*(-b^2+(-4*a*b
^2*c+b^4)^(1/2))/b/c)*(-4*a*b^2*c+b^4)^(1/2)-2/(4*a*c-b^2)/d/ln(f)*ln(f^(d*
x+c)+1/2*(b^2+(-4*a*b^2*c+b^4)^(1/2))/b/c)*c+1/2/a/(4*a*c-b^2)/d/ln(f)*ln(f
^(d*x+c)+1/2*(b^2+(-4*a*b^2*c+b^4)^(1/2))/b/c)*b^2-1/2/a/(4*a*c-b^2)/d/ln(f
)*ln(f^(d*x+c)+1/2*(b^2+(-4*a*b^2*c+b^4)^(1/2))/b/c)*(-4*a*b^2*c+b^4)^(1/2)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*f^(d*x+c)+c*f^(2*d*x+2*c)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*a*c-b^2>0)', see `assume?` for mo
re details)Is 4*a*c-b^2 positive or negative?
```

mupad [B] time = 3.67, size = 96, normalized size = 1.02

$$\frac{x}{a}-\frac{\ln\left(a+c\,f^{2\,d\,x}\,f^{2\,c}+b\,f^{d\,x}\,f^c\right)}{2\,a\,d\,\ln(f)}-\frac{b\,\mathrm{atan}\left(\frac{b+2\,c\,f^{d\,x}\,f^c}{\sqrt{4\,a\,c-b^2}}\right)}{a\,d\,\ln(f)\,\sqrt{4\,a\,c-b^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a + b*f^(c + d*x) + c*f^(2*c + 2*d*x)),x)
```

```
[Out] x/a - log(a + c*f^(2*d*x)*f^(2*c) + b*f^(d*x)*f^c)/(2*a*d*log(f)) - (b*atan
((b + 2*c*f^(d*x)*f^c)/(4*a*c - b^2)^(1/2)))/(a*d*log(f)*(4*a*c - b^2)^(1/2
))
```

sympy [A] time = 0.51, size = 104, normalized size = 1.11

$$\operatorname{RootSum}\left(z^2\left(4a^2cd^2\log\left(f\right)^2-ab^2d^2\log\left(f\right)^2\right)+z\left(4acd\log\left(f\right)-b^2d\log\left(f\right)\right)+c,\left(i\mapsto i\log\left(f^{c+dx}+\frac{-4ia^2cd}{}\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*f**(d*x+c)+c*f**(2*d*x+2*c)),x)
```

```
[Out] RootSum(_z**2*(4*a**2*c*d**2*log(f)**2 - a*b**2*d**2*log(f)**2) + _z*(4*a*c
*d*log(f) - b**2*d*log(f)) + c, Lambda(_i, _i*log(f**(c + d*x) + (-4*_i*a**
2*c*d*log(f) + _i*a*b**2*d*log(f) - 2*a*c + b**2)/(b*c)))) + x/a
```

3.522 $\int \frac{1}{a+bf^{g+hx}+cf^{2(g+hx)}}\,dx$

Optimal. Leaf size=94

$$\frac{b\tanh^{-1}\left(\frac{b+2cf^{g+hx}}{\sqrt{b^2-4ac}}\right)}{ah\log(f)\sqrt{b^2-4ac}}-\frac{\log\left(a+bf^{g+hx}+cf^{2g+2hx}\right)}{2ah\log(f)}+\frac{x}{a}$$

```
[Out] x/a-1/2*ln(a+b*f^(h*x+g)+c*f^(2*h*x+2*g))/a/h/ln(f)+b*arctanh((b+2*c*f^(h*x
+g))/(-4*a*c+b^2)^(1/2))/a/h/ln(f)/(-4*a*c+b^2)^(1/2)
```

Rubi [A] time = 0.09, antiderivative size = 94, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.292, Rules used = {2282, 705, 29, 634, 618, 206, 628}

$$\frac{b\tanh^{-1}\left(\frac{b+2cf^{g+hx}}{\sqrt{b^2-4ac}}\right)}{ah\log(f)\sqrt{b^2-4ac}}-\frac{\log\left(a+bf^{g+hx}+cf^{2g+2hx}\right)}{2ah\log(f)}+\frac{x}{a}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*f^(g + h*x) + c*f^(2*(g + h*x)))^(-1),x]
```

```
[Out] x/a + (b*ArcTanh[(b + 2*c*f^(g + h*x))/Sqrt[b^2 - 4*a*c]])/(a*Sqrt[b^2 - 4*
a*c]*h*Log[f]) - Log[a + b*f^(g + h*x) + c*f^(2*g + 2*h*x)]/(2*a*h*Log[f])
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 618

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> Dist[-2, Subst[I
nt[1/Simp[b^2 - 4*a*c - x^2, x], x], x, b + 2*c*x], x] /; FreeQ[{a, b, c},
x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
```

```
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 634

```
Int[((d_.) + (e_.)*(x_))/((a_) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> D
ist[(2*c*d - b*e)/(2*c), Int[1/(a + b*x + c*x^2), x], x] + Dist[e/(2*c), In
t[(b + 2*c*x)/(a + b*x + c*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && NeQ
[2*c*d - b*e, 0] && NeQ[b^2 - 4*a*c, 0] &&  !NiceSqrtQ[b^2 - 4*a*c]
```

Rule 705

```
Int[1/(((d_.) + (e_.)*(x_))*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)), x_Symbol]
 :> Dist[e^2/(c*d^2 - b*d*e + a*e^2), Int[1/(d + e*x), x], x] + Dist[1/(c*d
^2 - b*d*e + a*e^2), Int[(c*d - b*e - c*e*x)/(a + b*x + c*x^2), x], x] /; F
reeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^
2, 0] && NeQ[2*c*d - b*e, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\int \frac{1}{a+bf^{g+hx}+cf^{2(g+hx)}}\,dx = \frac{\text{Subst}\left(\int \frac{1}{x(a+bx+cx^2)}\,dx, x, f^{g+hx}\right)}{h\log(f)}$$
$$= \frac{\text{Subst}\left(\int \frac{1}{x}\,dx, x, f^{g+hx}\right)}{ah\log(f)} + \frac{\text{Subst}\left(\int \frac{-b-cx}{a+bx+cx^2}\,dx, x, f^{g+hx}\right)}{ah\log(f)}$$
$$= \frac{x}{a} - \frac{\text{Subst}\left(\int \frac{b+2cx}{a+bx+cx^2}\,dx, x, f^{g+hx}\right)}{2ah\log(f)} - \frac{b\,\text{Subst}\left(\int \frac{1}{a+bx+cx^2}\,dx, x, f^{g+hx}\right)}{2ah\log(f)}$$
$$= \frac{x}{a} - \frac{\log\left(a+bf^{g+hx}+cf^{2g+2hx}\right)}{2ah\log(f)} + \frac{b\,\text{Subst}\left(\int \frac{1}{b^2-4ac-x^2}\,dx, x, b+2cf^{g+hx}\right)}{ah\log(f)}$$
$$= \frac{x}{a} + \frac{b\tanh^{-1}\left(\frac{b+2cf^{g+hx}}{\sqrt{b^2-4ac}}\right)}{a\sqrt{b^2-4ac}\,h\log(f)} - \frac{\log\left(a+bf^{g+hx}+cf^{2g+2hx}\right)}{2ah\log(f)}$$

Mathematica [A] time = 0.15, size = 93, normalized size = 0.99

$$-\frac{\frac{2b\tan^{-1}\left(\frac{b+2cf^{g+hx}}{\sqrt{4ac-b^2}}\right)}{h\log(f)\sqrt{4ac-b^2}} + \frac{\log\left(a+f^{g+hx}\left(b+cf^{g+hx}\right)\right)}{h\log(f)} - 2x}{2a}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*f^(g + h*x) + c*f^(2*(g + h*x)))^(-1),x]
```

```
[Out] -1/2*(-2*x + (2*b*ArcTan[(b + 2*c*f^(g + h*x))/Sqrt[-b^2 + 4*a*c]])/(Sqrt[-
b^2 + 4*a*c]*h*Log[f]) + Log[a + f^(g + h*x)*(b + c*f^(g + h*x))]/(h*Log[f]
))/a
```

fricas [A] time = 0.46, size = 309, normalized size = 3.29

$$\left[\frac{2\left(b^2-4\,ac\right)hx\log(f) + \sqrt{b^2-4\,ac}\,b\log\left(\frac{2\,c^2f^{2\,hx+2\,g}+b^2-2\,ac+2\left(bc+\sqrt{b^2-4\,ac}\,c\right)f^{hx+g}+\sqrt{b^2-4\,ac}\,b}{cf^{2\,hx+2\,g}+bf^{hx+g}+a}\right) - \left(b^2-4\,ac\right)\log\left(cf^{2}\right.}{2\left(ab^2-4\,a^2c\right)h\log(f)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*f^(h*x+g)+c*f^(2*h*x+2*g)),x, algorithm="fricas")
```

```
[Out] [1/2*(2*(b^2 - 4*a*c)*h*x*log(f) + sqrt(b^2 - 4*a*c)*b*log((2*c^2*f^(2*h*x
+ 2*g) + b^2 - 2*a*c + 2*(b*c + sqrt(b^2 - 4*a*c)*c)*f^(h*x + g) + sqrt(b^2
 - 4*a*c)*b)/(c*f^(2*h*x + 2*g) + b*f^(h*x + g) + a)) - (b^2 - 4*a*c)*log(c
*f^(2*h*x + 2*g) + b*f^(h*x + g) + a))/((a*b^2 - 4*a^2*c)*h*log(f)), 1/2*(2
*(b^2 - 4*a*c)*h*x*log(f) + 2*sqrt(-b^2 + 4*a*c)*b*arctan(-(2*sqrt(-b^2 + 4
*a*c)*c*f^(h*x + g) + sqrt(-b^2 + 4*a*c)*b)/(b^2 - 4*a*c)) - (b^2 - 4*a*c)*
log(c*f^(2*h*x + 2*g) + b*f^(h*x + g) + a))/((a*b^2 - 4*a^2*c)*h*log(f))]
```

giac [A] time = 0.43, size = 114, normalized size = 1.21

$$-\frac{b\arctan\left(\frac{2\,cf^{hx}f^{g}+b}{\sqrt{-b^{2}+4\,ac}}\right)}{\sqrt{-b^{2}+4\,ac}\,ah\log(f)}-\frac{\log\left(cf^{2\,hx}f^{2\,g}+bf^{hx}f^{g}+a\right)}{2\,ah\log(f)}+\frac{\log\left(\left|f\right|^{hx}\left|f\right|^{g}\right)}{ah\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*f^(h*x+g)+c*f^(2*h*x+2*g)),x, algorithm="giac")
```

```
[Out] -b*arctan((2*c*f^(h*x)*f^g + b)/sqrt(-b^2 + 4*a*c))/(sqrt(-b^2 + 4*a*c)*a*h
*log(f)) - 1/2*log(c*f^(2*h*x)*f^(2*g) + b*f^(h*x)*f^g + a)/(a*h*log(f)) +
log(abs(f)^(h*x)*abs(f)^g)/(a*h*log(f))
```

maple [B] time = 0.11, size = 546, normalized size = 5.81

$$\frac{4ac\,h^{2}x\ln(f)^{2}}{4a^{2}c\,h^{2}\ln(f)^{2}-a\,b^{2}h^{2}\ln(f)^{2}}-\frac{b^{2}h^{2}x\ln(f)^{2}}{4a^{2}c\,h^{2}\ln(f)^{2}-a\,b^{2}h^{2}\ln(f)^{2}}+\frac{4acgh\ln(f)^{2}}{4a^{2}c\,h^{2}\ln(f)^{2}-a\,b^{2}h^{2}\ln(f)^{2}}-\frac{b^{2}gh\ln(f)}{4a^{2}c\,h^{2}\ln(f)^{2}-a\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a+b*f^(h*x+g)+c*f^(2*h*x+2*g)),x)
```

```
[Out] 4/(4*ln(f)^2*a^2*c*h^2-ln(f)^2*a*b^2*h^2)*ln(f)^2*a*c*h^2*x-1/(4*ln(f)^2*a^
2*c*h^2-ln(f)^2*a*b^2*h^2)*ln(f)^2*b^2*h^2*x+4/(4*ln(f)^2*a^2*c*h^2-ln(f)^2
*a*b^2*h^2)*ln(f)^2*a*c*g*h-1/(4*ln(f)^2*a^2*c*h^2-ln(f)^2*a*b^2*h^2)*ln(f)
^2*b^2*g*h-2/(4*a*c-b^2)/h/ln(f)*ln(f^(h*x+g)-1/2*(-b^2+(-4*a*b^2*c+b^4)^(1
/2))/b/c)*c+1/2/a/(4*a*c-b^2)/h/ln(f)*ln(f^(h*x+g)-1/2*(-b^2+(-4*a*b^2*c+b^
4)^(1/2))/b/c)*b^2+1/2/a/(4*a*c-b^2)/h/ln(f)*ln(f^(h*x+g)-1/2*(-b^2+(-4*a*b
^2*c+b^4)^(1/2))/b/c)*(-4*a*b^2*c+b^4)^(1/2)-2/(4*a*c-b^2)/h/ln(f)*ln(f^(h*
x+g)+1/2*(b^2+(-4*a*b^2*c+b^4)^(1/2))/b/c)*c+1/2/a/(4*a*c-b^2)/h/ln(f)*ln(f
^(h*x+g)+1/2*(b^2+(-4*a*b^2*c+b^4)^(1/2))/b/c)*b^2-1/2/a/(4*a*c-b^2)/h/ln(f
)*ln(f^(h*x+g)+1/2*(b^2+(-4*a*b^2*c+b^4)^(1/2))/b/c)*(-4*a*b^2*c+b^4)^(1/2)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*f^(h*x+g)+c*f^(2*h*x+2*g)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*a*c-b^2>0)', see `assume?` for mo
re details)Is 4*a*c-b^2 positive or negative?
```

mupad [B] time = 3.81, size = 96, normalized size = 1.02

$$\frac{x}{a}-\frac{\ln\left(a+c\,f^{2\,h\,x}\,f^{2\,g}+b\,f^{h\,x}\,f^g\right)}{2\,a\,h\,\ln(f)}-\frac{b\,\mathrm{atan}\left(\frac{b+2\,c\,f^{h\,x}\,f^g}{\sqrt{4\,a\,c-b^2}}\right)}{a\,h\,\ln(f)\,\sqrt{4\,a\,c-b^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a + b*f^(g + h*x) + c*f^(2*g + 2*h*x)),x)
```

```
[Out] x/a - log(a + c*f^(2*h*x)*f^(2*g) + b*f^(h*x)*f^g)/(2*a*h*log(f)) - (b*atan
((b + 2*c*f^(h*x)*f^g)/(4*a*c - b^2)^(1/2)))/(a*h*log(f)*(4*a*c - b^2)^(1/2
))
```

sympy [A] time = 0.50, size = 104, normalized size = 1.11

$$\mathrm{RootSum}\left(z^2\left(4a^2ch^2\log\left(f\right)^2-ab^2h^2\log\left(f\right)^2\right)+z\left(4ach\log\left(f\right)-b^2h\log\left(f\right)\right)+c,\left(i\mapsto i\log\left(f^{g+hx}+\frac{-4ia^2c\ldots}{}\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*f**(h*x+g)+c*f**(2*h*x+2*g)),x)
```

```
[Out] RootSum(_z**2*(4*a**2*c*h**2*log(f)**2 - a*b**2*h**2*log(f)**2) + _z*(4*a*c
*h*log(f) - b**2*h*log(f)) + c, Lambda(_i, _i*log(f**(g + h*x) + (-4*_i*a**
2*c*h*log(f) + _i*a*b**2*h*log(f) - 2*a*c + b**2)/(b*c)))) + x/a
```

3.523 $\int \frac{x}{1+2f^{c+dx}+f^{2c+2dx}}\,dx$

Optimal. Leaf size=96

$$-\frac{\text{Li}_2\left(-f^{c+dx}\right)}{d^2\log^2(f)}+\frac{\log\left(f^{c+dx}+1\right)}{d^2\log^2(f)}-\frac{x\log\left(f^{c+dx}+1\right)}{d\log(f)}+\frac{x}{d\log(f)\left(f^{c+dx}+1\right)}-\frac{x}{d\log(f)}+\frac{x^2}{2}$$

```
[Out] 1/2*x^2-x/d/ln(f)+x/d/(1+f^(d*x+c))/ln(f)+ln(1+f^(d*x+c))/d^2/ln(f)^2-x*ln(
1+f^(d*x+c))/d/ln(f)-polylog(2,-f^(d*x+c))/d^2/ln(f)^2
```

Rubi [A] time = 0.27, antiderivative size = 96, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 11, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.440, Rules used = {6688, 2185, 2184, 2190, 2279, 2391, 2191, 2282, 36, 29, 31}

$$-\frac{\text{PolyLog}\left(2,-f^{c+dx}\right)}{d^2\log^2(f)}+\frac{\log\left(f^{c+dx}+1\right)}{d^2\log^2(f)}-\frac{x\log\left(f^{c+dx}+1\right)}{d\log(f)}+\frac{x}{d\log(f)\left(f^{c+dx}+1\right)}-\frac{x}{d\log(f)}+\frac{x^2}{2}$$

Antiderivative was successfully verified.

```
[In] Int[x/(1 + 2*f^(c + d*x) + f^(2*c + 2*d*x)),x]
```

```
[Out] x^2/2 - x/(d*Log[f]) + x/(d*(1 + f^(c + d*x))*Log[f]) + Log[1 + f^(c + d*x)
]/(d^2*Log[f]^2) - (x*Log[1 + f^(c + d*x)])/(d*Log[f]) - PolyLog[2, -f^(c +
 d*x)]/(d^2*Log[f]^2)
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 2184

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
```

```
b/a, Int[((c + d*x)^m*(F^(g*(e + f*x)))^n)/(a + b*(F^(g*(e + f*x)))^n), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2185

```
Int[((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.))^(p_)*((c_.) +
(d_.)*(x_))^(m_.), x_Symbol] :> Dist[1/a, Int[(c + d*x)^m*(a + b*(F^(g*(e +
 f*x)))^n)^(p + 1), x], x] - Dist[b/a, Int[(c + d*x)^m*(F^(g*(e + f*x)))^n*
(a + b*(F^(g*(e + f*x)))^n)^p, x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n},
 x] && ILtQ[p, 0] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2191

```
Int[((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((a_.) + (b_.)*((F_)^((g_.)*(
(e_.) + (f_.)*(x_))))^(n_.))^(p_.)*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :>
 Simp[((c + d*x)^m*(a + b*(F^(g*(e + f*x)))^n)^(p + 1))/(b*f*g*n*(p + 1)*Lo
g[F]), x] - Dist[(d*m)/(b*f*g*n*(p + 1)*Log[F]), Int[(c + d*x)^(m - 1)*(a +
 b*(F^(g*(e + f*x)))^n)^(p + 1), x], x] /; FreeQ[{F, a, b, c, d, e, f, g, m
, n, p}, x] && NeQ[p, -1]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rubi steps

$$\int \frac{x}{1+2f^{c+dx}+f^{2c+2dx}}\,dx = \int \frac{x}{\left(1+f^{c+dx}\right)^2}\,dx$$

$$= -\int \frac{f^{c+dx}x}{\left(1+f^{c+dx}\right)^2}\,dx + \int \frac{x}{1+f^{c+dx}}\,dx$$

$$= \frac{x^2}{2} + \frac{x}{d\left(1+f^{c+dx}\right)\log(f)} - \frac{\int \frac{1}{1+f^{c+dx}}\,dx}{d\log(f)} - \int \frac{f^{c+dx}x}{1+f^{c+dx}}\,dx$$

$$= \frac{x^2}{2} + \frac{x}{d\left(1+f^{c+dx}\right)\log(f)} - \frac{x\log\left(1+f^{c+dx}\right)}{d\log(f)} - \frac{\text{Subst}\left(\int \frac{1}{x(1+x)}\,dx, x, f^{c+dx}\right)}{d^2\log^2(f)} + \frac{\int \text{l}}{}$$

$$= \frac{x^2}{2} + \frac{x}{d\left(1+f^{c+dx}\right)\log(f)} - \frac{x\log\left(1+f^{c+dx}\right)}{d\log(f)} - \frac{\text{Subst}\left(\int \frac{1}{x}\,dx, x, f^{c+dx}\right)}{d^2\log^2(f)} + \frac{\text{Subst}\left(\right.}{}$$

$$= \frac{x^2}{2} - \frac{x}{d\log(f)} + \frac{x}{d\left(1+f^{c+dx}\right)\log(f)} + \frac{\log\left(1+f^{c+dx}\right)}{d^2\log^2(f)} - \frac{x\log\left(1+f^{c+dx}\right)}{d\log(f)} - \frac{\text{Li}_2\left(\right.}{d^2\text{l}}$$

Mathematica [A] time = 0.18, size = 88, normalized size = 0.92

$$-\frac{\text{Li}_2\left(-f^{c+dx}\right)}{d^2\log^2(f)} + \frac{\log\left(f^{c+dx}+1\right)}{d^2\log^2(f)} + \frac{1}{2}x\left(\frac{2}{d\log(f)f^{c+dx}+d\log(f)}+x\right) - \frac{x\left(\log\left(f^{c+dx}+1\right)+1\right)}{d\log(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[x/(1 + 2*f^(c + d*x) + f^(2*c + 2*d*x)),x]
```

```
[Out] (x*(x + 2/(d*Log[f] + d*f^(c + d*x)*Log[f])))/2 + Log[1 + f^(c + d*x)]/(d^2
*Log[f]^2) - (x*(1 + Log[1 + f^(c + d*x)]))/(d*Log[f]) - PolyLog[2, -f^(c +
 d*x)]/(d^2*Log[f]^2)
```

fricas [A] time = 0.42, size = 143, normalized size = 1.49

$$\frac{\left(d^2x^2-c^2\right)\log(f)^2+\left(\left(d^2x^2-c^2\right)\log(f)^2-2\,(dx+c)\log(f)\right)f^{dx+c}-2\left(f^{dx+c}+1\right)\mathrm{Li}_2\left(-f^{dx+c}\right)-2\left(dx\log(f)\right.}{2\left(d^2f^{dx+c}\log(f)^2+d^2\log(f)^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(1+2*f^(d*x+c)+f^(2*d*x+2*c)),x, algorithm="fricas")
```

```
[Out] 1/2*((d^2*x^2 - c^2)*log(f)^2 + ((d^2*x^2 - c^2)*log(f)^2 - 2*(d*x + c)*log
(f))*f^(d*x + c) - 2*(f^(d*x + c) + 1)*dilog(-f^(d*x + c)) - 2*(d*x*log(f)
+ (d*x*log(f) - 1)*f^(d*x + c) - 1)*log(f^(d*x + c) + 1) - 2*c*log(f))/(d^2
*f^(d*x + c)*log(f)^2 + d^2*log(f)^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{f^{2\,dx+2\,c}+2\,f^{dx+c}+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(1+2*f^(d*x+c)+f^(2*d*x+2*c)),x, algorithm="giac")
```

```
[Out] integrate(x/(f^(2*d*x + 2*c) + 2*f^(d*x + c) + 1), x)
```

maple [A] time = 0.08, size = 143, normalized size = 1.49

$$\frac{x^2}{2}+\frac{cx}{d}+\frac{c^2}{2d^2}-\frac{x\ln\left(f^cf^{dx}+1\right)}{d\ln(f)}-\frac{c\ln\left(f^cf^{dx}\right)}{d^2\ln(f)}+\frac{x}{\left(f^{dx+c}+1\right)d\ln(f)}-\frac{\mathrm{polylog}\left(2,-f^cf^{dx}\right)}{d^2\ln(f)^2}-\frac{\ln\left(f^cf^{dx}\right)}{d^2\ln(f)^2}+\frac{\ln\left(f^cf^{dx}\right.}{d^2\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(1+2*f^(d*x+c)+f^(2*d*x+2*c)),x)
```

```
[Out] x/d/(1+f^(d*x+c))/ln(f)+1/2*x^2+c/d*x+1/2*c^2/d^2-1/d/ln(f)*ln(f^(d*x)*f^c+
1)*x-1/d^2/ln(f)^2*polylog(2,-f^(d*x)*f^c)+1/d^2/ln(f)^2*ln(f^(d*x)*f^c+1)-
1/d^2/ln(f)^2*ln(f^(d*x)*f^c)-1/d^2/ln(f)*c*ln(f^(d*x)*f^c)
```

maxima [A] time = 1.04, size = 95, normalized size = 0.99

$$\frac{1}{2}\,x^2+\frac{x}{df^{dx}f^c\log(f)+d\log(f)}-\frac{x}{d\log(f)}-\frac{dx\log\left(f^{dx}f^c+1\right)\log(f)+\mathrm{Li}_2\left(-f^{dx}f^c\right)}{d^2\log(f)^2}+\frac{\log\left(f^{dx}f^c+1\right)}{d^2\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(1+2*f^(d*x+c)+f^(2*d*x+2*c)),x, algorithm="maxima")
```

```
[Out] 1/2*x^2 + x/(d*f^(d*x)*f^c*log(f) + d*log(f)) - x/(d*log(f)) - (d*x*log(f^(
d*x)*f^c + 1)*log(f) + dilog(-f^(d*x)*f^c))/(d^2*log(f)^2) + log(f^(d*x)*f^
c + 1)/(d^2*log(f)^2)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x}{f^{2\,c+2\,d\,x}+2\,f^{c+d\,x}+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(f^(2*c + 2*d*x) + 2*f^(c + d*x) + 1),x)
```

```
[Out] int(x/(f^(2*c + 2*d*x) + 2*f^(c + d*x) + 1), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{x}{df^{c+dx}\log\left(f\right)+d\log\left(f\right)}+\frac{\int\frac{dx\log\left(f\right)}{e^{c\log\left(f\right)}e^{dx\log\left(f\right)}+1}\,dx+\int\left(-\frac{1}{e^{c\log\left(f\right)}e^{dx\log\left(f\right)}+1}\right)dx}{d\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(1+2*f**(d*x+c)+f**(2*d*x+2*c)),x)
```

```
[Out] x/(d*f**(c + d*x)*log(f) + d*log(f)) + (Integral(d*x*log(f)/(exp(c*log(f))*
exp(d*x*log(f)) + 1), x) + Integral(-1/(exp(c*log(f))*exp(d*x*log(f)) + 1),
 x))/(d*log(f))
```

3.524 $\int \frac{x}{a+bf^{c+dx}+cf^{2c+2dx}}\,dx$

Optimal. Leaf size=338

$$-\frac{2c\text{Li}_2\left(-\frac{2cf^{c+dx}}{b-\sqrt{b^2-4ac}}\right)}{d^2\log^2(f)\sqrt{b^2-4ac}\left(b-\sqrt{b^2-4ac}\right)}+\frac{2c\text{Li}_2\left(-\frac{2cf^{c+dx}}{b+\sqrt{b^2-4ac}}\right)}{d^2\log^2(f)\sqrt{b^2-4ac}\left(\sqrt{b^2-4ac}+b\right)}-\frac{2cx\log\left(\frac{2cf^{c+dx}}{b-\sqrt{b^2-4ac}}+1\right)}{d\log(f)\sqrt{b^2-4ac}\left(b-\sqrt{b^2-\right.}}$$

```
[Out] -2*c*x*ln(1+2*c*f^(d*x+c)/(b-(-4*a*c+b^2)^(1/2)))/d/ln(f)/(b-(-4*a*c+b^2)^(
1/2))/(-4*a*c+b^2)^(1/2)-2*c*polylog(2,-2*c*f^(d*x+c)/(b-(-4*a*c+b^2)^(1/2)
))/d^2/ln(f)^2/(b-(-4*a*c+b^2)^(1/2))/(-4*a*c+b^2)^(1/2)+2*c*x*ln(1+2*c*f^(
d*x+c)/(b+(-4*a*c+b^2)^(1/2)))/d/ln(f)/(-4*a*c+b^2)^(1/2)/(b+(-4*a*c+b^2)^(
1/2))+2*c*polylog(2,-2*c*f^(d*x+c)/(b+(-4*a*c+b^2)^(1/2)))/d^2/ln(f)^2/(-4*
a*c+b^2)^(1/2)/(b+(-4*a*c+b^2)^(1/2))-c*x^2/(b^2-4*a*c-b*(-4*a*c+b^2)^(1/2)
)-c*x^2/(b^2-4*a*c+b*(-4*a*c+b^2)^(1/2))
```

Rubi [A] time = 0.69, antiderivative size = 338, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.185, Rules used = {2263, 2184, 2190, 2279, 2391}

$$-\frac{2c\text{PolyLog}\left(2,-\frac{2cf^{c+dx}}{b-\sqrt{b^2-4ac}}\right)}{d^2\log^2(f)\sqrt{b^2-4ac}\left(b-\sqrt{b^2-4ac}\right)}+\frac{2c\text{PolyLog}\left(2,-\frac{2cf^{c+dx}}{\sqrt{b^2-4ac}+b}\right)}{d^2\log^2(f)\sqrt{b^2-4ac}\left(\sqrt{b^2-4ac}+b\right)}-\frac{2cx\log\left(\frac{2cf^{c+dx}}{b-\sqrt{b^2-4ac}}+1\right)}{d\log(f)\sqrt{b^2-4ac}\left(b-\sqrt{b^2-\right.}}$$

Antiderivative was successfully verified.

```
[In] Int[x/(a + b*f^(c + d*x) + c*f^(2*c + 2*d*x)),x]
```

```
[Out] -((c*x^2)/(b^2 - 4*a*c - b*Sqrt[b^2 - 4*a*c])) - (c*x^2)/(b^2 - 4*a*c + b*S
qrt[b^2 - 4*a*c]) - (2*c*x*Log[1 + (2*c*f^(c + d*x))/(b - Sqrt[b^2 - 4*a*c]
)])/(Sqrt[b^2 - 4*a*c]*(b - Sqrt[b^2 - 4*a*c])*d*Log[f]) + (2*c*x*Log[1 + (
2*c*f^(c + d*x))/(b + Sqrt[b^2 - 4*a*c])])/(Sqrt[b^2 - 4*a*c]*(b + Sqrt[b^2
 - 4*a*c])*d*Log[f]) - (2*c*PolyLog[2, (-2*c*f^(c + d*x))/(b - Sqrt[b^2 - 4
*a*c])])/(Sqrt[b^2 - 4*a*c]*(b - Sqrt[b^2 - 4*a*c])*d^2*Log[f]^2) + (2*c*Po
lyLog[2, (-2*c*f^(c + d*x))/(b + Sqrt[b^2 - 4*a*c])])/(Sqrt[b^2 - 4*a*c]*(b
 + Sqrt[b^2 - 4*a*c])*d^2*Log[f]^2)
```

Rule 2184

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[((c + d*x)^m*(F^(g*(e + f*x)))^n)/(a + b*(F^(g*(e + f*x)))^n), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2263

```
Int[((f_.) + (g_.)*(x_))^(m_.)/((a_.) + (b_.)*(F_)^(u_) + (c_.)*(F_)^(v_)),
 x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[(2*c)/q, Int[(f + g*x)^m/
(b - q + 2*c*F^u), x], x] - Dist[(2*c)/q, Int[(f + g*x)^m/(b + q + 2*c*F^u)
, x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v, 2*u] && LinearQ[u, x] &
& NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x}{a+bf^{c+dx}+cf^{2c+2dx}}\,dx = \frac{(2c)\int \frac{x}{b-\sqrt{b^2-4ac}+2cf^{c+dx}}\,dx}{\sqrt{b^2-4ac}} - \frac{(2c)\int \frac{x}{b+\sqrt{b^2-4ac}+2cf^{c+dx}}\,dx}{\sqrt{b^2-4ac}}$$

$$= -\frac{cx^2}{b^2-4ac-b\sqrt{b^2-4ac}} - \frac{cx^2}{b^2-4ac+b\sqrt{b^2-4ac}} + \frac{\left(4c^2\right)\int \frac{f^{c+dx}x}{b-\sqrt{b^2-4ac}+2cf^{c+dx}}\,dx}{b^2-4ac-b\sqrt{b^2-4ac}}$$

$$= -\frac{cx^2}{b^2-4ac-b\sqrt{b^2-4ac}} - \frac{cx^2}{b^2-4ac+b\sqrt{b^2-4ac}} + \frac{2cx\log\left(1+\frac{2cf^{c+dx}}{b-\sqrt{b^2-4ac}}\right.}{\left(b^2-4ac-b\sqrt{b^2-4ac}\right)d\,\mathrm{l}}$$

$$= -\frac{cx^2}{b^2-4ac-b\sqrt{b^2-4ac}} - \frac{cx^2}{b^2-4ac+b\sqrt{b^2-4ac}} + \frac{2cx\log\left(1+\frac{2cf^{c+dx}}{b-\sqrt{b^2-4ac}}\right.}{\left(b^2-4ac-b\sqrt{b^2-4ac}\right)d\,\mathrm{l}}$$

$$= -\frac{cx^2}{b^2-4ac-b\sqrt{b^2-4ac}} - \frac{cx^2}{b^2-4ac+b\sqrt{b^2-4ac}} + \frac{2cx\log\left(1+\frac{2cf^{c+dx}}{b-\sqrt{b^2-4ac}}\right.}{\left(b^2-4ac-b\sqrt{b^2-4ac}\right)d\,\mathrm{l}}$$

Mathematica [F] time = 5.33, size = 0, normalized size = 0.00

$$\int \frac{x}{a+bf^{c+dx}+cf^{2c+2dx}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x/(a + b*f^(c + d*x) + c*f^(2*c + 2*d*x)),x]
[Out] Integrate[x/(a + b*f^(c + d*x) + c*f^(2*c + 2*d*x)), x]
```

fricas [A] time = 0.45, size = 497, normalized size = 1.47

$$\frac{\left(b^2-4\,ac\right)d^2x^2\log(f)^2 - \left(ab\sqrt{\frac{b^2-4\,ac}{a^2}}+b^2-4\,ac\right)\mathrm{Li}_2\left(-\frac{\left(a\sqrt{\frac{b^2-4\,ac}{a^2}}+b\right)f^{dx+c}+2\,a}{2\,a}+1\right) + \left(ab\sqrt{\frac{b^2-4\,ac}{a^2}}-b^2+4\,ac\right)\mathrm{Li}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a+b*f^(d*x+c)+c*f^(2*d*x+2*c)),x, algorithm="fricas")
```

```
[Out] 1/2*((b^2 - 4*a*c)*d^2*x^2*log(f)^2 - (a*b*sqrt((b^2 - 4*a*c)/a^2) + b^2 -
4*a*c)*dilog(-1/2*((a*sqrt((b^2 - 4*a*c)/a^2) + b)*f^(d*x + c) + 2*a)/a + 1
) + (a*b*sqrt((b^2 - 4*a*c)/a^2) - b^2 + 4*a*c)*dilog(1/2*((a*sqrt((b^2 - 4
*a*c)/a^2) - b)*f^(d*x + c) - 2*a)/a + 1) - (a*b*c*sqrt((b^2 - 4*a*c)/a^2)*
log(f) - (b^2*c - 4*a*c^2)*log(f))*log(2*c*f^(d*x + c) + a*sqrt((b^2 - 4*a*
c)/a^2) + b) + (a*b*c*sqrt((b^2 - 4*a*c)/a^2)*log(f) + (b^2*c - 4*a*c^2)*lo
g(f))*log(2*c*f^(d*x + c) - a*sqrt((b^2 - 4*a*c)/a^2) + b) - ((a*b*d*x + a*
b*c)*sqrt((b^2 - 4*a*c)/a^2)*log(f) + (b^2*c - 4*a*c^2 + (b^2 - 4*a*c)*d*x)
*log(f))*log(1/2*((a*sqrt((b^2 - 4*a*c)/a^2) + b)*f^(d*x + c) + 2*a)/a) + (
(a*b*d*x + a*b*c)*sqrt((b^2 - 4*a*c)/a^2)*log(f) - (b^2*c - 4*a*c^2 + (b^2
- 4*a*c)*d*x)*log(f))*log(-1/2*((a*sqrt((b^2 - 4*a*c)/a^2) - b)*f^(d*x + c)
 - 2*a)/a))/((a*b^2 - 4*a^2*c)*d^2*log(f)^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{cf^{2\,dx+2\,c} + bf^{dx+c} + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a+b*f^(d*x+c)+c*f^(2*d*x+2*c)),x, algorithm="giac")
```

```
[Out] integrate(x/(c*f^(2*d*x + 2*c) + b*f^(d*x + c) + a), x)
```

maple [B] time = 0.10, size = 855, normalized size = 2.53

$$\frac{x^2}{2a} - \frac{bx\ln\left(\frac{-2cf^cf^{dx}-b+\sqrt{-4ac+b^2}}{-b+\sqrt{-4ac+b^2}}\right)}{2\sqrt{-4ac+b^2}\;ad\ln(f)} + \frac{bx\ln\left(\frac{2cf^cf^{dx}+b+\sqrt{-4ac+b^2}}{b+\sqrt{-4ac+b^2}}\right)}{2\sqrt{-4ac+b^2}\;ad\ln(f)} + \frac{cx}{ad} + \frac{bc\arctan\left(\frac{2cf^cf^{dx}+b}{\sqrt{4ac-b^2}}\right)}{\sqrt{4ac-b^2}\;ad^2\ln(f)} - \frac{bc\ln\left(\frac{-2cf^cf^{dx}-b+\sqrt{-4ac+b^2}}{-b+\sqrt{-4ac+b^2}}\right)}{2\sqrt{-4ac+b^2}\;ad^2\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a+b*f^(d*x+c)+c*f^(2*d*x+2*c)),x)
```

```
[Out] -1/2/d/ln(f)/a*ln((-2*c*f^c*f^(d*x)+(-4*a*c+b^2)^(1/2)-b)/(-b+(-4*a*c+b^2)^
(1/2)))*x-1/2/d^2/ln(f)/a*ln((-2*c*f^c*f^(d*x)+(-4*a*c+b^2)^(1/2)-b)/(-b+(-
4*a*c+b^2)^(1/2)))*c-1/2/d/ln(f)/a/(-4*a*c+b^2)^(1/2)*ln((-2*c*f^c*f^(d*x)+
(-4*a*c+b^2)^(1/2)-b)/(-b+(-4*a*c+b^2)^(1/2)))*b*x-1/2/d^2/ln(f)/a/(-4*a*c+
b^2)^(1/2)*ln((-2*c*f^c*f^(d*x)+(-4*a*c+b^2)^(1/2)-b)/(-b+(-4*a*c+b^2)^(1/2
)))*b*c-1/2/d/ln(f)/a*ln((2*c*f^c*f^(d*x)+(-4*a*c+b^2)^(1/2)+b)/(b+(-4*a*c+
b^2)^(1/2)))*x-1/2/d^2/ln(f)/a*ln((2*c*f^c*f^(d*x)+(-4*a*c+b^2)^(1/2)+b)/(b
+(-4*a*c+b^2)^(1/2)))*c+1/2/d/ln(f)/a/(-4*a*c+b^2)^(1/2)*ln((2*c*f^c*f^(d*x
)+(-4*a*c+b^2)^(1/2)+b)/(b+(-4*a*c+b^2)^(1/2)))*b*x+1/2/d^2/ln(f)/a/(-4*a*c
+b^2)^(1/2)*ln((2*c*f^c*f^(d*x)+(-4*a*c+b^2)^(1/2)+b)/(b+(-4*a*c+b^2)^(1/2)
))*b*c-1/2/d^2/ln(f)^2/a*dilog((2*c*f^c*f^(d*x)+(-4*a*c+b^2)^(1/2)+b)/(b+(-
4*a*c+b^2)^(1/2)))+1/2/d^2/ln(f)^2/a/(-4*a*c+b^2)^(1/2)*dilog((2*c*f^c*f^(d
```

```
*x)+(-4*a*c+b^2)^(1/2)+b)/(b+(-4*a*c+b^2)^(1/2)))*b-1/2/d^2/ln(f)^2/a*dilog
((-2*c*f^c*f^(d*x)+(-4*a*c+b^2)^(1/2)-b)/(-b+(-4*a*c+b^2)^(1/2)))-1/2/d^2/l
n(f)^2/a/(-4*a*c+b^2)^(1/2)*dilog((-2*c*f^c*f^(d*x)+(-4*a*c+b^2)^(1/2)-b)/(
-b+(-4*a*c+b^2)^(1/2)))*b+1/2/a*x^2+1/a*c/d*x+1/2/a*c^2/d^2+1/2/d^2/ln(f)*c
/a*ln(a+b*f^c*f^(d*x)+c*(f^c)^2*(f^(d*x))^2)+1/d^2/ln(f)*c/a*b/(4*a*c-b^2)^
(1/2)*arctan((2*c*f^c*f^(d*x)+b)/(4*a*c-b^2)^(1/2))-1/d^2/ln(f)*c/a*ln(f^c*
f^(d*x))
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a+b*f^(d*x+c)+c*f^(2*d*x+2*c)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*a*c-b^2>0)', see `assume?` for mo
re details)Is 4*a*c-b^2 positive or negative?
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x}{a+b\,f^{c+d\,x}+c\,f^{2\,c+2\,d\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a + b*f^(c + d*x) + c*f^(2*c + 2*d*x)),x)
```

```
[Out] int(x/(a + b*f^(c + d*x) + c*f^(2*c + 2*d*x)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{a+bf^{c}f^{dx}+cf^{2c}f^{2dx}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a+b*f**(d*x+c)+c*f**(2*d*x+2*c)),x)
```

```
[Out] Integral(x/(a + b*f**c*f**(d*x) + c*f**(2*c)*f**(2*d*x)), x)
```

3.525 $\int \frac{x^2}{1+2f^{c+dx}+f^{2c+2dx}}\,dx$

Optimal. Leaf size=145

$$\frac{2\text{Li}_2\left(-f^{c+dx}\right)}{d^3\log^3(f)}+\frac{2\text{Li}_3\left(-f^{c+dx}\right)}{d^3\log^3(f)}-\frac{2x\text{Li}_2\left(-f^{c+dx}\right)}{d^2\log^2(f)}+\frac{2x\log\left(f^{c+dx}+1\right)}{d^2\log^2(f)}-\frac{x^2\log\left(f^{c+dx}+1\right)}{d\log(f)}+\frac{x^2}{d\log(f)\left(f^{c+dx}+1\right)}-\frac{}{d\,\text{l}}$$

```
[Out] 1/3*x^3-x^2/d/ln(f)+x^2/d/(1+f^(d*x+c))/ln(f)+2*x*ln(1+f^(d*x+c))/d^2/ln(f)
^2-x^2*ln(1+f^(d*x+c))/d/ln(f)+2*polylog(2,-f^(d*x+c))/d^3/ln(f)^3-2*x*poly
log(2,-f^(d*x+c))/d^2/ln(f)^2+2*polylog(3,-f^(d*x+c))/d^3/ln(f)^3
```

Rubi [A] time = 0.42, antiderivative size = 145, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 10, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.370, Rules used = {6688, 2185, 2184, 2190, 2531, 2282, 6589, 2191, 2279, 2391}

$$-\frac{2x\text{PolyLog}\left(2,-f^{c+dx}\right)}{d^2\log^2(f)}+\frac{2\text{PolyLog}\left(2,-f^{c+dx}\right)}{d^3\log^3(f)}+\frac{2\text{PolyLog}\left(3,-f^{c+dx}\right)}{d^3\log^3(f)}+\frac{2x\log\left(f^{c+dx}+1\right)}{d^2\log^2(f)}-\frac{x^2\log\left(f^{c+dx}+1\right)}{d\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/(1 + 2*f^(c + d*x) + f^(2*c + 2*d*x)),x]
```

```
[Out] x^3/3 - x^2/(d*Log[f]) + x^2/(d*(1 + f^(c + d*x))*Log[f]) + (2*x*Log[1 + f^
(c + d*x)])/(d^2*Log[f]^2) - (x^2*Log[1 + f^(c + d*x)])/(d*Log[f]) + (2*Pol
yLog[2, -f^(c + d*x)])/(d^3*Log[f]^3) - (2*x*PolyLog[2, -f^(c + d*x)])/(d^2
*Log[f]^2) + (2*PolyLog[3, -f^(c + d*x)])/(d^3*Log[f]^3)
```

Rule 2184

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[((c + d*x)^m*(F^(g*(e + f*x)))^n)/(a + b*(F^(g*(e + f*x)))^n), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2185

```
Int[((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.))^(p_)*((c_.) +
(d_.)*(x_))^(m_.), x_Symbol] :> Dist[1/a, Int[(c + d*x)^m*(a + b*(F^(g*(e +
 f*x)))^n)^(p + 1), x], x] - Dist[b/a, Int[(c + d*x)^m*(F^(g*(e + f*x)))^n*
(a + b*(F^(g*(e + f*x)))^n)^p, x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n},
 x] && ILtQ[p, 0] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2191

```
Int[((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((a_.) + (b_.)*((F_)^((g_.)*(
(e_.) + (f_.)*(x_))))^(n_.))^(p_.)*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :>
 Simp[((c + d*x)^m*(a + b*(F^(g*(e + f*x)))^n)^(p + 1))/(b*f*g*n*(p + 1)*Lo
g[F]), x] - Dist[(d*m)/(b*f*g*n*(p + 1)*Log[F]), Int[(c + d*x)^(m - 1)*(a +
 b*(F^(g*(e + f*x)))^n)^(p + 1), x], x] /; FreeQ[{F, a, b, c, d, e, f, g, m
, n, p}, x] && NeQ[p, -1]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rubi steps

$$\int \frac{x^2}{1+2f^{c+dx}+f^{2c+2dx}}\,dx = \int \frac{x^2}{\left(1+f^{c+dx}\right)^2}\,dx$$
$$= -\int \frac{f^{c+dx}x^2}{\left(1+f^{c+dx}\right)^2}\,dx + \int \frac{x^2}{1+f^{c+dx}}\,dx$$
$$= \frac{x^3}{3} + \frac{x^2}{d\left(1+f^{c+dx}\right)\log(f)} - \frac{2\int \frac{x}{1+f^{c+dx}}\,dx}{d\log(f)} - \int \frac{f^{c+dx}x^2}{1+f^{c+dx}}\,dx$$
$$= \frac{x^3}{3} - \frac{x^2}{d\log(f)} + \frac{x^2}{d\left(1+f^{c+dx}\right)\log(f)} - \frac{x^2\log\left(1+f^{c+dx}\right)}{d\log(f)} + \frac{2\int \frac{f^{c+dx}x}{1+f^{c+dx}}\,dx}{d\log(f)} + \frac{2\int x$$
$$= \frac{x^3}{3} - \frac{x^2}{d\log(f)} + \frac{x^2}{d\left(1+f^{c+dx}\right)\log(f)} + \frac{2x\log\left(1+f^{c+dx}\right)}{d^2\log^2(f)} - \frac{x^2\log\left(1+f^{c+dx}\right)}{d\log(f)} - 2$$
$$= \frac{x^3}{3} - \frac{x^2}{d\log(f)} + \frac{x^2}{d\left(1+f^{c+dx}\right)\log(f)} + \frac{2x\log\left(1+f^{c+dx}\right)}{d^2\log^2(f)} - \frac{x^2\log\left(1+f^{c+dx}\right)}{d\log(f)} - 2$$
$$= \frac{x^3}{3} - \frac{x^2}{d\log(f)} + \frac{x^2}{d\left(1+f^{c+dx}\right)\log(f)} + \frac{2x\log\left(1+f^{c+dx}\right)}{d^2\log^2(f)} - \frac{x^2\log\left(1+f^{c+dx}\right)}{d\log(f)} + 2$$

Mathematica [A] time = 0.24, size = 123, normalized size = 0.85

$$\frac{-\frac{3d^2x^2\log^2(f)\left(f^{c+dx}+\left(f^{c+dx}+1\right)\log\left(f^{c+dx}+1\right)\right)}{f^{c+dx}+1} + 6\text{Li}_3\left(-f^{c+dx}\right) + (6-6dx\log(f))\text{Li}_2\left(-f^{c+dx}\right) + 6dx\log(f)\log\left(f^{c+dx} +\right.}{3d^3\log^3(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/(1 + 2*f^(c + d*x) + f^(2*c + 2*d*x)),x]
```

```
[Out] (d^3*x^3*Log[f]^3 + 6*d*x*Log[f]*Log[1 + f^(c + d*x)] - (3*d^2*x^2*Log[f]^2
*(f^(c + d*x) + (1 + f^(c + d*x))*Log[1 + f^(c + d*x)]))/(1 + f^(c + d*x))
+ (6 - 6*d*x*Log[f])*PolyLog[2, -f^(c + d*x)] + 6*PolyLog[3, -f^(c + d*x)])
/(3*d^3*Log[f]^3)
```

fricas [C] time = 0.43, size = 210, normalized size = 1.45

$$\frac{3\,c^2\log(f)^2+\left(d^3x^3+c^3\right)\log(f)^3+\left(\left(d^3x^3+c^3\right)\log(f)^3-3\left(d^2x^2-c^2\right)\log(f)^2\right)f^{dx+c}-6\left(dx\log(f)+\left(dx\log\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(1+2*f^(d*x+c)+f^(2*d*x+2*c)),x, algorithm="fricas")
```

```
[Out] 1/3*(3*c^2*log(f)^2 + (d^3*x^3 + c^3)*log(f)^3 + ((d^3*x^3 + c^3)*log(f)^3
- 3*(d^2*x^2 - c^2)*log(f)^2)*f^(d*x + c) - 6*(d*x*log(f) + (d*x*log(f) - 1
)*f^(d*x + c) - 1)*dilog(-f^(d*x + c)) - 3*(d^2*x^2*log(f)^2 - 2*d*x*log(f)
 + (d^2*x^2*log(f)^2 - 2*d*x*log(f))*f^(d*x + c))*log(f^(d*x + c) + 1) + 6*
(f^(d*x + c) + 1)*polylog(3, -f^(d*x + c)))/(d^3*f^(d*x + c)*log(f)^3 + d^3
*log(f)^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{f^{2\,dx+2\,c}+2\,f^{dx+c}+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(1+2*f^(d*x+c)+f^(2*d*x+2*c)),x, algorithm="giac")
```

```
[Out] integrate(x^2/(f^(2*d*x + 2*c) + 2*f^(d*x + c) + 1), x)
```

maple [A] time = 0.08, size = 232, normalized size = 1.60

$$\frac{x^3}{3}-\frac{c^2x}{d^2}-\frac{x^2\ln\left(f^c f^{dx}+1\right)}{d\ln(f)}-\frac{2c^3}{3d^3}+\frac{x^2}{\left(f^{dx+c}+1\right)d\ln(f)}-\frac{x^2}{d\ln(f)}+\frac{c^2\ln\left(f^c f^{dx}\right)}{d^3\ln(f)}-\frac{2cx}{d^2\ln(f)}-\frac{c^2}{d^3\ln(f)}-\frac{2x\,\mathrm{polylog}\left(\right.}{d^2\ln(}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(1+2*f^(d*x+c)+f^(2*d*x+2*c)),x)
```

```
[Out] x^2/d/(f^(d*x+c)+1)/ln(f)+1/3*x^3-c^2/d^2*x-2/3*c^3/d^3-1/d/ln(f)*ln(f^c*f^
(d*x)+1)*x^2-2/d^2/ln(f)^2*polylog(2,-f^c*f^(d*x))*x+2/d^3/ln(f)^3*polylog(
3,-f^c*f^(d*x))+1/d^3/ln(f)*c^2*ln(f^c*f^(d*x))-x^2/d/ln(f)-2/d^2/ln(f)*c*x
```

```
-1/d^3/ln(f)*c^2+2/d^2/ln(f)^2*ln(f^c*f^(d*x)+1)*x+2/d^3/ln(f)^3*polylog(2,
-f^c*f^(d*x))+2/d^3/ln(f)^2*c*ln(f^c*f^(d*x))
```

maxima [A] time = 1.06, size = 159, normalized size = 1.10

$$\frac{x^2}{df^{dx}f^c\log(f)+d\log(f)}+\frac{d^3x^3\log(f)^3-3\,d^2x^2\log(f)^2}{3\,d^3\log(f)^3}-\frac{d^2x^2\log\left(f^{dx}f^c+1\right)\log(f)^2+2\,dx\mathrm{Li}_2\left(-f^{dx}f^c\right)\log(f}{d^3\log(f)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(1+2*f^(d*x+c)+f^(2*d*x+2*c)),x, algorithm="maxima")
```

```
[Out] x^2/(d*f^(d*x)*f^c*log(f) + d*log(f)) + 1/3*(d^3*x^3*log(f)^3 - 3*d^2*x^2*l
og(f)^2)/(d^3*log(f)^3) - (d^2*x^2*log(f^(d*x)*f^c + 1)*log(f)^2 + 2*d*x*di
log(-f^(d*x)*f^c)*log(f) - 2*polylog(3, -f^(d*x)*f^c))/(d^3*log(f)^3) + 2*(
d*x*log(f^(d*x)*f^c + 1)*log(f) + dilog(-f^(d*x)*f^c))/(d^3*log(f)^3)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2}{f^{2\,c+2\,d\,x}+2\,f^{c+d\,x}+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(f^(2*c + 2*d*x) + 2*f^(c + d*x) + 1),x)
```

```
[Out] int(x^2/(f^(2*c + 2*d*x) + 2*f^(c + d*x) + 1), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{x^2}{df^{c+dx}\log(f)+d\log(f)}+\frac{\int\left(-\frac{2x}{e^{c\log(f)}e^{dx\log(f)}+1}\right)dx+\int\frac{dx^2\log(f)}{e^{c\log(f)}e^{dx\log(f)}+1}\,dx}{d\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(1+2*f**(d*x+c)+f**(2*d*x+2*c)),x)
```

```
[Out] x**2/(d*f**(c + d*x)*log(f) + d*log(f)) + (Integral(-2*x/(exp(c*log(f))*exp
(d*x*log(f)) + 1), x) + Integral(d*x**2*log(f)/(exp(c*log(f))*exp(d*x*log(f
)) + 1), x))/(d*log(f))
```

3.526 $\int \frac{x^2}{a+bf^{c+dx}+cf^{2c+2dx}}\,dx$

Optimal. Leaf size=484

$$\frac{4c\text{Li}_3\left(-\frac{2cf^{c+dx}}{b-\sqrt{b^2-4ac}}\right)}{d^3\log^3(f)\sqrt{b^2-4ac}\left(b-\sqrt{b^2-4ac}\right)}-\frac{4c\text{Li}_3\left(-\frac{2cf^{c+dx}}{b+\sqrt{b^2-4ac}}\right)}{d^3\log^3(f)\sqrt{b^2-4ac}\left(\sqrt{b^2-4ac}+b\right)}-\frac{4cx\text{Li}_2\left(-\frac{2cf^{c+dx}}{b-\sqrt{b^2-4ac}}\right)}{d^2\log^2(f)\sqrt{b^2-4ac}\left(b-\sqrt{b^2-\right.}}$$

```
[Out] -2*c*x^2*ln(1+2*c*f^(d*x+c)/(b-(-4*a*c+b^2)^(1/2)))/d/ln(f)/(b-(-4*a*c+b^2)
^(1/2))/(-4*a*c+b^2)^(1/2)-4*c*x*polylog(2,-2*c*f^(d*x+c)/(b-(-4*a*c+b^2)^(
1/2)))/d^2/ln(f)^2/(b-(-4*a*c+b^2)^(1/2))/(-4*a*c+b^2)^(1/2)+4*c*polylog(3,
-2*c*f^(d*x+c)/(b-(-4*a*c+b^2)^(1/2)))/d^3/ln(f)^3/(b-(-4*a*c+b^2)^(1/2))/(
-4*a*c+b^2)^(1/2)+2*c*x^2*ln(1+2*c*f^(d*x+c)/(b+(-4*a*c+b^2)^(1/2)))/d/ln(f
)/(-4*a*c+b^2)^(1/2)/(b+(-4*a*c+b^2)^(1/2))+4*c*x*polylog(2,-2*c*f^(d*x+c)/
(b+(-4*a*c+b^2)^(1/2)))/d^2/ln(f)^2/(-4*a*c+b^2)^(1/2)/(b+(-4*a*c+b^2)^(1/2
))-4*c*polylog(3,-2*c*f^(d*x+c)/(b+(-4*a*c+b^2)^(1/2)))/d^3/ln(f)^3/(-4*a*c
+b^2)^(1/2)/(b+(-4*a*c+b^2)^(1/2))-2/3*c*x^3/(b^2-4*a*c-b*(-4*a*c+b^2)^(1/2
))-2/3*c*x^3/(b^2-4*a*c+b*(-4*a*c+b^2)^(1/2))
```

Rubi [A] time = 0.87, antiderivative size = 484, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 6, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.207, Rules used = {2263, 2184, 2190, 2531, 2282, 6589}

$$-\frac{4cx\text{PolyLog}\left(2,-\frac{2cf^{c+dx}}{b-\sqrt{b^2-4ac}}\right)}{d^2\log^2(f)\sqrt{b^2-4ac}\left(b-\sqrt{b^2-4ac}\right)}+\frac{4cx\text{PolyLog}\left(2,-\frac{2cf^{c+dx}}{\sqrt{b^2-4ac}+b}\right)}{d^2\log^2(f)\sqrt{b^2-4ac}\left(\sqrt{b^2-4ac}+b\right)}+\frac{4c\text{PolyLog}\left(3,-\frac{2cf^{c+dx}}{b-\sqrt{b^2-4a}}\right.}{d^3\log^3(f)\sqrt{b^2-4ac}\left(b-\sqrt{b^2}\right.}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/(a + b*f^(c + d*x) + c*f^(2*c + 2*d*x)),x]
```

```
[Out] (-2*c*x^3)/(3*(b^2 - 4*a*c - b*Sqrt[b^2 - 4*a*c])) - (2*c*x^3)/(3*(b^2 - 4*
a*c + b*Sqrt[b^2 - 4*a*c])) - (2*c*x^2*Log[1 + (2*c*f^(c + d*x))/(b - Sqrt[
b^2 - 4*a*c])])/(Sqrt[b^2 - 4*a*c]*(b - Sqrt[b^2 - 4*a*c])*d*Log[f]) + (2*c
*x^2*Log[1 + (2*c*f^(c + d*x))/(b + Sqrt[b^2 - 4*a*c])])/(Sqrt[b^2 - 4*a*c]
*(b + Sqrt[b^2 - 4*a*c])*d*Log[f]) - (4*c*x*PolyLog[2, (-2*c*f^(c + d*x))/(
b - Sqrt[b^2 - 4*a*c])])/(Sqrt[b^2 - 4*a*c]*(b - Sqrt[b^2 - 4*a*c])*d^2*Log
[f]^2) + (4*c*x*PolyLog[2, (-2*c*f^(c + d*x))/(b + Sqrt[b^2 - 4*a*c])])/(Sq
rt[b^2 - 4*a*c]*(b + Sqrt[b^2 - 4*a*c])*d^2*Log[f]^2) + (4*c*PolyLog[3, (-2
*c*f^(c + d*x))/(b - Sqrt[b^2 - 4*a*c])])/(Sqrt[b^2 - 4*a*c]*(b - Sqrt[b^2
- 4*a*c])*d^3*Log[f]^3) - (4*c*PolyLog[3, (-2*c*f^(c + d*x))/(b + Sqrt[b^2
- 4*a*c])])/(Sqrt[b^2 - 4*a*c]*(b + Sqrt[b^2 - 4*a*c])*d^3*Log[f]^3)
```

Rule 2184

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[((c + d*x)^m*(F^(g*(e + f*x)))^n)/(a + b*(F^(g*(e + f*x)))^n), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2263

```
Int[((f_.) + (g_.)*(x_))^(m_.)/((a_.) + (b_.)*(F_)^(u_) + (c_.)*(F_)^(v_)),
 x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[(2*c)/q, Int[(f + g*x)^m/
(b - q + 2*c*F^u), x], x] - Dist[(2*c)/q, Int[(f + g*x)^m/(b + q + 2*c*F^u)
, x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v, 2*u] && LinearQ[u, x] &
& NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x^2}{a+bf^{c+dx}+cf^{2c+2dx}}\,dx = \frac{(2c)\int \frac{x^2}{b-\sqrt{b^2-4ac}+2cf^{c+dx}}\,dx}{\sqrt{b^2-4ac}} - \frac{(2c)\int \frac{x^2}{b+\sqrt{b^2-4ac}+2cf^{c+dx}}\,dx}{\sqrt{b^2-4ac}}$$

$$= -\frac{2cx^3}{3\left(b^2-4ac-b\sqrt{b^2-4ac}\right)} - \frac{2cx^3}{3\left(b^2-4ac+b\sqrt{b^2-4ac}\right)} + \frac{\left(4c^2\right)\int \frac{f^{c+dx}x^2}{b-\sqrt{b^2-4ac}+2c}}{b^2-4ac-b\sqrt{b^2-}}$$

$$= -\frac{2cx^3}{3\left(b^2-4ac-b\sqrt{b^2-4ac}\right)} - \frac{2cx^3}{3\left(b^2-4ac+b\sqrt{b^2-4ac}\right)} + \frac{2cx^2\log\left(1+\frac{}{b}\right.}{\left(b^2-4ac-b\sqrt{b^2-}\right.}$$

$$= -\frac{2cx^3}{3\left(b^2-4ac-b\sqrt{b^2-4ac}\right)} - \frac{2cx^3}{3\left(b^2-4ac+b\sqrt{b^2-4ac}\right)} + \frac{2cx^2\log\left(1+\frac{}{b}\right.}{\left(b^2-4ac-b\sqrt{b^2-}\right.}$$

$$= -\frac{2cx^3}{3\left(b^2-4ac-b\sqrt{b^2-4ac}\right)} - \frac{2cx^3}{3\left(b^2-4ac+b\sqrt{b^2-4ac}\right)} + \frac{2cx^2\log\left(1+\frac{}{b}\right.}{\left(b^2-4ac-b\sqrt{b^2-}\right.}$$

$$= -\frac{2cx^3}{3\left(b^2-4ac-b\sqrt{b^2-4ac}\right)} - \frac{2cx^3}{3\left(b^2-4ac+b\sqrt{b^2-4ac}\right)} + \frac{2cx^2\log\left(1+\frac{}{b}\right.}{\left(b^2-4ac-b\sqrt{b^2-}\right.}$$

Mathematica [F] time = 2.83, size = 0, normalized size = 0.00

$$\int \frac{x^2}{a+bf^{c+dx}+cf^{2c+2dx}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^2/(a + b*f^(c + d*x) + c*f^(2*c + 2*d*x)),x]
[Out] Integrate[x^2/(a + b*f^(c + d*x) + c*f^(2*c + 2*d*x)), x]
```

fricas [C] time = 0.44, size = 694, normalized size = 1.43

$$2\left(b^2-4\,ac\right)d^3x^3\log(f)^3 - 6\left(abdx\sqrt{\frac{b^2-4\,ac}{a^2}}\,\log(f) + \left(b^2-4\,ac\right)dx\log(f)\right)\mathrm{Li}_2\left(-\frac{\left(a\sqrt{\frac{b^2-4\,ac}{a^2}}+b\right)f^{dx+c}+2\,a}{2\,a}+1\right)+6\left(\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a+b*f^(d*x+c)+c*f^(2*d*x+2*c)),x, algorithm="fricas")
```

```
[Out] 1/6*(2*(b^2 - 4*a*c)*d^3*x^3*log(f)^3 - 6*(a*b*d*x*sqrt((b^2 - 4*a*c)/a^2)*
log(f) + (b^2 - 4*a*c)*d*x*log(f))*dilog(-1/2*((a*sqrt((b^2 - 4*a*c)/a^2) +
 b)*f^(d*x + c) + 2*a)/a + 1) + 6*(a*b*d*x*sqrt((b^2 - 4*a*c)/a^2)*log(f) -
 (b^2 - 4*a*c)*d*x*log(f))*dilog(1/2*((a*sqrt((b^2 - 4*a*c)/a^2) - b)*f^(d*
x + c) - 2*a)/a + 1) + 3*(a*b*c^2*sqrt((b^2 - 4*a*c)/a^2)*log(f)^2 - (b^2*c
^2 - 4*a*c^3)*log(f)^2)*log(2*c*f^(d*x + c) + a*sqrt((b^2 - 4*a*c)/a^2) + b
) - 3*(a*b*c^2*sqrt((b^2 - 4*a*c)/a^2)*log(f)^2 + (b^2*c^2 - 4*a*c^3)*log(f
)^2)*log(2*c*f^(d*x + c) - a*sqrt((b^2 - 4*a*c)/a^2) + b) - 3*((a*b*d^2*x^2
 - a*b*c^2)*sqrt((b^2 - 4*a*c)/a^2)*log(f)^2 + ((b^2 - 4*a*c)*d^2*x^2 - b^2
*c^2 + 4*a*c^3)*log(f)^2)*log(1/2*((a*sqrt((b^2 - 4*a*c)/a^2) + b)*f^(d*x +
 c) + 2*a)/a) + 3*((a*b*d^2*x^2 - a*b*c^2)*sqrt((b^2 - 4*a*c)/a^2)*log(f)^2
 - ((b^2 - 4*a*c)*d^2*x^2 - b^2*c^2 + 4*a*c^3)*log(f)^2)*log(-1/2*((a*sqrt(
(b^2 - 4*a*c)/a^2) - b)*f^(d*x + c) - 2*a)/a) + 6*(a*b*sqrt((b^2 - 4*a*c)/a
^2) + b^2 - 4*a*c)*polylog(3, -1/2*(a*sqrt((b^2 - 4*a*c)/a^2) + b)*f^(d*x +
 c)/a) - 6*(a*b*sqrt((b^2 - 4*a*c)/a^2) - b^2 + 4*a*c)*polylog(3, 1/2*(a*sq
rt((b^2 - 4*a*c)/a^2) - b)*f^(d*x + c)/a))/((a*b^2 - 4*a^2*c)*d^3*log(f)^3)
```

giac **[F]** time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{cf^{2\,dx+2\,c} + bf^{dx+c} + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a+b*f^(d*x+c)+c*f^(2*d*x+2*c)),x, algorithm="giac")
```

```
[Out] integrate(x^2/(c*f^(2*d*x + 2*c) + b*f^(d*x + c) + a), x)
```

maple **[F]** time = 0.16, size = 0, normalized size = 0.00

$$\int \frac{x^2}{b\,f^{dx+c} + c\,f^{2dx+2c} + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(a+b*f^(d*x+c)+c*f^(2*d*x+2*c)),x)
```

```
[Out] int(x^2/(a+b*f^(d*x+c)+c*f^(2*d*x+2*c)),x)
```

maxima **[F(-2)]** time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a+b*f^(d*x+c)+c*f^(2*d*x+2*c)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*a*c-b^2>0)', see `assume?` for mo
re details)Is 4*a*c-b^2 positive or negative?
```

mupad **[F]** time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2}{a + b\, f^{c+d\,x} + c\, f^{2\,c+2\,d\,x}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(a + b*f^(c + d*x) + c*f^(2*c + 2*d*x)),x)
```

```
[Out] int(x^2/(a + b*f^(c + d*x) + c*f^(2*c + 2*d*x)), x)
```

sympy **[F]** time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{a + bf^c f^{dx} + cf^{2c} f^{2dx}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(a+b*f**(d*x+c)+c*f**(2*d*x+2*c)),x)
```

```
[Out] Integral(x**2/(a + b*f**c*f**(d*x) + c*f**(2*c)*f**(2*d*x)), x)
```

3.527 $\int \frac{d+ef^{g+hx}}{a+bf^{g+hx}+cf^{2g+2hx}}\,dx$

Optimal. Leaf size=103

$$\frac{(bd-2ae)\tanh^{-1}\left(\frac{b+2cf^{g+hx}}{\sqrt{b^2-4ac}}\right)}{ah\log(f)\sqrt{b^2-4ac}}-\frac{d\log\left(a+bf^{g+hx}+cf^{2g+2hx}\right)}{2ah\log(f)}+\frac{dx}{a}$$

```
[Out] d*x/a-1/2*d*ln(a+b*f^(h*x+g)+c*f^(2*h*x+2*g))/a/h/ln(f)+(-2*a*e+b*d)*arctan
h((b+2*c*f^(h*x+g))/(-4*a*c+b^2)^(1/2))/a/h/ln(f)/(-4*a*c+b^2)^(1/2)
```

Rubi [A] time = 0.16, antiderivative size = 103, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.162, Rules used = {2282, 800, 634, 618, 206, 628}

$$\frac{(bd-2ae)\tanh^{-1}\left(\frac{b+2cf^{g+hx}}{\sqrt{b^2-4ac}}\right)}{ah\log(f)\sqrt{b^2-4ac}}-\frac{d\log\left(a+bf^{g+hx}+cf^{2g+2hx}\right)}{2ah\log(f)}+\frac{dx}{a}$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*f^(g + h*x))/(a + b*f^(g + h*x) + c*f^(2*g + 2*h*x)),x]
```

```
[Out] (d*x)/a + ((b*d - 2*a*e)*ArcTanh[(b + 2*c*f^(g + h*x))/Sqrt[b^2 - 4*a*c]])/
(a*Sqrt[b^2 - 4*a*c]*h*Log[f]) - (d*Log[a + b*f^(g + h*x) + c*f^(2*g + 2*h*
x)])/(2*a*h*Log[f])
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 618

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> Dist[-2, Subst[I
nt[1/Simp[b^2 - 4*a*c - x^2, x], x], x, b + 2*c*x], x] /; FreeQ[{a, b, c},
x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 634

```
Int[((d_.) + (e_.)*(x_))/((a_) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> D
ist[(2*c*d - b*e)/(2*c), Int[1/(a + b*x + c*x^2), x], x] + Dist[e/(2*c), In
t[(b + 2*c*x)/(a + b*x + c*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && NeQ
[2*c*d - b*e, 0] && NeQ[b^2 - 4*a*c, 0] &&  !NiceSqrtQ[b^2 - 4*a*c]
```

Rule 800

```
Int[(((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_)))/((a_.) + (b_.)*(x_) +
(c_.)*(x_)^2), x_Symbol] :> Int[ExpandIntegrand[((d + e*x)^m*(f + g*x))/(a
+ b*x + c*x^2), x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[b^2 - 4*a*
c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegerQ[m]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\int \frac{d+ef^{g+hx}}{a+bf^{g+hx}+cf^{2g+2hx}}\,dx = \frac{\text{Subst}\left(\int \frac{d+ex}{x(a+bx+cx^2)}\,dx, x, f^{g+hx}\right)}{h\log(f)}$$

$$= \frac{\text{Subst}\left(\int \left(\frac{d}{ax}+\frac{-bd+ae-cdx}{a(a+bx+cx^2)}\right)dx, x, f^{g+hx}\right)}{h\log(f)}$$

$$= \frac{dx}{a}+\frac{\text{Subst}\left(\int \frac{-bd+ae-cdx}{a+bx+cx^2}\,dx, x, f^{g+hx}\right)}{ah\log(f)}$$

$$= \frac{dx}{a}-\frac{d\,\text{Subst}\left(\int \frac{b+2cx}{a+bx+cx^2}\,dx, x, f^{g+hx}\right)}{2ah\log(f)}-\frac{(bd-2ae)\,\text{Subst}\left(\int \frac{1}{a+bx+cx^2}\,dx, x, f^{g+hx}\right)}{2ah\log(f)}$$

$$= \frac{dx}{a}-\frac{d\log\left(a+bf^{g+hx}+cf^{2g+2hx}\right)}{2ah\log(f)}+\frac{(bd-2ae)\,\text{Subst}\left(\int \frac{1}{b^2-4ac-x^2}\,dx, x, b+2cf^{g}\ldots\right)}{ah\log(f)}$$

$$= \frac{dx}{a}+\frac{(bd-2ae)\tanh^{-1}\left(\frac{b+2cf^{g+hx}}{\sqrt{b^2-4ac}}\right)}{a\sqrt{b^2-4ac}\,h\log(f)}-\frac{d\log\left(a+bf^{g+hx}+cf^{2g+2hx}\right)}{2ah\log(f)}$$

Mathematica [A] time = 0.16, size = 102, normalized size = 0.99

$$-\frac{\frac{2(bd-2ae)\tan^{-1}\left(\frac{b+2cf^{g+hx}}{\sqrt{4ac-b^2}}\right)}{h\log(f)\sqrt{4ac-b^2}}+\frac{d\log\left(a+f^{g+hx}\left(b+cf^{g+hx}\right)\right)}{h\log(f)}-2dx}{2a}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*f^(g + h*x))/(a + b*f^(g + h*x) + c*f^(2*g + 2*h*x)),x]
```

```
[Out] -1/2*(-2*d*x + (2*(b*d - 2*a*e)*ArcTan[(b + 2*c*f^(g + h*x))/Sqrt[-b^2 + 4*
a*c]])/(Sqrt[-b^2 + 4*a*c]*h*Log[f]) + (d*Log[a + f^(g + h*x)*(b + c*f^(g +
 h*x))])/(h*Log[f]))/a
```

fricas [A] time = 0.46, size = 330, normalized size = 3.20

$$\left[\frac{2\left(b^2-4ac\right)dhx\log(f)-\left(b^2-4ac\right)d\log\left(cf^{2hx+2g}+bf^{hx+g}+a\right)-\sqrt{b^2-4ac}\,(bd-2ae)\log\left(\frac{2c^2f^{2hx+2g}+b^2-2ac\ldots}{cf\ldots}\right.}{2\left(ab^2-4a^2c\right)h\log(f)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*f^(h*x+g))/(a+b*f^(h*x+g)+c*f^(2*h*x+2*g)),x, algorithm="fri
cas")
```

```
[Out] [1/2*(2*(b^2 - 4*a*c)*d*h*x*log(f) - (b^2 - 4*a*c)*d*log(c*f^(2*h*x + 2*g)
+ b*f^(h*x + g) + a) - sqrt(b^2 - 4*a*c)*(b*d - 2*a*e)*log((2*c^2*f^(2*h*x
+ 2*g) + b^2 - 2*a*c + 2*(b*c - sqrt(b^2 - 4*a*c)*c)*f^(h*x + g) - sqrt(b^2
 - 4*a*c)*b)/(c*f^(2*h*x + 2*g) + b*f^(h*x + g) + a)))/((a*b^2 - 4*a^2*c)*h
*log(f)), 1/2*(2*(b^2 - 4*a*c)*d*h*x*log(f) - (b^2 - 4*a*c)*d*log(c*f^(2*h*
x + 2*g) + b*f^(h*x + g) + a) + 2*sqrt(-b^2 + 4*a*c)*(b*d - 2*a*e)*arctan(-
(2*sqrt(-b^2 + 4*a*c)*c*f^(h*x + g) + sqrt(-b^2 + 4*a*c)*b)/(b^2 - 4*a*c)))
/((a*b^2 - 4*a^2*c)*h*log(f))]
```

giac [A] time = 0.44, size = 124, normalized size = 1.20

$$-\frac{d\log\left(cf^{2\,hx}f^{2\,g}+bf^{hx}f^{g}+a\right)}{2\,ah\log(f)}+\frac{d\log\left(\left|f\right|^{hx}\left|f\right|^{g}\right)}{ah\log(f)}-\frac{(bd-2\,ae)\arctan\left(\frac{2\,cf^{hx}f^{g}+b}{\sqrt{-b^{2}+4\,ac}}\right)}{\sqrt{-b^{2}+4\,ac}\,ah\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*f^(h*x+g))/(a+b*f^(h*x+g)+c*f^(2*h*x+2*g)),x, algorithm="gia
c")
```

```
[Out] -1/2*d*log(c*f^(2*h*x)*f^(2*g) + b*f^(h*x)*f^g + a)/(a*h*log(f)) + d*log(ab
s(f)^(h*x)*abs(f)^g)/(a*h*log(f)) - (b*d - 2*a*e)*arctan((2*c*f^(h*x)*f^g +
 b)/sqrt(-b^2 + 4*a*c))/(sqrt(-b^2 + 4*a*c)*a*h*log(f))
```

maple [B] time = 0.17, size = 993, normalized size = 9.64

$$\frac{4acd\,h^{2}x\ln(f)^{2}}{4a^{2}c\,h^{2}\ln(f)^{2}-a\,b^{2}h^{2}\ln(f)^{2}}-\frac{b^{2}d\,h^{2}x\ln(f)^{2}}{4a^{2}c\,h^{2}\ln(f)^{2}-a\,b^{2}h^{2}\ln(f)^{2}}+\frac{4acdgh\ln(f)^{2}}{4a^{2}c\,h^{2}\ln(f)^{2}-a\,b^{2}h^{2}\ln(f)^{2}}-\frac{b^{2}dgh\ln(}{4a^{2}c\,h^{2}\ln(f)^{2}-a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*f^(h*x+g))/(a+b*f^(h*x+g)+c*f^(2*h*x+2*g)),x)
```

```
[Out] 4/(4*a^2*c*h^2*ln(f)^2-a*b^2*h^2*ln(f)^2)*ln(f)^2*a*c*d*h^2*x-1/(4*a^2*c*h^
2*ln(f)^2-a*b^2*h^2*ln(f)^2)*ln(f)^2*b^2*d*h^2*x+4/(4*a^2*c*h^2*ln(f)^2-a*b
^2*h^2*ln(f)^2)*ln(f)^2*a*c*d*g*h-1/(4*a^2*c*h^2*ln(f)^2-a*b^2*h^2*ln(f)^2)
*ln(f)^2*b^2*d*g*h-2/(4*a*c-b^2)/h/ln(f)*ln(f^(h*x+g)+1/2*(2*a*b*e-b^2*d+(-
16*a^3*c*e^2+4*a^2*b^2*e^2+16*a^2*b*c*d*e-4*a*b^3*d*e-4*a*b^2*c*d^2+b^4*d^2
)^(1/2))/c/(2*a*e-b*d))*c*d+1/2/a/(4*a*c-b^2)/h/ln(f)*ln(f^(h*x+g)+1/2*(2*a
*b*e-b^2*d+(-16*a^3*c*e^2+4*a^2*b^2*e^2+16*a^2*b*c*d*e-4*a*b^3*d*e-4*a*b^2*
```

```
c*d^2+b^4*d^2)^(1/2))/c/(2*a*e-b*d))*b^2*d+1/2/a/(4*a*c-b^2)/h/ln(f)*ln(f^(
h*x+g)+1/2*(2*a*b*e-b^2*d+(-16*a^3*c*e^2+4*a^2*b^2*e^2+16*a^2*b*c*d*e-4*a*b
^3*d*e-4*a*b^2*c*d^2+b^4*d^2)^(1/2))/c/(2*a*e-b*d))*(-16*a^3*c*e^2+4*a^2*b^
2*e^2+16*a^2*b*c*d*e-4*a*b^3*d*e-4*a*b^2*c*d^2+b^4*d^2)^(1/2)-2/(4*a*c-b^2)
/h/ln(f)*ln(f^(h*x+g)-1/2*(-2*a*b*e+b^2*d+(-16*a^3*c*e^2+4*a^2*b^2*e^2+16*a
^2*b*c*d*e-4*a*b^3*d*e-4*a*b^2*c*d^2+b^4*d^2)^(1/2))/c/(2*a*e-b*d))*c*d+1/2
/a/(4*a*c-b^2)/h/ln(f)*ln(f^(h*x+g)-1/2*(-2*a*b*e+b^2*d+(-16*a^3*c*e^2+4*a^
2*b^2*e^2+16*a^2*b*c*d*e-4*a*b^3*d*e-4*a*b^2*c*d^2+b^4*d^2)^(1/2))/c/(2*a*e
-b*d))*b^2*d-1/2/a/(4*a*c-b^2)/h/ln(f)*ln(f^(h*x+g)-1/2*(-2*a*b*e+b^2*d+(-1
6*a^3*c*e^2+4*a^2*b^2*e^2+16*a^2*b*c*d*e-4*a*b^3*d*e-4*a*b^2*c*d^2+b^4*d^2)
^(1/2))/c/(2*a*e-b*d))*(-16*a^3*c*e^2+4*a^2*b^2*e^2+16*a^2*b*c*d*e-4*a*b^3*
d*e-4*a*b^2*c*d^2+b^4*d^2)^(1/2)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*f^(h*x+g))/(a+b*f^(h*x+g)+c*f^(2*h*x+2*g)),x, algorithm="max
ima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*a*c-b^2>0)', see `assume?` for mo
re details)Is 4*a*c-b^2 positive or negative?
```

mupad [B] time = 3.81, size = 105, normalized size = 1.02

$$\frac{d\,x}{a}-\frac{d\,\ln\left(a+c\,f^{2\,h\,x}\,f^{2\,g}+b\,f^{h\,x}\,f^{g}\right)}{2\,a\,h\,\ln(f)}+\frac{\mathrm{atan}\left(\frac{b+2\,c\,f^{h\,x}\,f^{g}}{\sqrt{4\,a\,c-b^2}}\right)\,(2\,a\,e-b\,d)}{a\,h\,\ln(f)\,\sqrt{4\,a\,c-b^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d + e*f^(g + h*x))/(a + b*f^(g + h*x) + c*f^(2*g + 2*h*x)),x)
```

```
[Out] (d*x)/a - (d*log(a + c*f^(2*h*x)*f^(2*g) + b*f^(h*x)*f^g))/(2*a*h*log(f)) +
 (atan((b + 2*c*f^(h*x)*f^g)/(4*a*c - b^2)^(1/2))*(2*a*e - b*d))/(a*h*log(f
)*(4*a*c - b^2)^(1/2))
```

sympy [A] time = 1.20, size = 139, normalized size = 1.35

$$\operatorname{RootSum}\left(z^2\left(4a^2ch^2\log(f)^2-ab^2h^2\log(f)^2\right)+z\left(4acdh\log(f)-b^2dh\log(f)\right)+ae^2-bde+cd^2,\left(i\mapsto i\log\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*f**(h*x+g))/(a+b*f**(h*x+g)+c*f**(2*h*x+2*g)),x)
```

```
[Out] RootSum(_z**2*(4*a**2*c*h**2*log(f)**2 - a*b**2*h**2*log(f)**2) + _z*(4*a*c
*d*h*log(f) - b**2*d*h*log(f)) + a*e**2 - b*d*e + c*d**2, Lambda(_i, _i*log
(f**(g + h*x) + (4*_i*a**2*c*h*log(f) - _i*a*b**2*h*log(f) + a*b*e + 2*a*c*
d - b**2*d)/(2*a*c*e - b*c*d)))) + d*x/a
```

3.528 $\int \frac{d+ef^{g+hx}}{a+bf^{g+hx}+cf^{2(g+hx)}}\,dx$

Optimal. Leaf size=103

$$\frac{(bd-2ae)\tanh^{-1}\left(\frac{b+2cf^{g+hx}}{\sqrt{b^2-4ac}}\right)}{ah\log(f)\sqrt{b^2-4ac}}-\frac{d\log\left(a+bf^{g+hx}+cf^{2g+2hx}\right)}{2ah\log(f)}+\frac{dx}{a}$$

```
[Out] d*x/a-1/2*d*ln(a+b*f^(h*x+g)+c*f^(2*h*x+2*g))/a/h/ln(f)+(-2*a*e+b*d)*arctan
h((b+2*c*f^(h*x+g))/(-4*a*c+b^2)^(1/2))/a/h/ln(f)/(-4*a*c+b^2)^(1/2)
```

Rubi [A] time = 0.14, antiderivative size = 103, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, integrand size = 36, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {2282, 800, 634, 618, 206, 628}

$$\frac{(bd-2ae)\tanh^{-1}\left(\frac{b+2cf^{g+hx}}{\sqrt{b^2-4ac}}\right)}{ah\log(f)\sqrt{b^2-4ac}}-\frac{d\log\left(a+bf^{g+hx}+cf^{2g+2hx}\right)}{2ah\log(f)}+\frac{dx}{a}$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*f^(g + h*x))/(a + b*f^(g + h*x) + c*f^(2*(g + h*x))),x]
```

```
[Out] (d*x)/a + ((b*d - 2*a*e)*ArcTanh[(b + 2*c*f^(g + h*x))/Sqrt[b^2 - 4*a*c]])/
(a*Sqrt[b^2 - 4*a*c]*h*Log[f]) - (d*Log[a + b*f^(g + h*x) + c*f^(2*g + 2*h*
x)])/(2*a*h*Log[f])
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 618

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> Dist[-2, Subst[I
nt[1/Simp[b^2 - 4*a*c - x^2, x], x], x, b + 2*c*x], x] /; FreeQ[{a, b, c},
x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 634

```
Int[((d_.) + (e_.)*(x_))/((a_) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> D
ist[(2*c*d - b*e)/(2*c), Int[1/(a + b*x + c*x^2), x], x] + Dist[e/(2*c), In
t[(b + 2*c*x)/(a + b*x + c*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && NeQ
[2*c*d - b*e, 0] && NeQ[b^2 - 4*a*c, 0] &&  !NiceSqrtQ[b^2 - 4*a*c]
```

Rule 800

```
Int[(((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_)))/((a_.) + (b_.)*(x_) +
(c_.)*(x_)^2), x_Symbol] :> Int[ExpandIntegrand[((d + e*x)^m*(f + g*x))/(a
+ b*x + c*x^2), x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[b^2 - 4*a*
c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegerQ[m]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\int \frac{d+ef^{g+hx}}{a+bf^{g+hx}+cf^{2(g+hx)}}\,dx = \frac{\text{Subst}\left(\int \frac{d+ex}{x(a+bx+cx^2)}\,dx, x, f^{g+hx}\right)}{h\log(f)}$$

$$= \frac{\text{Subst}\left(\int \left(\frac{d}{ax}+\frac{-bd+ae-cdx}{a(a+bx+cx^2)}\right)dx, x, f^{g+hx}\right)}{h\log(f)}$$

$$= \frac{dx}{a}+\frac{\text{Subst}\left(\int \frac{-bd+ae-cdx}{a+bx+cx^2}\,dx, x, f^{g+hx}\right)}{ah\log(f)}$$

$$= \frac{dx}{a}-\frac{d\,\text{Subst}\left(\int \frac{b+2cx}{a+bx+cx^2}\,dx, x, f^{g+hx}\right)}{2ah\log(f)}-\frac{(bd-2ae)\,\text{Subst}\left(\int \frac{1}{a+bx+cx^2}\,dx, x, f^{g+hx}\right)}{2ah\log(f)}$$

$$= \frac{dx}{a}-\frac{d\log\left(a+bf^{g+hx}+cf^{2g+2hx}\right)}{2ah\log(f)}+\frac{(bd-2ae)\,\text{Subst}\left(\int \frac{1}{b^2-4ac-x^2}\,dx, x, b+2cf^{g+hx}\right)}{ah\log(f)}$$

$$= \frac{dx}{a}+\frac{(bd-2ae)\tanh^{-1}\left(\frac{b+2cf^{g+hx}}{\sqrt{b^2-4ac}}\right)}{a\sqrt{b^2-4ac}\,h\log(f)}-\frac{d\log\left(a+bf^{g+hx}+cf^{2g+2hx}\right)}{2ah\log(f)}$$

Mathematica [A] time = 0.03, size = 102, normalized size = 0.99

$$-\frac{\frac{2(bd-2ae)\tan^{-1}\left(\frac{b+2cf^{g+hx}}{\sqrt{4ac-b^2}}\right)}{h\log(f)\sqrt{4ac-b^2}}+\frac{d\log\left(a+f^{g+hx}\left(b+cf^{g+hx}\right)\right)}{h\log(f)}-2dx}{2a}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*f^(g + h*x))/(a + b*f^(g + h*x) + c*f^(2*(g + h*x))),x]
```

```
[Out] -1/2*(-2*d*x + (2*(b*d - 2*a*e)*ArcTan[(b + 2*c*f^(g + h*x))/Sqrt[-b^2 + 4*
a*c]])/(Sqrt[-b^2 + 4*a*c]*h*Log[f]) + (d*Log[a + f^(g + h*x)*(b + c*f^(g +
 h*x))])/(h*Log[f]))/a
```

fricas [A] time = 0.46, size = 330, normalized size = 3.20

$$\left[\frac{2\left(b^2-4ac\right)dhx\log(f)-\left(b^2-4ac\right)d\log\left(cf^{2hx+2g}+bf^{hx+g}+a\right)-\sqrt{b^2-4ac}\,(bd-2ae)\log\left(\frac{2c^2f^{2hx+2g}+b^2-2ac\cdots}{cf\cdots}\right.}{2\left(ab^2-4a^2c\right)h\log(f)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*f^(h*x+g))/(a+b*f^(h*x+g)+c*f^(2*h*x+2*g)),x, algorithm="fri
cas")
```

```
[Out] [1/2*(2*(b^2 - 4*a*c)*d*h*x*log(f) - (b^2 - 4*a*c)*d*log(c*f^(2*h*x + 2*g)
+ b*f^(h*x + g) + a) - sqrt(b^2 - 4*a*c)*(b*d - 2*a*e)*log((2*c^2*f^(2*h*x
+ 2*g) + b^2 - 2*a*c + 2*(b*c - sqrt(b^2 - 4*a*c)*c)*f^(h*x + g) - sqrt(b^2
 - 4*a*c)*b)/(c*f^(2*h*x + 2*g) + b*f^(h*x + g) + a)))/((a*b^2 - 4*a^2*c)*h
*log(f)), 1/2*(2*(b^2 - 4*a*c)*d*h*x*log(f) - (b^2 - 4*a*c)*d*log(c*f^(2*h*
x + 2*g) + b*f^(h*x + g) + a) + 2*sqrt(-b^2 + 4*a*c)*(b*d - 2*a*e)*arctan(-
(2*sqrt(-b^2 + 4*a*c)*c*f^(h*x + g) + sqrt(-b^2 + 4*a*c)*b)/(b^2 - 4*a*c)))
/((a*b^2 - 4*a^2*c)*h*log(f))]
```

giac [A] time = 0.49, size = 124, normalized size = 1.20

$$-\frac{d\log\left(cf^{2\,hx}f^{2\,g}+bf^{hx}f^{g}+a\right)}{2\,ah\log\left(f\right)}+\frac{d\log\left(\left|f\right|^{hx}\left|f\right|^{g}\right)}{ah\log\left(f\right)}-\frac{(bd-2\,ae)\arctan\left(\frac{2\,cf^{hx}f^{g}+b}{\sqrt{-b^{2}+4\,ac}}\right)}{\sqrt{-b^{2}+4\,ac}\,ah\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*f^(h*x+g))/(a+b*f^(h*x+g)+c*f^(2*h*x+2*g)),x, algorithm="gia
c")
```

```
[Out] -1/2*d*log(c*f^(2*h*x)*f^(2*g) + b*f^(h*x)*f^g + a)/(a*h*log(f)) + d*log(ab
s(f)^(h*x)*abs(f)^g)/(a*h*log(f)) - (b*d - 2*a*e)*arctan((2*c*f^(h*x)*f^g +
 b)/sqrt(-b^2 + 4*a*c))/(sqrt(-b^2 + 4*a*c)*a*h*log(f))
```

maple [B] time = 0.03, size = 993, normalized size = 9.64

$$\frac{4acd\,h^{2}x\ln(f)^{2}}{4a^{2}c\,h^{2}\ln(f)^{2}-a\,b^{2}h^{2}\ln(f)^{2}}-\frac{b^{2}d\,h^{2}x\ln(f)^{2}}{4a^{2}c\,h^{2}\ln(f)^{2}-a\,b^{2}h^{2}\ln(f)^{2}}+\frac{4acdgh\ln(f)^{2}}{4a^{2}c\,h^{2}\ln(f)^{2}-a\,b^{2}h^{2}\ln(f)^{2}}-\frac{b^{2}dgh\ln(}{4a^{2}c\,h^{2}\ln(f)^{2}-a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*f^(h*x+g))/(a+b*f^(h*x+g)+c*f^(2*h*x+2*g)),x)
```

```
[Out] 4/(4*a^2*c*h^2*ln(f)^2-a*b^2*h^2*ln(f)^2)*a*c*d*h^2*x*ln(f)^2-1/(4*a^2*c*h^
2*ln(f)^2-a*b^2*h^2*ln(f)^2)*b^2*d*h^2*x*ln(f)^2+4/(4*a^2*c*h^2*ln(f)^2-a*b
^2*h^2*ln(f)^2)*a*c*d*g*h*ln(f)^2-1/(4*a^2*c*h^2*ln(f)^2-a*b^2*h^2*ln(f)^2)
*b^2*d*g*h*ln(f)^2+1/2/(4*a*c-b^2)/a*b^2*d/h/ln(f)*ln(f^(h*x+g)-1/2*(-2*a*b
*e+b^2*d+(-16*a^3*c*e^2+4*a^2*b^2*e^2+16*a^2*b*c*d*e-4*a*b^3*d*e-4*a*b^2*c*
d^2+b^4*d^2)^(1/2))/(2*a*e-b*d)/c)+1/2/(4*a*c-b^2)/a*b^2*d/h/ln(f)*ln(f^(h*
x+g)+1/2*(2*a*b*e-b^2*d+(-16*a^3*c*e^2+4*a^2*b^2*e^2+16*a^2*b*c*d*e-4*a*b^3
```

```
*d*e-4*a*b^2*c*d^2+b^4*d^2)^(1/2))/(2*a*e-b*d)/c)-2/(4*a*c-b^2)*c*d/h/ln(f)
*ln(f^(h*x+g)-1/2*(-2*a*b*e+b^2*d+(-16*a^3*c*e^2+4*a^2*b^2*e^2+16*a^2*b*c*d
*e-4*a*b^3*d*e-4*a*b^2*c*d^2+b^4*d^2)^(1/2))/(2*a*e-b*d)/c)-2/(4*a*c-b^2)*c
*d/h/ln(f)*ln(f^(h*x+g)+1/2*(2*a*b*e-b^2*d+(-16*a^3*c*e^2+4*a^2*b^2*e^2+16*
a^2*b*c*d*e-4*a*b^3*d*e-4*a*b^2*c*d^2+b^4*d^2)^(1/2))/(2*a*e-b*d)/c)-1/2/(4
*a*c-b^2)*(-16*a^3*c*e^2+4*a^2*b^2*e^2+16*a^2*b*c*d*e-4*a*b^3*d*e-4*a*b^2*c
*d^2+b^4*d^2)^(1/2)/a/h/ln(f)*ln(f^(h*x+g)-1/2*(-2*a*b*e+b^2*d+(-16*a^3*c*e
^2+4*a^2*b^2*e^2+16*a^2*b*c*d*e-4*a*b^3*d*e-4*a*b^2*c*d^2+b^4*d^2)^(1/2))/(
2*a*e-b*d)/c)+1/2/(4*a*c-b^2)*(-16*a^3*c*e^2+4*a^2*b^2*e^2+16*a^2*b*c*d*e-4
*a*b^3*d*e-4*a*b^2*c*d^2+b^4*d^2)^(1/2)/a/h/ln(f)*ln(f^(h*x+g)+1/2*(2*a*b*e
-b^2*d+(-16*a^3*c*e^2+4*a^2*b^2*e^2+16*a^2*b*c*d*e-4*a*b^3*d*e-4*a*b^2*c*d^
2+b^4*d^2)^(1/2))/(2*a*e-b*d)/c)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*f^(h*x+g))/(a+b*f^(h*x+g)+c*f^(2*h*x+2*g)),x, algorithm="max
ima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*a*c-b^2>0)', see `assume?` for mo
re details)Is 4*a*c-b^2 positive or negative?
```

mupad [B] time = 0.00, size = 105, normalized size = 1.02

$$\frac{d\,x}{a}-\frac{d\,\ln\left(a+c\,f^{2\,h\,x}\,f^{2\,g}+b\,f^{h\,x}\,f^g\right)}{2\,a\,h\,\ln(f)}+\frac{\mathrm{atan}\left(\frac{b+2\,c\,f^{h\,x}\,f^g}{\sqrt{4\,a\,c-b^2}}\right)\,(2\,a\,e-b\,d)}{a\,h\,\ln(f)\,\sqrt{4\,a\,c-b^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d + e*f^(g + h*x))/(a + b*f^(g + h*x) + c*f^(2*g + 2*h*x)),x)
```

```
[Out] (d*x)/a - (d*log(a + c*f^(2*h*x)*f^(2*g) + b*f^(h*x)*f^g))/(2*a*h*log(f)) +
 (atan((b + 2*c*f^(h*x)*f^g)/(4*a*c - b^2)^(1/2))*(2*a*e - b*d))/(a*h*log(f
)*(4*a*c - b^2)^(1/2))
```

sympy [A] time = 1.21, size = 139, normalized size = 1.35

$$\operatorname{RootSum}\left(z^2\left(4a^2ch^2\log(f)^2-ab^2h^2\log(f)^2\right)+z\left(4acdh\log(f)-b^2dh\log(f)\right)+ae^2-bde+cd^2,\left(i\mapsto i\log\left(\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*f**(h*x+g))/(a+b*f**(h*x+g)+c*f**(2*h*x+2*g)),x)
```

```
[Out] RootSum(_z**2*(4*a**2*c*h**2*log(f)**2 - a*b**2*h**2*log(f)**2) + _z*(4*a*c
*d*h*log(f) - b**2*d*h*log(f)) + a*e**2 - b*d*e + c*d**2, Lambda(_i, _i*log
(f**(g + h*x) + (4*_i*a**2*c*h*log(f) - _i*a*b**2*h*log(f) + a*b*e + 2*a*c*
d - b**2*d)/(2*a*c*e - b*c*d)))) + d*x/a
```

3.529 $\int \frac{1}{2+e^{-x}+e^x} \, dx$

Optimal. Leaf size=9

$$-\frac{1}{e^x+1}$$

```
[Out] -1/(1+exp(x))
```

Rubi [A] time = 0.01, antiderivative size = 9, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {2282, 32}

$$-\frac{1}{e^x+1}$$

Antiderivative was successfully verified.

```
[In] Int[(2 + E^(-x) + E^x)^(-1),x]
```

```
[Out] -(1 + E^x)^(-1)
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m + 1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x], Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; FunctionOfExponentialQ[u, x] && !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[{a, m, n}, x] && IntegerQ[m*n]] && !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned} \int \frac{1}{2+e^{-x}+e^x} \, dx &= \text{Subst}\left(\int \frac{1}{(1+x)^2} \, dx, x, e^x\right) \\ &= -\frac{1}{1+e^x} \end{aligned}$$

Mathematica [A] time = 0.01, size = 9, normalized size = 1.00

$$-\frac{1}{e^x+1}$$

Antiderivative was successfully verified.

```
[In] Integrate[(2 + E^(-x) + E^x)^(-1),x]
[Out] -(1 + E^x)^(-1)
```

fricas [A] time = 0.40, size = 8, normalized size = 0.89

$$-\frac{1}{e^x+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(2+exp(-x)+exp(x)),x, algorithm="fricas")
[Out] -1/(e^x + 1)
```

giac [A] time = 0.31, size = 8, normalized size = 0.89

$$-\frac{1}{e^x+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(2+exp(-x)+exp(x)),x, algorithm="giac")
[Out] -1/(e^x + 1)
```

maple [A] time = 0.02, size = 9, normalized size = 1.00

$$-\frac{1}{e^x+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(2+exp(-x)+exp(x)),x)
[Out] -1/(exp(x)+1)
```

maxima [A] time = 1.02, size = 8, normalized size = 0.89

$$\frac{1}{e^{(-x)}+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(2+exp(-x)+exp(x)),x, algorithm="maxima")
[Out] 1/(e^(-x) + 1)
```

mupad [B] time = 0.06, size = 8, normalized size = 0.89

$$-\frac{1}{\mathrm{e}^x+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(exp(-x) + exp(x) + 2),x)
```

```
[Out] -1/(exp(x) + 1)
```

sympy [A] time = 0.08, size = 7, normalized size = 0.78

$$-\frac{1}{e^x+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(2+exp(-x)+exp(x)),x)
```

```
[Out] -1/(exp(x) + 1)
```

3.530 $\int \frac{x}{2+e^{-x}+e^x}\,dx$

Optimal. Leaf size=20

$$-\frac{x}{e^x+1}+x-\log\left(e^x+1\right)$$

```
[Out] x-x/(1+exp(x))-ln(1+exp(x))
```

Rubi [A] time = 0.13, antiderivative size = 20, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {2267, 6688, 2191, 2282, 36, 29, 31}

$$-\frac{x}{e^x+1}+x-\log\left(e^x+1\right)$$

Antiderivative was successfully verified.

```
[In] Int[x/(2 + E^(-x) + E^x),x]
```

```
[Out] x - x/(1 + E^x) - Log[1 + E^x]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 2191

```
Int[((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((a_.) + (b_.)*((F_)^((g_.)*(
(e_.) + (f_.)*(x_))))^(n_.))^(p_.)*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :>
 Simp[((c + d*x)^m*(a + b*(F^(g*(e + f*x)))^n)^(p + 1))/(b*f*g*n*(p + 1)*Lo
g[F]), x] - Dist[(d*m)/(b*f*g*n*(p + 1)*Log[F]), Int[(c + d*x)^(m - 1)*(a +
 b*(F^(g*(e + f*x)))^n)^(p + 1), x], x] /; FreeQ[{F, a, b, c, d, e, f, g, m
, n, p}, x] && NeQ[p, -1]
```

Rule 2267

```
Int[(u_)/((a_) + (b_.)*(F_)^(v_) + (c_.)*(F_)^(w_)), x_Symbol] :> Int[(u*F^
v)/(c + a*F^v + b*F^(2*v)), x] /; FreeQ[{F, a, b, c}, x] && EqQ[w, -v] && L
inearQ[v, x] && If[RationalQ[Coefficient[v, x, 1]], GtQ[Coefficient[v, x, 1
], 0], LtQ[LeafCount[v], LeafCount[w]]]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rubi steps

$$
\begin{aligned}
\int \frac{x}{2+e^{-x}+e^x}\,dx &= \int \frac{e^x x}{1+2e^x+e^{2x}}\,dx\\
&= \int \frac{e^x x}{(1+e^x)^2}\,dx\\
&= -\frac{x}{1+e^x}+\int \frac{1}{1+e^x}\,dx\\
&= -\frac{x}{1+e^x}+\text{Subst}\left(\int \frac{1}{x(1+x)}\,dx,x,e^x\right)\\
&= -\frac{x}{1+e^x}+\text{Subst}\left(\int \frac{1}{x}\,dx,x,e^x\right)-\text{Subst}\left(\int \frac{1}{1+x}\,dx,x,e^x\right)\\
&= x-\frac{x}{1+e^x}-\log\left(1+e^x\right)
\end{aligned}
$$

Mathematica [A] time = 0.03, size = 20, normalized size = 1.00

$$-\frac{x}{e^x+1}+x-\log\left(e^x+1\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x/(2 + E^(-x) + E^x),x]
```

```
[Out] x - x/(1 + E^x) - Log[1 + E^x]
```

fricas [A] time = 0.40, size = 23, normalized size = 1.15

$$\frac{xe^x - (e^x + 1)\log(e^x + 1)}{e^x + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(2+exp(-x)+exp(x)),x, algorithm="fricas")
[Out] (x*e^x - (e^x + 1)*log(e^x + 1))/(e^x + 1)
```

giac [A] time = 0.29, size = 28, normalized size = 1.40

$$\frac{xe^x - e^x\log(e^x + 1) - \log(e^x + 1)}{e^x + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(2+exp(-x)+exp(x)),x, algorithm="giac")
[Out] (x*e^x - e^x*log(e^x + 1) - log(e^x + 1))/(e^x + 1)
```

maple [A] time = 0.02, size = 19, normalized size = 0.95

$$\frac{x\,\mathrm{e}^x}{\mathrm{e}^x + 1} - \ln(\mathrm{e}^x + 1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(2+exp(-x)+exp(x)),x)
[Out] -ln(exp(x)+1)+1/(exp(x)+1)*x*exp(x)
```

maxima [A] time = 1.11, size = 18, normalized size = 0.90

$$\frac{xe^x}{e^x + 1} - \log(e^x + 1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(2+exp(-x)+exp(x)),x, algorithm="maxima")
[Out] x*e^x/(e^x + 1) - log(e^x + 1)
```

mupad [B] time = 0.06, size = 18, normalized size = 0.90

$$\frac{x\,\mathrm{e}^x}{\mathrm{e}^x + 1} - \ln(\mathrm{e}^x + 1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(exp(-x) + exp(x) + 2),x)
```

```
[Out] (x*exp(x))/(exp(x) + 1) - log(exp(x) + 1)
```

sympy [A] time = 0.09, size = 14, normalized size = 0.70

$$x - \frac{x}{e^x + 1} - \log\left(e^x + 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(2+exp(-x)+exp(x)),x)
```

```
[Out] x - x/(exp(x) + 1) - log(exp(x) + 1)
```

3.531 $\int \frac{x^2}{2+e^{-x}+e^x}\,dx$

Optimal. Leaf size=34

$$-2\text{Li}_2\left(-e^x\right)-\frac{x^2}{e^x+1}+x^2-2x\log\left(e^x+1\right)$$

```
[Out] x^2-x^2/(1+exp(x))-2*x*ln(1+exp(x))-2*polylog(2,-exp(x))
```

Rubi [A] time = 0.25, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.438, Rules used = {2267, 6688, 2191, 2184, 2190, 2279, 2391}

$$-2\text{PolyLog}\left(2,-e^x\right)-\frac{x^2}{e^x+1}+x^2-2x\log\left(e^x+1\right)$$

Antiderivative was successfully verified.

```
[In] Int[x^2/(2 + E^(-x) + E^x),x]
```

```
[Out] x^2 - x^2/(1 + E^x) - 2*x*Log[1 + E^x] - 2*PolyLog[2, -E^x]
```

Rule 2184

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[((c + d*x)^m*(F^(g*(e + f*x)))^n)/(a + b*(F^(g*(e + f*x)))^n), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2191

```
Int[((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((a_.) + (b_.)*((F_)^((g_.)*(
(e_.) + (f_.)*(x_))))^(n_.))^(p_.)*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :>
 Simp[((c + d*x)^m*(a + b*(F^(g*(e + f*x)))^n)^(p + 1))/(b*f*g*n*(p + 1)*Lo
g[F]), x] - Dist[(d*m)/(b*f*g*n*(p + 1)*Log[F]), Int[(c + d*x)^(m - 1)*(a +
 b*(F^(g*(e + f*x)))^n)^(p + 1), x], x] /; FreeQ[{F, a, b, c, d, e, f, g, m
, n, p}, x] && NeQ[p, -1]
```

Rule 2267

```
Int[(u_)/((a_) + (b_.)*(F_)^(v_) + (c_.)*(F_)^(w_)), x_Symbol] :> Int[(u*F^
v)/(c + a*F^v + b*F^(2*v)), x] /; FreeQ[{F, a, b, c}, x] && EqQ[w, -v] && L
inearQ[v, x] && If[RationalQ[Coefficient[v, x, 1]], GtQ[Coefficient[v, x, 1
], 0], LtQ[LeafCount[v], LeafCount[w]]]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rubi steps

$$\begin{aligned}
\int \frac{x^2}{2+e^{-x}+e^x}\,dx &= \int \frac{e^x x^2}{1+2e^x+e^{2x}}\,dx \\
&= \int \frac{e^x x^2}{(1+e^x)^2}\,dx \\
&= -\frac{x^2}{1+e^x}+2\int \frac{x}{1+e^x}\,dx \\
&= x^2-\frac{x^2}{1+e^x}-2\int \frac{e^x x}{1+e^x}\,dx \\
&= x^2-\frac{x^2}{1+e^x}-2x\log\left(1+e^x\right)+2\int \log\left(1+e^x\right)\,dx \\
&= x^2-\frac{x^2}{1+e^x}-2x\log\left(1+e^x\right)+2\,\text{Subst}\left(\int \frac{\log(1+x)}{x}\,dx,x,e^x\right) \\
&= x^2-\frac{x^2}{1+e^x}-2x\log\left(1+e^x\right)-2\text{Li}_2\left(-e^x\right)
\end{aligned}$$

Mathematica [A] time = 0.05, size = 33, normalized size = 0.97

$$x\left(\frac{e^x x}{e^x+1}-2\log\left(e^x+1\right)\right)-2\text{Li}_2\left(-e^x\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/(2 + E^(-x) + E^x),x]
[Out] x*((E^x*x)/(1 + E^x) - 2*Log[1 + E^x]) - 2*PolyLog[2, -E^x]
```

fricas [A] time = 0.42, size = 38, normalized size = 1.12

$$\frac{x^2e^x-2\left(e^x+1\right)\text{Li}_2\left(-e^x\right)-2\left(xe^x+x\right)\log\left(e^x+1\right)}{e^x+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(2+exp(-x)+exp(x)),x, algorithm="fricas")
[Out] (x^2*e^x - 2*(e^x + 1)*dilog(-e^x) - 2*(x*e^x + x)*log(e^x + 1))/(e^x + 1)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{x^2}{e^{(-x)}+e^x+2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(2+exp(-x)+exp(x)),x, algorithm="giac")
[Out] integrate(x^2/(e^(-x) + e^x + 2), x)
```

maple [A] time = 0.03, size = 32, normalized size = 0.94

$$x^2-\frac{x^2}{\mathrm{e}^x+1}-2x\ln\left(\mathrm{e}^x+1\right)-2\,\mathrm{polylog}\left(2,-\mathrm{e}^x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(2+exp(-x)+exp(x)),x)
[Out] x^2-1/(exp(x)+1)*x^2-2*x*ln(exp(x)+1)-2*polylog(2,-exp(x))
```

maxima [A] time = 0.90, size = 30, normalized size = 0.88

$$x^2-2\,x\log\left(e^x+1\right)-\frac{x^2}{e^x+1}-2\,\text{Li}_2\left(-e^x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(2+exp(-x)+exp(x)),x, algorithm="maxima")
```

```
[Out] x^2 - 2*x*log(e^x + 1) - x^2/(e^x + 1) - 2*dilog(-e^x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^2}{e^{-x} + e^x + 2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(exp(-x) + exp(x) + 2),x)
```

```
[Out] int(x^2/(exp(-x) + exp(x) + 2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{x^2}{e^x + 1} + 2\int \frac{x}{e^x + 1} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(2+exp(-x)+exp(x)),x)
```

```
[Out] -x**2/(exp(x) + 1) + 2*Integral(x/(exp(x) + 1), x)
```

3.532 $\int \frac{1}{2+f^{-c-dx}+f^{c+dx}}\,dx$

Optimal. Leaf size=20

$$-\frac{1}{d\log(f)\left(f^{c+dx}+1\right)}$$

```
[Out] -1/d/(1+f^(d*x+c))/ln(f)
```

Rubi [A] time = 0.02, antiderivative size = 20, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2282, 32}

$$-\frac{1}{d\log(f)\left(f^{c+dx}+1\right)}$$

Antiderivative was successfully verified.

```
[In] Int[(2 + f^(-c - d*x) + f^(c + d*x))^(-1),x]
```

```
[Out] -(1/(d*(1 + f^(c + d*x))*Log[f]))
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] && !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] && !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}\int \frac{1}{2+f^{-c-dx}+f^{c+dx}}\,dx &= \frac{\text{Subst}\left(\int \frac{1}{(1+x)^2}\,dx, x, f^{c+dx}\right)}{d\log(f)}\\ &= -\frac{1}{d\left(1+f^{c+dx}\right)\log(f)}\end{aligned}$$

Mathematica [A] time = 0.02, size = 20, normalized size = 1.00

$$-\frac{1}{d\log(f)\left(f^{c+dx}+1\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(2 + f^(-c - d*x) + f^(c + d*x))^(-1),x]
[Out] -(1/(d*(1 + f^(c + d*x))*Log[f]))
```

fricas [A] time = 0.41, size = 20, normalized size = 1.00

$$-\frac{1}{df^{dx+c}\log(f)+d\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(2+f^(-d*x-c)+f^(d*x+c)),x, algorithm="fricas")
[Out] -1/(d*f^(d*x + c)*log(f) + d*log(f))
```

giac [A] time = 0.38, size = 22, normalized size = 1.10

$$-\frac{1}{\left(f^{dx}f^{c}+1\right)d\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(2+f^(-d*x-c)+f^(d*x+c)),x, algorithm="giac")
[Out] -1/((f^(d*x)*f^c + 1)*d*log(f))
```

maple [A] time = 0.03, size = 25, normalized size = 1.25

$$\frac{1}{\left(e^{(-dx-c)\ln(f)}+1\right)d\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(2+f^(-d*x-c)+f^(d*x+c)),x)
[Out] 1/d/ln(f)/(exp((-d*x-c)*ln(f))+1)
```

maxima [A] time = 0.93, size = 22, normalized size = 1.10

$$\frac{1}{d\left(f^{-dx-c}+1\right)\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(2+f^(-d*x-c)+f^(d*x+c)),x, algorithm="maxima")
```

```
[Out] 1/(d*(f^(-d*x - c) + 1)*log(f))
```

mupad [B] time = 3.56, size = 20, normalized size = 1.00

$$-\frac{1}{d\,\ln(f)\,\left(f^{c+d\,x}+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(1/f^(c + d*x) + f^(c + d*x) + 2),x)
```

```
[Out] -1/(d*log(f)*(f^(c + d*x) + 1))
```

sympy [A] time = 0.11, size = 19, normalized size = 0.95

$$-\frac{1}{df^{c+dx}\log\left(f\right)+d\log\left(f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(2+f**(-d*x-c)+f**(d*x+c)),x)
```

```
[Out] -1/(d*f**(c + d*x)*log(f) + d*log(f))
```

3.533 $\int \frac{x}{2+f^{-c-dx}+f^{c+dx}}\,dx$

Optimal. Leaf size=50

$$-\frac{\log\left(f^{c+dx}+1\right)}{d^2\log^2(f)}-\frac{x}{d\log(f)\left(f^{c+dx}+1\right)}+\frac{x}{d\log(f)}$$

```
[Out] x/d/ln(f)-x/d/(1+f^(d*x+c))/ln(f)-ln(1+f^(d*x+c))/d^2/ln(f)^2
```

Rubi [A] time = 0.29, antiderivative size = 50, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {2267, 6688, 2191, 2282, 36, 29, 31}

$$-\frac{\log\left(f^{c+dx}+1\right)}{d^2\log^2(f)}-\frac{x}{d\log(f)\left(f^{c+dx}+1\right)}+\frac{x}{d\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[x/(2 + f^(-c - d*x) + f^(c + d*x)),x]
```

```
[Out] x/(d*Log[f]) - x/(d*(1 + f^(c + d*x))*Log[f]) - Log[1 + f^(c + d*x)]/(d^2*L
og[f]^2)
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 2191

```
Int[((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((a_.) + (b_.)*((F_)^((g_.)*(
(e_.) + (f_.)*(x_))))^(n_.))^(p_.)*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :>
 Simp[((c + d*x)^m*(a + b*(F^(g*(e + f*x)))^n)^(p + 1))/(b*f*g*n*(p + 1)*Lo
g[F]), x] - Dist[(d*m)/(b*f*g*n*(p + 1)*Log[F]), Int[(c + d*x)^(m - 1)*(a +
```

```
b*(F^(g*(e + f*x)))^n)^(p + 1), x], x] /; FreeQ[{F, a, b, c, d, e, f, g, m
, n, p}, x] && NeQ[p, -1]
```

Rule 2267

```
Int[(u_)/((a_) + (b_.)*(F_)^(v_) + (c_.)*(F_)^(w_)), x_Symbol] :> Int[(u*F^
v)/(c + a*F^v + b*F^(2*v)), x] /; FreeQ[{F, a, b, c}, x] && EqQ[w, -v] && L
inearQ[v, x] && If[RationalQ[Coefficient[v, x, 1]], GtQ[Coefficient[v, x, 1
], 0], LtQ[LeafCount[v], LeafCount[w]]]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rubi steps

$$\int \frac{x}{2+f^{-c-dx}+f^{c+dx}}\,dx = \int \frac{f^{c+dx}x}{1+2f^{c+dx}+f^{2(c+dx)}}\,dx$$
$$= \int \frac{f^{c+dx}x}{\left(1+f^{c+dx}\right)^2}\,dx$$
$$= -\frac{x}{d\left(1+f^{c+dx}\right)\log(f)} + \frac{\int \frac{1}{1+f^{c+dx}}\,dx}{d\log(f)}$$
$$= -\frac{x}{d\left(1+f^{c+dx}\right)\log(f)} + \frac{\text{Subst}\left(\int \frac{1}{x(1+x)}\,dx, x, f^{c+dx}\right)}{d^2\log^2(f)}$$
$$= -\frac{x}{d\left(1+f^{c+dx}\right)\log(f)} + \frac{\text{Subst}\left(\int \frac{1}{x}\,dx, x, f^{c+dx}\right)}{d^2\log^2(f)} - \frac{\text{Subst}\left(\int \frac{1}{1+x}\,dx, x, f^{c+dx}\right)}{d^2\log^2(f)}$$
$$= \frac{x}{d\log(f)} - \frac{x}{d\left(1+f^{c+dx}\right)\log(f)} - \frac{\log\left(1+f^{c+dx}\right)}{d^2\log^2(f)}$$

Mathematica [**A**] time = 0.07, size = 44, normalized size = 0.88

$$\frac{\frac{dx\log(f)f^{c+dx}}{f^{c+dx}+1} - \log\left(f^{c+dx}+1\right)}{d^2\log^2(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[x/(2 + f^(-c - d*x) + f^(c + d*x)),x]
```

```
[Out] ((d*f^(c + d*x)*x*Log[f])/(1 + f^(c + d*x)) - Log[1 + f^(c + d*x)])/(d^2*Lo
g[f]^2)
```

fricas [**A**] time = 0.42, size = 61, normalized size = 1.22

$$\frac{df^{dx+c}x\log(f) - \left(f^{dx+c}+1\right)\log\left(f^{dx+c}+1\right)}{d^2f^{dx+c}\log(f)^2 + d^2\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(2+f^(-d*x-c)+f^(d*x+c)),x, algorithm="fricas")
```

```
[Out] (d*f^(d*x + c)*x*log(f) - (f^(d*x + c) + 1)*log(f^(d*x + c) + 1))/(d^2*f^(d
*x + c)*log(f)^2 + d^2*log(f)^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{f^{dx+c} + f^{-dx-c} + 2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(2+f^(-d*x-c)+f^(d*x+c)),x, algorithm="giac")
```

```
[Out] integrate(x/(f^(d*x + c) + f^(-d*x - c) + 2), x)
```

maple [A] time = 0.03, size = 64, normalized size = 1.28

$$-\frac{x\,\mathrm{e}^{(-dx-c)\ln(f)}}{\left(\mathrm{e}^{(-dx-c)\ln(f)}+1\right) d\ln(f)} - \frac{\ln\left(\mathrm{e}^{(-dx-c)\ln(f)}+1\right)}{d^2\ln(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(2+f^(-d*x-c)+f^(d*x+c)),x)
```

```
[Out] -1/d/ln(f)*x*exp((-d*x-c)*ln(f))/(exp((-d*x-c)*ln(f))+1)-1/d^2/ln(f)^2*ln(e
xp((-d*x-c)*ln(f))+1)
```

maxima [A] time = 1.26, size = 57, normalized size = 1.14

$$\frac{f^{dx}f^{c}x}{df^{dx}f^{c}\log(f) + d\log(f)} - \frac{\log\left(\frac{f^{dx}f^{c}+1}{f^{c}}\right)}{d^2\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(2+f^(-d*x-c)+f^(d*x+c)),x, algorithm="maxima")
```

```
[Out] f^(d*x)*f^c*x/(d*f^(d*x)*f^c*log(f) + d*log(f)) - log((f^(d*x)*f^c + 1)/f^c
)/(d^2*log(f)^2)
```

mupad [B] time = 3.62, size = 52, normalized size = 1.04

$$\frac{f^{d\,x}\,f^c\,x}{d\,\ln(f)\,\left(f^{d\,x}\,f^c+1\right)} - \frac{\ln\left(f^{d\,x}\,f^c+1\right)}{d^2\ln(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(1/f^(c + d*x) + f^(c + d*x) + 2),x)
```

```
[Out] (f^(d*x)*f^c*x)/(d*log(f)*(f^(d*x)*f^c + 1)) - log(f^(d*x)*f^c + 1)/(d^2*lo
g(f)^2)
```

sympy [A] time = 0.15, size = 42, normalized size = 0.84

$$-\frac{x}{df^{c+dx}\log(f)+d\log(f)}+\frac{x}{d\log(f)}-\frac{\log\left(f^{c+dx}+1\right)}{d^2\log(f)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(2+f**(-d*x-c)+f**(d*x+c)),x)
```

```
[Out] -x/(d*f**(c + d*x)*log(f) + d*log(f)) + x/(d*log(f)) - log(f**(c + d*x) + 1
)/(d**2*log(f)**2)
```

3.534 $\int \frac{x^2}{2+f^{-c-dx}+f^{c+dx}}\,dx$

Optimal. Leaf size=75

$$-\frac{2\text{Li}_2\left(-f^{c+dx}\right)}{d^3\log^3(f)}-\frac{2x\log\left(f^{c+dx}+1\right)}{d^2\log^2(f)}-\frac{x^2}{d\log(f)\left(f^{c+dx}+1\right)}+\frac{x^2}{d\log(f)}$$

```
[Out] x^2/d/ln(f)-x^2/d/(1+f^(d*x+c))/ln(f)-2*x*ln(1+f^(d*x+c))/d^2/ln(f)^2-2*pol
ylog(2,-f^(d*x+c))/d^3/ln(f)^3
```

Rubi [A] time = 0.49, antiderivative size = 75, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.280, Rules used = {2267, 6688, 2191, 2184, 2190, 2279, 2391}

$$-\frac{2\text{PolyLog}\left(2,-f^{c+dx}\right)}{d^3\log^3(f)}-\frac{2x\log\left(f^{c+dx}+1\right)}{d^2\log^2(f)}-\frac{x^2}{d\log(f)\left(f^{c+dx}+1\right)}+\frac{x^2}{d\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/(2 + f^(-c - d*x) + f^(c + d*x)),x]
```

```
[Out] x^2/(d*Log[f]) - x^2/(d*(1 + f^(c + d*x))*Log[f]) - (2*x*Log[1 + f^(c + d*x
)])/(d^2*Log[f]^2) - (2*PolyLog[2, -f^(c + d*x)])/(d^3*Log[f]^3)
```

Rule 2184

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[((c + d*x)^m*(F^(g*(e + f*x)))^n)/(a + b*(F^(g*(e + f*x)))^n), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2191

```
Int[((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((a_.) + (b_.)*((F_)^((g_.)*(
(e_.) + (f_.)*(x_))))^(n_.))^(p_.)*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :>
 Simp[((c + d*x)^m*(a + b*(F^(g*(e + f*x)))^n)^(p + 1))/(b*f*g*n*(p + 1)*Lo
```

```
g[F]), x] - Dist[(d*m)/(b*f*g*n*(p + 1)*Log[F]), Int[(c + d*x)^(m - 1)*(a +
 b*(F^(g*(e + f*x)))^n)^(p + 1), x], x] /; FreeQ[{F, a, b, c, d, e, f, g, m
, n, p}, x] && NeQ[p, -1]
```

Rule 2267

```
Int[(u_)/((a_) + (b_.)*(F_)^(v_) + (c_.)*(F_)^(w_)), x_Symbol] :> Int[(u*F^
v)/(c + a*F^v + b*F^(2*v)), x] /; FreeQ[{F, a, b, c}, x] && EqQ[w, -v] && L
inearQ[v, x] && If[RationalQ[Coefficient[v, x, 1]], GtQ[Coefficient[v, x, 1
], 0], LtQ[LeafCount[v], LeafCount[w]]]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rubi steps

$$\int \frac{x^2}{2+f^{-c-dx}+f^{c+dx}}\,dx = \int \frac{f^{c+dx}x^2}{1+2f^{c+dx}+f^{2(c+dx)}}\,dx$$
$$= \int \frac{f^{c+dx}x^2}{\left(1+f^{c+dx}\right)^2}\,dx$$
$$= -\frac{x^2}{d\left(1+f^{c+dx}\right)\log(f)} + \frac{2\int \frac{x}{1+f^{c+dx}}\,dx}{d\log(f)}$$
$$= \frac{x^2}{d\log(f)} - \frac{x^2}{d\left(1+f^{c+dx}\right)\log(f)} - \frac{2\int \frac{f^{c+dx}x}{1+f^{c+dx}}\,dx}{d\log(f)}$$
$$= \frac{x^2}{d\log(f)} - \frac{x^2}{d\left(1+f^{c+dx}\right)\log(f)} - \frac{2x\log\left(1+f^{c+dx}\right)}{d^2\log^2(f)} + \frac{2\int \log\left(1+f^{c+dx}\right)\,dx}{d^2\log^2(f)}$$
$$= \frac{x^2}{d\log(f)} - \frac{x^2}{d\left(1+f^{c+dx}\right)\log(f)} - \frac{2x\log\left(1+f^{c+dx}\right)}{d^2\log^2(f)} + \frac{2\,\text{Subst}\left(\int \frac{\log(1+x)}{x}\,dx, x, f^{c+dx}\right)}{d^3\log^3(f)}$$
$$= \frac{x^2}{d\log(f)} - \frac{x^2}{d\left(1+f^{c+dx}\right)\log(f)} - \frac{2x\log\left(1+f^{c+dx}\right)}{d^2\log^2(f)} - \frac{2\text{Li}_2\left(-f^{c+dx}\right)}{d^3\log^3(f)}$$

Mathematica [A] time = 0.12, size = 63, normalized size = 0.84

$$\frac{dx\log(f)\left(\frac{dx\log(f)f^{c+dx}}{f^{c+dx}+1} - 2\log\left(f^{c+dx}+1\right)\right) - 2\text{Li}_2\left(-f^{c+dx}\right)}{d^3\log^3(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/(2 + f^(-c - d*x) + f^(c + d*x)),x]
```

```
[Out] (d*x*Log[f]*((d*f^(c + d*x)*x*Log[f])/(1 + f^(c + d*x)) - 2*Log[1 + f^(c +
d*x)]) - 2*PolyLog[2, -f^(c + d*x)])/(d^3*Log[f]^3)
```

fricas [A] time = 0.42, size = 114, normalized size = 1.52

$$-\frac{c^2\log(f)^2 - \left(d^2x^2-c^2\right)f^{dx+c}\log(f)^2 + 2\left(f^{dx+c}+1\right)\text{Li}_2\left(-f^{dx+c}\right) + 2\left(df^{dx+c}x\log(f) + dx\log(f)\right)\log\left(f^{dx+c}\right.}{d^3f^{dx+c}\log(f)^3 + d^3\log(f)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(2+f^(-d*x-c)+f^(d*x+c)),x, algorithm="fricas")
```

```
[Out] -(c^2*log(f)^2 - (d^2*x^2 - c^2)*f^(d*x + c)*log(f)^2 + 2*(f^(d*x + c) + 1)
*dilog(-f^(d*x + c)) + 2*(d*f^(d*x + c)*x*log(f) + d*x*log(f))*log(f^(d*x +
 c) + 1))/(d^3*f^(d*x + c)*log(f)^3 + d^3*log(f)^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{f^{dx+c} + f^{-dx-c} + 2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(2+f^(-d*x-c)+f^(d*x+c)),x, algorithm="giac")
```

```
[Out] integrate(x^2/(f^(d*x + c) + f^(-d*x - c) + 2), x)
```

maple [A] time = 0.08, size = 134, normalized size = 1.79

$$\frac{x^2}{\left(f^{-dx-c}+1\right)d\ln(f)}-\frac{x^2}{d\ln(f)}-\frac{2cx}{d^2\ln(f)}-\frac{c^2}{d^3\ln(f)}-\frac{2x\ln\left(f^{-c}f^{-dx}+1\right)}{d^2\ln(f)^2}-\frac{2c\ln\left(f^{-c}f^{-dx}\right)}{d^3\ln(f)^2}+\frac{2\,\mathrm{polylog}\left(2,-f^{-c}f^{-dx}\right)}{d^3\ln(f)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(2+f^(-d*x-c)+f^(d*x+c)),x)
```

```
[Out] 1/d/ln(f)*x^2/(f^(-d*x-c)+1)-1/d*x^2/ln(f)-2*c/d^2*x/ln(f)-c^2/d^3/ln(f)-2/
ln(f)^2/d^2*ln(f^(-d*x)*f^(-c)+1)*x+2/ln(f)^3/d^3*polylog(2,-f^(-d*x)*f^(-c
))-2/ln(f)^2/d^3*c*ln(f^(-d*x)*f^(-c))
```

maxima [A] time = 1.27, size = 74, normalized size = 0.99

$$-\frac{x^2}{df^{dx}f^c\log(f)+d\log(f)}+\frac{x^2}{d\log(f)}-\frac{2\left(dx\log\left(f^{dx}f^c+1\right)\log(f)+\mathrm{Li}_2\left(-f^{dx}f^c\right)\right)}{d^3\log(f)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(2+f^(-d*x-c)+f^(d*x+c)),x, algorithm="maxima")
```

```
[Out] -x^2/(d*f^(d*x)*f^c*log(f) + d*log(f)) + x^2/(d*log(f)) - 2*(d*x*log(f^(d*x
)*f^c + 1)*log(f) + dilog(-f^(d*x)*f^c))/(d^3*log(f)^3)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2}{\frac{1}{f^{c+d\,x}} + f^{c+d\,x} + 2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(1/f^(c + d*x) + f^(c + d*x) + 2),x)
```

```
[Out] int(x^2/(1/f^(c + d*x) + f^(c + d*x) + 2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{x^2}{df^{c+dx}\log(f) + d\log(f)} + \frac{2\int \frac{x}{e^{c\log(f)}e^{dx\log(f)}+1}\,dx}{d\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(2+f**(-d*x-c)+f**(d*x+c)),x)
```

```
[Out] -x**2/(d*f**(c + d*x)*log(f) + d*log(f)) + 2*Integral(x/(exp(c*log(f))*exp(
d*x*log(f)) + 1), x)/(d*log(f))
```

3.535 $\int \frac{1}{2+3^{-x}+3^x} dx$

Optimal. Leaf size=13

$$-\frac{1}{(3^x+1)\log(3)}$$

```
[Out] -1/(1+3^x)/ln(3)
```

Rubi [A] time = 0.01, antiderivative size = 13, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {2282, 32}

$$-\frac{1}{(3^x+1)\log(3)}$$

Antiderivative was successfully verified.

```
[In] Int[(2 + 3^(-x) + 3^x)^(-1),x]
```

```
[Out] -(1/((1 + 3^x)*Log[3]))
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m + 
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}\int \frac{1}{2+3^{-x}+3^x} \, dx &= \frac{\text{Subst}\left(\int \frac{1}{(1+x)^2} \, dx, x, 3^x\right)}{\log(3)}\\ &= -\frac{1}{(1+3^x)\log(3)}\end{aligned}$$

Mathematica [A] time = 0.01, size = 13, normalized size = 1.00

$$-\frac{1}{(3^x+1)\log(3)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(2 + 3^(-x) + 3^x)^(-1),x]
[Out] -(1/((1 + 3^x)*Log[3]))
```

fricas [A] time = 0.39, size = 13, normalized size = 1.00

$$-\frac{1}{3^x\log(3)+\log(3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(2+1/(3^x)+3^x),x, algorithm="fricas")
[Out] -1/(3^x*log(3) + log(3))
```

giac [A] time = 0.32, size = 13, normalized size = 1.00

$$-\frac{1}{(3^x+1)\log(3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(2+1/(3^x)+3^x),x, algorithm="giac")
[Out] -1/((3^x + 1)*log(3))
```

maple [A] time = 0.01, size = 14, normalized size = 1.08

$$-\frac{1}{(3^x+1)\ln(3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(2+1/(3^x)+3^x),x)
[Out] -1/(1+3^x)/ln(3)
```

maxima [A] time = 1.09, size = 14, normalized size = 1.08

$$\frac{1}{\left(\frac{1}{3^x}+1\right)\log(3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(2+1/(3^x)+3^x),x, algorithm="maxima")
```

```
[Out] 1/((1/3^x + 1)*log(3))
```

mupad [B] time = 3.48, size = 13, normalized size = 1.00

$$-\frac{1}{\ln(3)\ (3^x+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(1/3^x + 3^x + 2),x)
```

```
[Out] -1/(log(3)*(3^x + 1))
```

sympy [A] time = 0.09, size = 12, normalized size = 0.92

$$-\frac{1}{3^x\log{(3)}+\log{(3)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(2+1/(3**x)+3**x),x)
```

```
[Out] -1/(3**x*log(3) + log(3))
```

3.536 $\int \frac{1}{1-e^{-x}+2e^x}\,dx$

Optimal. Leaf size=23

$$\frac{1}{3}\log\left(1-2e^x\right)-\frac{1}{3}\log\left(e^x+1\right)$$

```
[Out] 1/3*ln(1-2*exp(x))-1/3*ln(1+exp(x))
```

Rubi [A] time = 0.02, antiderivative size = 23, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.188, Rules used = {2282, 616, 31}

$$\frac{1}{3}\log\left(1-2e^x\right)-\frac{1}{3}\log\left(e^x+1\right)$$

Antiderivative was successfully verified.

```
[In] Int[(1 - E^(-x) + 2*E^x)^(-1),x]
```

```
[Out] Log[1 - 2*E^x]/3 - Log[1 + E^x]/3
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x, x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 616

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[c/q, Int[1/Simp[b/2 - q/2 + c*x, x], x], x] - Dist[c/q, Int[1/Simp[b/2 + q/2 + c*x, x], x], x]] /; FreeQ[{a, b, c}, x] && NeQ[b^2 - 4*a*c, 0] && PosQ[b^2 - 4*a*c] && PerfectSquareQ[b^2 - 4*a*c]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x], Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; FunctionOfExponentialQ[u, x] && !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[{a, m, n}, x] && IntegerQ[m*n]] && !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\int \frac{1}{1-e^{-x}+2e^x}\,dx = \text{Subst}\left(\int \frac{1}{-1+x+2x^2}\,dx, x, e^x\right)$$
$$= \frac{2}{3}\text{Subst}\left(\int \frac{1}{-1+2x}\,dx, x, e^x\right) - \frac{2}{3}\text{Subst}\left(\int \frac{1}{2+2x}\,dx, x, e^x\right)$$
$$= \frac{1}{3}\log\left(1-2e^x\right) - \frac{1}{3}\log\left(1+e^x\right)$$

Mathematica [**A**] time = 0.01, size = 16, normalized size = 0.70

$$-\frac{2}{3}\tanh^{-1}\left(\frac{1}{3}\left(4e^x+1\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(1 - E^(-x) + 2*E^x)^(-1),x]
[Out] (-2*ArcTanh[(1 + 4*E^x)/3])/3
```

fricas [**A**] time = 0.41, size = 17, normalized size = 0.74

$$\frac{1}{3}\log\left(2e^x-1\right) - \frac{1}{3}\log\left(e^x+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(1-1/exp(x)+2*exp(x)),x, algorithm="fricas")
[Out] 1/3*log(2*e^x - 1) - 1/3*log(e^x + 1)
```

giac [**A**] time = 0.29, size = 18, normalized size = 0.78

$$-\frac{1}{3}\log\left(e^x+1\right) + \frac{1}{3}\log\left(|2e^x-1|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(1-1/exp(x)+2*exp(x)),x, algorithm="giac")
[Out] -1/3*log(e^x + 1) + 1/3*log(abs(2*e^x - 1))
```

maple [**A**] time = 0.01, size = 18, normalized size = 0.78

$$-\frac{\ln\left(e^x+1\right)}{3} + \frac{\ln\left(2e^x-1\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(1-1/exp(x)+2*exp(x)),x)
```

```
[Out] 1/3*ln(2*exp(x)-1)-1/3*ln(exp(x)+1)
```

maxima [A] time = 1.04, size = 19, normalized size = 0.83

$$-\frac{1}{3}\log\left(e^{(-x)}+1\right)+\frac{1}{3}\log\left(e^{(-x)}-2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(1-1/exp(x)+2*exp(x)),x, algorithm="maxima")
```

```
[Out] -1/3*log(e^(-x) + 1) + 1/3*log(e^(-x) - 2)
```

mupad [B] time = 0.12, size = 17, normalized size = 0.74

$$\frac{\ln\left(2\,e^x-1\right)}{3}-\frac{\ln\left(e^x+1\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(2*exp(x) - exp(-x) + 1),x)
```

```
[Out] log(2*exp(x) - 1)/3 - log(exp(x) + 1)/3
```

sympy [A] time = 0.12, size = 17, normalized size = 0.74

$$\frac{\log\left(e^{x}-\frac{1}{2}\right)}{3}-\frac{\log\left(e^{x}+1\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(1-1/exp(x)+2*exp(x)),x)
```

```
[Out] log(exp(x) - 1/2)/3 - log(exp(x) + 1)/3
```

3.537 $\int \frac{1}{a+be^{-x}+ce^x}\,dx$

Optimal. Leaf size=36

$$-\frac{2\tanh^{-1}\left(\frac{a+2ce^x}{\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}}$$

```
[Out] -2*arctanh((a+2*c*exp(x))/(a^2-4*b*c)^(1/2))/(a^2-4*b*c)^(1/2)
```

Rubi [A] time = 0.06, antiderivative size = 36, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {2282, 1386, 618, 206}

$$-\frac{2\tanh^{-1}\left(\frac{a+2ce^x}{\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/E^x + c*E^x)^(-1),x]
```

```
[Out] (-2*ArcTanh[(a + 2*c*E^x)/Sqrt[a^2 - 4*b*c]])/Sqrt[a^2 - 4*b*c]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 618

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> Dist[-2, Subst[I
nt[1/Simp[b^2 - 4*a*c - x^2, x], x], x, b + 2*c*x], x] /; FreeQ[{a, b, c},
x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 1386

```
Int[(x_)^(m_.)*((a_) + (c_.)*(x_)^(n_.) + (b_.)*(x_)^(mn_))^(p_.), x_Symbol
] :> Int[x^(m - n*p)*(b + a*x^n + c*x^(2*n))^p, x] /; FreeQ[{a, b, c, m, n}
, x] && EqQ[mn, -n] && IntegerQ[p] && PosQ[n]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
```

```
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}\int \frac{1}{a+be^{-x}+ce^{x}}\,dx &= \text{Subst}\left(\int \frac{1}{x\left(a+\frac{b}{x}+cx\right)}\,dx, x, e^{x}\right)\\ &= \text{Subst}\left(\int \frac{1}{b+ax+cx^{2}}\,dx, x, e^{x}\right)\\ &= -\left(2\,\text{Subst}\left(\int \frac{1}{a^{2}-4bc-x^{2}}\,dx, x, a+2ce^{x}\right)\right)\\ &= -\frac{2\tanh^{-1}\left(\frac{a+2ce^{x}}{\sqrt{a^{2}-4bc}}\right)}{\sqrt{a^{2}-4bc}}\end{aligned}$$

Mathematica [A] time = 0.02, size = 36, normalized size = 1.00

$$-\frac{2\tanh^{-1}\left(\frac{a+2ce^{x}}{\sqrt{a^{2}-4bc}}\right)}{\sqrt{a^{2}-4bc}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/E^x + c*E^x)^(-1),x]
[Out] (-2*ArcTanh[(a + 2*c*E^x)/Sqrt[a^2 - 4*b*c]])/Sqrt[a^2 - 4*b*c]
```

fricas [A] time = 0.43, size = 126, normalized size = 3.50

$$\left[\frac{\log\left(\frac{2\,c^{2}e^{(2\,x)}+2\,ace^{x}+a^{2}-2\,bc-\sqrt{a^{2}-4\,bc}\,(2\,ce^{x}+a)}{ce^{(2\,x)}+ae^{x}+b}\right)}{\sqrt{a^{2}-4\,bc}},\,-\frac{2\sqrt{-a^{2}+4\,bc}\,\arctan\left(-\frac{\sqrt{-a^{2}+4\,bc}\,(2\,ce^{x}+a)}{a^{2}-4\,bc}\right)}{a^{2}-4\,bc}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b/exp(x)+c*exp(x)),x, algorithm="fricas")
[Out] [log((2*c^2*e^(2*x) + 2*a*c*e^x + a^2 - 2*b*c - sqrt(a^2 - 4*b*c)*(2*c*e^x
+ a))/(c*e^(2*x) + a*e^x + b))/sqrt(a^2 - 4*b*c), -2*sqrt(-a^2 + 4*b*c)*arc
tan(-sqrt(-a^2 + 4*b*c)*(2*c*e^x + a)/(a^2 - 4*b*c))/(a^2 - 4*b*c)]
```

giac [A] time = 0.25, size = 35, normalized size = 0.97

$$\frac{2 \arctan\left(\frac{2 ce^{x}+a}{\sqrt{-a^{2}+4 bc}}\right)}{\sqrt{-a^{2}+4 bc}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b/exp(x)+c*exp(x)),x, algorithm="giac")
[Out] 2*arctan((2*c*e^x + a)/sqrt(-a^2 + 4*b*c))/sqrt(-a^2 + 4*b*c)
```

maple [A] time = 0.01, size = 36, normalized size = 1.00

$$\frac{2 \arctan\left(\frac{2c\,\mathrm{e}^{x}+a}{\sqrt{-a^{2}+4bc}}\right)}{\sqrt{-a^{2}+4bc}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a+b/exp(x)+c*exp(x)),x)
[Out] 2/(-a^2+4*b*c)^(1/2)*arctan((a+2*c*exp(x))/(-a^2+4*b*c)^(1/2))
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b/exp(x)+c*exp(x)),x, algorithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*b*c-a^2>0)', see `assume?` for mo
re details)Is 4*b*c-a^2 positive or negative?
```

mupad [B] time = 0.21, size = 35, normalized size = 0.97

$$\frac{2 \,\mathrm{atan}\left(\frac{a+2\,c\,\mathrm{e}^{x}}{\sqrt{4\,b\,c-a^{2}}}\right)}{\sqrt{4\,b\,c-a^{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a + c*exp(x) + b*exp(-x)),x)
[Out] (2*atan((a + 2*c*exp(x))/(4*b*c - a^2)^(1/2)))/(4*b*c - a^2)^(1/2)
```

sympy [A] time = 0.26, size = 36, normalized size = 1.00

$$\text{RootSum}\left(z^2\left(a^2-4bc\right)-1,\left(i\mapsto i\log\left(e^x+\frac{-ia^2+4ibc+a}{2c}\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b/exp(x)+c*exp(x)),x)
```

```
[Out] RootSum(_z**2*(a**2 - 4*b*c) - 1, Lambda(_i, _i*log(exp(x) + (-_i*a**2 + 4*
_i*b*c + a)/(2*c))))
```

3.538 $\int \frac{x}{a+be^{-x}+ce^x} dx$

Optimal. Leaf size=159

$$\frac{\text{Li}_2\left(-\frac{2ce^x}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}}-\frac{\text{Li}_2\left(-\frac{2ce^x}{a+\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}}+\frac{x\log\left(\frac{2ce^x}{a-\sqrt{a^2-4bc}}+1\right)}{\sqrt{a^2-4bc}}-\frac{x\log\left(\frac{2ce^x}{\sqrt{a^2-4bc}+a}+1\right)}{\sqrt{a^2-4bc}}$$

```
[Out] x*ln(1+2*c*exp(x)/(a-(a^2-4*b*c)^(1/2)))/(a^2-4*b*c)^(1/2)-x*ln(1+2*c*exp(x
)/(a+(a^2-4*b*c)^(1/2)))/(a^2-4*b*c)^(1/2)+polylog(2,-2*c*exp(x)/(a-(a^2-4*
b*c)^(1/2)))/(a^2-4*b*c)^(1/2)-polylog(2,-2*c*exp(x)/(a+(a^2-4*b*c)^(1/2)))
/(a^2-4*b*c)^(1/2)
```

Rubi [A] time = 0.30, antiderivative size = 159, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 5, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.278, Rules used = {2267, 2264, 2190, 2279, 2391}

$$\frac{\text{PolyLog}\left(2,-\frac{2ce^x}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}}-\frac{\text{PolyLog}\left(2,-\frac{2ce^x}{\sqrt{a^2-4bc}+a}\right)}{\sqrt{a^2-4bc}}+\frac{x\log\left(\frac{2ce^x}{a-\sqrt{a^2-4bc}}+1\right)}{\sqrt{a^2-4bc}}-\frac{x\log\left(\frac{2ce^x}{\sqrt{a^2-4bc}+a}+1\right)}{\sqrt{a^2-4bc}}$$

Antiderivative was successfully verified.

```
[In] Int[x/(a + b/E^x + c*E^x),x]
```

```
[Out] (x*Log[1 + (2*c*E^x)/(a - Sqrt[a^2 - 4*b*c])])/Sqrt[a^2 - 4*b*c] - (x*Log[1
 + (2*c*E^x)/(a + Sqrt[a^2 - 4*b*c])])/Sqrt[a^2 - 4*b*c] + PolyLog[2, (-2*c
*E^x)/(a - Sqrt[a^2 - 4*b*c])]/Sqrt[a^2 - 4*b*c] - PolyLog[2, (-2*c*E^x)/(a
 + Sqrt[a^2 - 4*b*c])]/Sqrt[a^2 - 4*b*c]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2264

```
Int[((F_)^(u_)*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F_)^(u_) + (c_.)
*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[(2*c)/q, Int[
((f + g*x)^m*F^u)/(b - q + 2*c*F^u), x], x] - Dist[(2*c)/q, Int[((f + g*x)^
m*F^u)/(b + q + 2*c*F^u), x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v,
 2*u] && LinearQ[u, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2267

```
Int[(u_)/((a_) + (b_.)*(F_)^(v_) + (c_.)*(F_)^(w_)), x_Symbol] :> Int[(u*F^
v)/(c + a*F^v + b*F^(2*v)), x] /; FreeQ[{F, a, b, c}, x] && EqQ[w, -v] && L
inearQ[v, x] && If[RationalQ[Coefficient[v, x, 1]], GtQ[Coefficient[v, x, 1
], 0], LtQ[LeafCount[v], LeafCount[w]]]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x}{a+be^{-x}+ce^x}\,dx = \int \frac{e^x x}{b+ae^x+ce^{2x}}\,dx$$

$$= \frac{(2c)\int \frac{e^x x}{a-\sqrt{a^2-4bc}+2ce^x}\,dx}{\sqrt{a^2-4bc}} - \frac{(2c)\int \frac{e^x x}{a+\sqrt{a^2-4bc}+2ce^x}\,dx}{\sqrt{a^2-4bc}}$$

$$= \frac{x\log\left(1+\frac{2ce^x}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}} - \frac{x\log\left(1+\frac{2ce^x}{a+\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}} - \frac{\int \log\left(1+\frac{2ce^x}{a-\sqrt{a^2-4bc}}\right)dx}{\sqrt{a^2-4bc}} + \frac{\int \log\left(1+\right.}{\sqrt{a^2}}$$

$$= \frac{x\log\left(1+\frac{2ce^x}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}} - \frac{x\log\left(1+\frac{2ce^x}{a+\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}} - \frac{\text{Subst}\left(\int \frac{\log\left(1+\frac{2cx}{a-\sqrt{a^2-4bc}}\right)}{x}\,dx, x, e^x\right)}{\sqrt{a^2-4bc}} + \frac{\text{Su}}{}$$

$$= \frac{x\log\left(1+\frac{2ce^x}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}} - \frac{x\log\left(1+\frac{2ce^x}{a+\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}} + \frac{\text{Li}_2\left(-\frac{2ce^x}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}} - \frac{\text{Li}_2\left(-\frac{2ce^x}{a+\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}}$$

Mathematica [A] time = 0.07, size = 123, normalized size = 0.77

$$\frac{\text{Li}_2\left(\frac{2ce^x}{\sqrt{a^2-4bc}-a}\right) - \text{Li}_2\left(-\frac{2ce^x}{a+\sqrt{a^2-4bc}}\right) + x\left(\log\left(\frac{2ce^x}{a-\sqrt{a^2-4bc}}+1\right) - \log\left(\frac{2ce^x}{\sqrt{a^2-4bc}+a}+1\right)\right)}{\sqrt{a^2-4bc}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x/(a + b/E^x + c*E^x),x]
```

```
[Out] (x*(Log[1 + (2*c*E^x)/(a - Sqrt[a^2 - 4*b*c])] - Log[1 + (2*c*E^x)/(a + Sqr
t[a^2 - 4*b*c])]) + PolyLog[2, (2*c*E^x)/(-a + Sqrt[a^2 - 4*b*c])] - PolyLo
g[2, (-2*c*E^x)/(a + Sqrt[a^2 - 4*b*c])])/Sqrt[a^2 - 4*b*c]
```

fricas [A] time = 0.42, size = 214, normalized size = 1.35

$$\frac{bx\sqrt{\frac{a^2-4\,bc}{b^2}}\,\log\left(\frac{b\sqrt{\frac{a^2-4\,bc}{b^2}}\,e^x+ae^x+2\,b}{2\,b}\right)-bx\sqrt{\frac{a^2-4\,bc}{b^2}}\,\log\left(-\frac{b\sqrt{\frac{a^2-4\,bc}{b^2}}\,e^x-ae^x-2\,b}{2\,b}\right)+b\sqrt{\frac{a^2-4\,bc}{b^2}}\,\mathrm{Li}_2\left(-\frac{b\sqrt{\frac{a^2-4\,bc}{b^2}}\,e^x+ae^x+2\,b}{2\,b}+1\right.}{a^2-4\,bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a+b/exp(x)+c*exp(x)),x, algorithm="fricas")
```

```
[Out] (b*x*sqrt((a^2 - 4*b*c)/b^2)*log(1/2*(b*sqrt((a^2 - 4*b*c)/b^2)*e^x + a*e^x
 + 2*b)/b) - b*x*sqrt((a^2 - 4*b*c)/b^2)*log(-1/2*(b*sqrt((a^2 - 4*b*c)/b^2
)*e^x - a*e^x - 2*b)/b) + b*sqrt((a^2 - 4*b*c)/b^2)*dilog(-1/2*(b*sqrt((a^2
 - 4*b*c)/b^2)*e^x + a*e^x + 2*b)/b + 1) - b*sqrt((a^2 - 4*b*c)/b^2)*dilog(
1/2*(b*sqrt((a^2 - 4*b*c)/b^2)*e^x - a*e^x - 2*b)/b + 1))/(a^2 - 4*b*c)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{be^{(-x)} + ce^x + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a+b/exp(x)+c*exp(x)),x, algorithm="giac")
```

```
[Out] integrate(x/(b*e^(-x) + c*e^x + a), x)
```

maple [A] time = 0.02, size = 180, normalized size = 1.13

$$\frac{\left(\ln\left(\frac{-2c\,\mathrm{e}^x-a+\sqrt{a^2-4bc}}{-a+\sqrt{a^2-4bc}}\right)-\ln\left(\frac{2c\,\mathrm{e}^x+a+\sqrt{a^2-4bc}}{a+\sqrt{a^2-4bc}}\right)\right)x}{\sqrt{a^2-4bc}}+\frac{\mathrm{dilog}\left(\frac{-2c\,\mathrm{e}^x-a+\sqrt{a^2-4bc}}{-a+\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}}-\frac{\mathrm{dilog}\left(\frac{2c\,\mathrm{e}^x+a+\sqrt{a^2-4bc}}{a+\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a+b/exp(x)+c*exp(x)),x)
```

```
[Out] x*(ln((-2*c*exp(x)+(a^2-4*b*c)^(1/2)-a)/(-a+(a^2-4*b*c)^(1/2)))-ln((2*c*exp
(x)+(a^2-4*b*c)^(1/2)+a)/(a+(a^2-4*b*c)^(1/2))))/(a^2-4*b*c)^(1/2)+1/(a^2-4
```

```
*b*c)^(1/2)*dilog((-2*c*exp(x)+(a^2-4*b*c)^(1/2)-a)/(-a+(a^2-4*b*c)^(1/2)))
-1/(a^2-4*b*c)^(1/2)*dilog((2*c*exp(x)+(a^2-4*b*c)^(1/2)+a)/(a+(a^2-4*b*c)^
(1/2)))
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a+b/exp(x)+c*exp(x)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(a^2-4*b*c>0)', see `assume?` for mo
re details)Is a^2-4*b*c positive or negative?
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x}{a + c\,\mathrm{e}^x + b\,\mathrm{e}^{-x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a + c*exp(x) + b*exp(-x)),x)
```

```
[Out] int(x/(a + c*exp(x) + b*exp(-x)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{xe^x}{ae^x + b + ce^{2x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a+b/exp(x)+c*exp(x)),x)
```

```
[Out] Integral(x*exp(x)/(a*exp(x) + b + c*exp(2*x)), x)
```

3.539 $\int \frac{x^2}{a+be^{-x}+ce^x} \, dx$

Optimal. Leaf size=244

$$\frac{2x\text{Li}_2\left(-\frac{2ce^x}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}}-\frac{2x\text{Li}_2\left(-\frac{2ce^x}{a+\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}}-\frac{2\text{Li}_3\left(-\frac{2ce^x}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}}+\frac{2\text{Li}_3\left(-\frac{2ce^x}{a+\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}}+\frac{x^2\log\left(\frac{2ce^x}{a-\sqrt{a^2-4bc}}+1\right)}{\sqrt{a^2-4bc}}-\frac{x^2\text{lo}}{}$$

```
[Out] x^2*ln(1+2*c*exp(x)/(a-(a^2-4*b*c)^(1/2)))/(a^2-4*b*c)^(1/2)-x^2*ln(1+2*c*e
xp(x)/(a+(a^2-4*b*c)^(1/2)))/(a^2-4*b*c)^(1/2)+2*x*polylog(2,-2*c*exp(x)/(a
-(a^2-4*b*c)^(1/2)))/(a^2-4*b*c)^(1/2)-2*x*polylog(2,-2*c*exp(x)/(a+(a^2-4*
b*c)^(1/2)))/(a^2-4*b*c)^(1/2)-2*polylog(3,-2*c*exp(x)/(a-(a^2-4*b*c)^(1/2)
))/(a^2-4*b*c)^(1/2)+2*polylog(3,-2*c*exp(x)/(a+(a^2-4*b*c)^(1/2)))/(a^2-4*
b*c)^(1/2)
```

Rubi [A] time = 0.50, antiderivative size = 244, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 6, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.300, Rules used = {2267, 2264, 2190, 2531, 2282, 6589}

$$\frac{2x\text{PolyLog}\left(2,-\frac{2ce^x}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}}-\frac{2x\text{PolyLog}\left(2,-\frac{2ce^x}{\sqrt{a^2-4bc}+a}\right)}{\sqrt{a^2-4bc}}-\frac{2\text{PolyLog}\left(3,-\frac{2ce^x}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}}+\frac{2\text{PolyLog}\left(3,-\frac{2ce^x}{\sqrt{a^2-4bc}+a}\right)}{\sqrt{a^2-4bc}}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/(a + b/E^x + c*E^x),x]
```

```
[Out] (x^2*Log[1 + (2*c*E^x)/(a - Sqrt[a^2 - 4*b*c])])/Sqrt[a^2 - 4*b*c] - (x^2*L
og[1 + (2*c*E^x)/(a + Sqrt[a^2 - 4*b*c])])/Sqrt[a^2 - 4*b*c] + (2*x*PolyLog
[2, (-2*c*E^x)/(a - Sqrt[a^2 - 4*b*c])])/Sqrt[a^2 - 4*b*c] - (2*x*PolyLog[2
, (-2*c*E^x)/(a + Sqrt[a^2 - 4*b*c])])/Sqrt[a^2 - 4*b*c] - (2*PolyLog[3, (-
2*c*E^x)/(a - Sqrt[a^2 - 4*b*c])])/Sqrt[a^2 - 4*b*c] + (2*PolyLog[3, (-2*c*
E^x)/(a + Sqrt[a^2 - 4*b*c])])/Sqrt[a^2 - 4*b*c]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2264

```
Int[((F_)^(u_)*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F_)^(u_) + (c_.)
*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[(2*c)/q, Int[
```

```
((f + g*x)^m*F^u)/(b - q + 2*c*F^u), x], x] - Dist[(2*c)/q, Int[((f + g*x)^
m*F^u)/(b + q + 2*c*F^u), x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v,
 2*u] && LinearQ[u, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2267

```
Int[(u_)/((a_) + (b_.)*(F_)^(v_) + (c_.)*(F_)^(w_)), x_Symbol] :> Int[(u*F^
v)/(c + a*F^v + b*F^(2*v)), x] /; FreeQ[{F, a, b, c}, x] && EqQ[w, -v] && L
inearQ[v, x] && If[RationalQ[Coefficient[v, x, 1]], GtQ[Coefficient[v, x, 1
], 0], LtQ[LeafCount[v], LeafCount[w]]]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x^2}{a+be^{-x}+ce^x}\,dx = \int \frac{e^x x^2}{b+ae^x+ce^{2x}}\,dx$$
$$= \frac{(2c)\int \frac{e^x x^2}{a-\sqrt{a^2-4bc}+2ce^x}\,dx}{\sqrt{a^2-4bc}} - \frac{(2c)\int \frac{e^x x^2}{a+\sqrt{a^2-4bc}+2ce^x}\,dx}{\sqrt{a^2-4bc}}$$
$$= \frac{x^2\log\left(1+\frac{2ce^x}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}} - \frac{x^2\log\left(1+\frac{2ce^x}{a+\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}} - \frac{2\int x\log\left(1+\frac{2ce^x}{a-\sqrt{a^2-4bc}}\right)dx}{\sqrt{a^2-4bc}} + \frac{2\int x\,\mathrm{lo}}{}$$
$$= \frac{x^2\log\left(1+\frac{2ce^x}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}} - \frac{x^2\log\left(1+\frac{2ce^x}{a+\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}} + \frac{2x\mathrm{Li}_2\left(-\frac{2ce^x}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}} - \frac{2x\mathrm{Li}_2\left(-\frac{2ce^x}{a+\sqrt{a^2-4}}\right.}{\sqrt{a^2-4bc}}$$
$$= \frac{x^2\log\left(1+\frac{2ce^x}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}} - \frac{x^2\log\left(1+\frac{2ce^x}{a+\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}} + \frac{2x\mathrm{Li}_2\left(-\frac{2ce^x}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}} - \frac{2x\mathrm{Li}_2\left(-\frac{2ce^x}{a+\sqrt{a^2-4}}\right.}{\sqrt{a^2-4bc}}$$
$$= \frac{x^2\log\left(1+\frac{2ce^x}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}} - \frac{x^2\log\left(1+\frac{2ce^x}{a+\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}} + \frac{2x\mathrm{Li}_2\left(-\frac{2ce^x}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}} - \frac{2x\mathrm{Li}_2\left(-\frac{2ce^x}{a+\sqrt{a^2-4}}\right.}{\sqrt{a^2-4bc}}$$

Mathematica [A] time = 0.04, size = 185, normalized size = 0.76

$$\frac{2x\mathrm{Li}_2\left(\frac{2ce^x}{\sqrt{a^2-4bc}-a}\right) - 2x\mathrm{Li}_2\left(-\frac{2ce^x}{a+\sqrt{a^2-4bc}}\right) - 2\mathrm{Li}_3\left(\frac{2ce^x}{\sqrt{a^2-4bc}-a}\right) + 2\mathrm{Li}_3\left(-\frac{2ce^x}{a+\sqrt{a^2-4bc}}\right) + x^2\log\left(\frac{2ce^x}{a-\sqrt{a^2-4bc}}+1\right) - x^2\,\mathrm{lo}}{\sqrt{a^2-4bc}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/(a + b/E^x + c*E^x),x]
```

```
[Out] (x^2*Log[1 + (2*c*E^x)/(a - Sqrt[a^2 - 4*b*c])] - x^2*Log[1 + (2*c*E^x)/(a
+ Sqrt[a^2 - 4*b*c])] + 2*x*PolyLog[2, (2*c*E^x)/(-a + Sqrt[a^2 - 4*b*c])]
- 2*x*PolyLog[2, (-2*c*E^x)/(a + Sqrt[a^2 - 4*b*c])] - 2*PolyLog[3, (2*c*E^
x)/(-a + Sqrt[a^2 - 4*b*c])] + 2*PolyLog[3, (-2*c*E^x)/(a + Sqrt[a^2 - 4*b*
c])])/Sqrt[a^2 - 4*b*c]
```

fricas [C] time = 0.43, size = 316, normalized size = 1.30

$$bx^2\sqrt{\frac{a^2-4bc}{b^2}}\log\left(\frac{b\sqrt{\frac{a^2-4bc}{b^2}}e^x+ae^x+2b}{2b}\right) - bx^2\sqrt{\frac{a^2-4bc}{b^2}}\log\left(-\frac{b\sqrt{\frac{a^2-4bc}{b^2}}e^x-ae^x-2b}{2b}\right) + 2bx\sqrt{\frac{a^2-4bc}{b^2}}\mathrm{Li}_2\left(-\frac{b\sqrt{\frac{a^2-4bc}{b^2}}e^x+ae^x+2}{2b}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a+b/exp(x)+c*exp(x)),x, algorithm="fricas")
```

```
[Out] (b*x^2*sqrt((a^2 - 4*b*c)/b^2)*log(1/2*(b*sqrt((a^2 - 4*b*c)/b^2)*e^x + a*e
^x + 2*b)/b) - b*x^2*sqrt((a^2 - 4*b*c)/b^2)*log(-1/2*(b*sqrt((a^2 - 4*b*c)
/b^2)*e^x - a*e^x - 2*b)/b) + 2*b*x*sqrt((a^2 - 4*b*c)/b^2)*dilog(-1/2*(b*s
qrt((a^2 - 4*b*c)/b^2)*e^x + a*e^x + 2*b)/b + 1) - 2*b*x*sqrt((a^2 - 4*b*c)
/b^2)*dilog(1/2*(b*sqrt((a^2 - 4*b*c)/b^2)*e^x - a*e^x - 2*b)/b + 1) - 2*b*
sqrt((a^2 - 4*b*c)/b^2)*polylog(3, -1/2*(b*sqrt((a^2 - 4*b*c)/b^2)*e^x + a*
e^x)/b) + 2*b*sqrt((a^2 - 4*b*c)/b^2)*polylog(3, 1/2*(b*sqrt((a^2 - 4*b*c)/
b^2)*e^x - a*e^x)/b))/(a^2 - 4*b*c)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{be^{(-x)} + ce^x + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a+b/exp(x)+c*exp(x)),x, algorithm="giac")
```

```
[Out] integrate(x^2/(b*e^(-x) + c*e^x + a), x)
```

maple [F] time = 0.03, size = 0, normalized size = 0.00

$$\int \frac{x^2}{b\,\mathrm{e}^{-x} + c\,\mathrm{e}^{x} + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(a+b/exp(x)+c*exp(x)),x)
```

```
[Out] int(x^2/(a+b/exp(x)+c*exp(x)),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a+b/exp(x)+c*exp(x)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(a^2-4*b*c>0)', see `assume?` for mo
re details)Is a^2-4*b*c positive or negative?
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2}{a+c\,\mathrm{e}^x+b\,\mathrm{e}^{-x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(a + c*exp(x) + b*exp(-x)),x)
```

```
[Out] int(x^2/(a + c*exp(x) + b*exp(-x)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2e^x}{ae^x+b+ce^{2x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(a+b/exp(x)+c*exp(x)),x)
```

```
[Out] Integral(x**2*exp(x)/(a*exp(x) + b + c*exp(2*x)), x)
```

3.540 $\int \frac{1}{a+bf^{-c-dx}+cf^{c+dx}}\,dx$

Optimal. Leaf size=47

$$-\frac{2\tanh^{-1}\left(\frac{a+2cf^{c+dx}}{\sqrt{a^2-4bc}}\right)}{d\log(f)\sqrt{a^2-4bc}}$$

```
[Out] -2*arctanh((a+2*c*f^(d*x+c))/(a^2-4*b*c)^(1/2))/d/ln(f)/(a^2-4*b*c)^(1/2)
```

Rubi [A] time = 0.06, antiderivative size = 47, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.160, Rules used = {2282, 1386, 618, 206}

$$-\frac{2\tanh^{-1}\left(\frac{a+2cf^{c+dx}}{\sqrt{a^2-4bc}}\right)}{d\log(f)\sqrt{a^2-4bc}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*f^(-c - d*x) + c*f^(c + d*x))^(-1),x]
```

```
[Out] (-2*ArcTanh[(a + 2*c*f^(c + d*x))/Sqrt[a^2 - 4*b*c]])/(Sqrt[a^2 - 4*b*c]*d*
Log[f])
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 618

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> Dist[-2, Subst[I
nt[1/Simp[b^2 - 4*a*c - x^2, x], x], x, b + 2*c*x], x] /; FreeQ[{a, b, c},
x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 1386

```
Int[(x_)^(m_.)*((a_) + (c_.)*(x_)^(n_.) + (b_.)*(x_)^(mn_))^(p_.), x_Symbol
] :> Int[x^(m - n*p)*(b + a*x^n + c*x^(2*n))^p, x] /; FreeQ[{a, b, c, m, n}
, x] && EqQ[mn, -n] && IntegerQ[p] && PosQ[n]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
```

```
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$
\begin{aligned}
\int \frac{1}{a+bf^{-c-dx}+cf^{c+dx}}\,dx &= \frac{\operatorname{Subst}\left(\int \frac{1}{x\left(a+\frac{b}{x}+cx\right)}\,dx,x,f^{c+dx}\right)}{d\log(f)}\\
&= \frac{\operatorname{Subst}\left(\int \frac{1}{b+ax+cx^2}\,dx,x,f^{c+dx}\right)}{d\log(f)}\\
&= -\frac{2\operatorname{Subst}\left(\int \frac{1}{a^2-4bc-x^2}\,dx,x,a+2cf^{c+dx}\right)}{d\log(f)}\\
&= -\frac{2\tanh^{-1}\left(\frac{a+2cf^{c+dx}}{\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}\,d\log(f)}
\end{aligned}
$$

Mathematica [A] time = 0.06, size = 47, normalized size = 1.00

$$
-\frac{2\tanh^{-1}\left(\frac{a+2cf^{c+dx}}{\sqrt{a^2-4bc}}\right)}{d\log(f)\sqrt{a^2-4bc}}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*f^(-c - d*x) + c*f^(c + d*x))^(-1),x]
```

```
[Out] (-2*ArcTanh[(a + 2*c*f^(c + d*x))/Sqrt[a^2 - 4*b*c]])/(Sqrt[a^2 - 4*b*c]*d*
Log[f])
```

fricas [A] time = 0.45, size = 189, normalized size = 4.02

$$
\left[\frac{\log\left(\frac{2\,c^2 f^{2\,dx+2\,c}+a^2-2\,bc+2\,\left(ac-\sqrt{a^2-4\,bc}\,c\right)f^{dx+c}-\sqrt{a^2-4\,bc}\,a}{cf^{2\,dx+2\,c}+af^{dx+c}+b}\right)}{\sqrt{a^2-4\,bc}\,d\log(f)}, -\frac{2\,\sqrt{-a^2+4\,bc}\,\arctan\left(-\frac{2\,\sqrt{-a^2+4\,bc}\,cf^{dx+c}+\sqrt{-a^2+4\,bc}\,a}{a^2-4\,bc}\right)}{\left(a^2-4\,bc\right)d\log(f)}\right]
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*f^(-d*x-c)+c*f^(d*x+c)),x, algorithm="fricas")
```

```
[Out] [log((2*c^2*f^(2*d*x + 2*c) + a^2 - 2*b*c + 2*(a*c - sqrt(a^2 - 4*b*c)*c)*f
^(d*x + c) - sqrt(a^2 - 4*b*c)*a)/(c*f^(2*d*x + 2*c) + a*f^(d*x + c) + b))/
(sqrt(a^2 - 4*b*c)*d*log(f)), -2*sqrt(-a^2 + 4*b*c)*arctan(-(2*sqrt(-a^2 +
4*b*c)*c*f^(d*x + c) + sqrt(-a^2 + 4*b*c)*a)/(a^2 - 4*b*c))/((a^2 - 4*b*c)*
d*log(f))]
```

giac [A] time = 0.40, size = 48, normalized size = 1.02

$$\frac{2\arctan\left(\frac{2\,cf^{dx}f^{c}+a}{\sqrt{-a^2+4\,bc}}\right)}{\sqrt{-a^2+4\,bc}\,d\log(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*f^(-d*x-c)+c*f^(d*x+c)),x, algorithm="giac")
```

```
[Out] 2*arctan((2*c*f^(d*x)*f^c + a)/sqrt(-a^2 + 4*b*c))/(sqrt(-a^2 + 4*b*c)*d*lo
g(f))
```

maple [B] time = 0.05, size = 135, normalized size = 2.87

$$-\frac{\ln\left(f^{-dx-c}+\frac{-a^2+4bc+\sqrt{a^2-4bc}\,a}{2\sqrt{a^2-4bc}\,b}\right)}{\sqrt{a^2-4bc}\,d\ln(f)}+\frac{\ln\left(f^{-dx-c}+\frac{a^2-4bc+\sqrt{a^2-4bc}\,a}{2\sqrt{a^2-4bc}\,b}\right)}{\sqrt{a^2-4bc}\,d\ln(f)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a+b*f^(-d*x-c)+c*f^(d*x+c)),x)
```

```
[Out] 1/(a^2-4*b*c)^(1/2)/d/ln(f)*ln(f^(-d*x-c)+1/2*(a*(a^2-4*b*c)^(1/2)+a^2-4*b*
c)/b/(a^2-4*b*c)^(1/2))-1/(a^2-4*b*c)^(1/2)/d/ln(f)*ln(f^(-d*x-c)+1/2*(a*(a
^2-4*b*c)^(1/2)-a^2+4*b*c)/b/(a^2-4*b*c)^(1/2))
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*f^(-d*x-c)+c*f^(d*x+c)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*b*c-a^2>0)', see `assume?` for mo
re details)Is 4*b*c-a^2 positive or negative?
```

mupad [B] time = 3.64, size = 47, normalized size = 1.00

$$\frac{2\,\mathrm{atan}\left(\frac{a+2\,c\,f^{c+d\,x}}{\sqrt{4\,b\,c-a^2}}\right)}{d\,\ln(f)\,\sqrt{4\,b\,c-a^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a + c*f^(c + d*x) + b/f^(c + d*x)),x)
```

```
[Out] (2*atan((a + 2*c*f^(c + d*x))/(4*b*c - a^2)^(1/2)))/(d*log(f)*(4*b*c - a^2)
^(1/2))
```

sympy [A] time = 0.38, size = 66, normalized size = 1.40

$$\mathrm{RootSum}\left(z^2\left(a^2d^2\log(f)^2-4bcd^2\log(f)^2\right)-1,\left(i\mapsto i\log\left(f^{c+dx}+\frac{-ia^2d\log(f)+4ibcd\log(f)+a}{2c}\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*f**(-d*x-c)+c*f**(d*x+c)),x)
```

```
[Out] RootSum(_z**2*(a**2*d**2*log(f)**2 - 4*b*c*d**2*log(f)**2) - 1, Lambda(_i,
_i*log(f**(c + d*x) + (-_i*a**2*d*log(f) + 4*_i*b*c*d*log(f) + a)/(2*c))))
```

3.541 $\int \frac{x}{a+bf^{-c-dx}+cf^{c+dx}}\,dx$

Optimal. Leaf size=203

$$\frac{\mathrm{Li}_2\left(-\frac{2cf^{c+dx}}{a-\sqrt{a^2-4bc}}\right)}{d^2\log^2(f)\sqrt{a^2-4bc}}-\frac{\mathrm{Li}_2\left(-\frac{2cf^{c+dx}}{a+\sqrt{a^2-4bc}}\right)}{d^2\log^2(f)\sqrt{a^2-4bc}}+\frac{x\log\left(\frac{2cf^{c+dx}}{a-\sqrt{a^2-4bc}}+1\right)}{d\log(f)\sqrt{a^2-4bc}}-\frac{x\log\left(\frac{2cf^{c+dx}}{\sqrt{a^2-4bc}+a}+1\right)}{d\log(f)\sqrt{a^2-4bc}}$$

```
[Out] x*ln(1+2*c*f^(d*x+c)/(a-(a^2-4*b*c)^(1/2)))/d/ln(f)/(a^2-4*b*c)^(1/2)-x*ln(
1+2*c*f^(d*x+c)/(a+(a^2-4*b*c)^(1/2)))/d/ln(f)/(a^2-4*b*c)^(1/2)+polylog(2,
-2*c*f^(d*x+c)/(a-(a^2-4*b*c)^(1/2)))/d^2/ln(f)^2/(a^2-4*b*c)^(1/2)-polylog
(2,-2*c*f^(d*x+c)/(a+(a^2-4*b*c)^(1/2)))/d^2/ln(f)^2/(a^2-4*b*c)^(1/2)
```

Rubi [A] time = 0.41, antiderivative size = 203, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.185, Rules used = {2267, 2264, 2190, 2279, 2391}

$$\frac{\mathrm{PolyLog}\left(2,-\frac{2cf^{c+dx}}{a-\sqrt{a^2-4bc}}\right)}{d^2\log^2(f)\sqrt{a^2-4bc}}-\frac{\mathrm{PolyLog}\left(2,-\frac{2cf^{c+dx}}{\sqrt{a^2-4bc}+a}\right)}{d^2\log^2(f)\sqrt{a^2-4bc}}+\frac{x\log\left(\frac{2cf^{c+dx}}{a-\sqrt{a^2-4bc}}+1\right)}{d\log(f)\sqrt{a^2-4bc}}-\frac{x\log\left(\frac{2cf^{c+dx}}{\sqrt{a^2-4bc}+a}+1\right)}{d\log(f)\sqrt{a^2-4bc}}$$

Antiderivative was successfully verified.

```
[In] Int[x/(a + b*f^(-c - d*x) + c*f^(c + d*x)),x]
```

```
[Out] (x*Log[1 + (2*c*f^(c + d*x))/(a - Sqrt[a^2 - 4*b*c])])/(Sqrt[a^2 - 4*b*c]*d
*Log[f]) - (x*Log[1 + (2*c*f^(c + d*x))/(a + Sqrt[a^2 - 4*b*c])])/(Sqrt[a^2
 - 4*b*c]*d*Log[f]) + PolyLog[2, (-2*c*f^(c + d*x))/(a - Sqrt[a^2 - 4*b*c])
]/(Sqrt[a^2 - 4*b*c]*d^2*Log[f]^2) - PolyLog[2, (-2*c*f^(c + d*x))/(a + Sqr
t[a^2 - 4*b*c])]/(Sqrt[a^2 - 4*b*c]*d^2*Log[f]^2)
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2264

```
Int[((F_)^(u_)*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F_)^(u_) + (c_.)
*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[(2*c)/q, Int[
((f + g*x)^m*F^u)/(b - q + 2*c*F^u), x], x] - Dist[(2*c)/q, Int[((f + g*x)^
m*F^u)/(b + q + 2*c*F^u), x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v,
```

```
2*u] && LinearQ[u, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2267

```
Int[(u_)/((a_) + (b_.)*(F_)^(v_) + (c_.)*(F_)^(w_)), x_Symbol] :> Int[(u*F^
v)/(c + a*F^v + b*F^(2*v)), x] /; FreeQ[{F, a, b, c}, x] && EqQ[w, -v] && L
inearQ[v, x] && If[RationalQ[Coefficient[v, x, 1]], GtQ[Coefficient[v, x, 1
], 0], LtQ[LeafCount[v], LeafCount[w]]]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x}{a+bf^{-c-dx}+cf^{c+dx}}\,dx = \int \frac{f^{c+dx}x}{b+af^{c+dx}+cf^{2(c+dx)}}\,dx$$

$$= \frac{(2c)\int \frac{f^{c+dx}x}{a-\sqrt{a^2-4bc}+2cf^{c+dx}}\,dx}{\sqrt{a^2-4bc}} - \frac{(2c)\int \frac{f^{c+dx}x}{a+\sqrt{a^2-4bc}+2cf^{c+dx}}\,dx}{\sqrt{a^2-4bc}}$$

$$= \frac{x\log\left(1+\frac{2cf^{c+dx}}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}\,d\log(f)} - \frac{x\log\left(1+\frac{2cf^{c+dx}}{a+\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}\,d\log(f)} - \frac{\int \log\left(1+\frac{2cf^{c+dx}}{a-\sqrt{a^2-4bc}}\right)dx}{\sqrt{a^2-4bc}\,d\log(f)} + \frac{\int \log}{\sqrt{a}}$$

$$= \frac{x\log\left(1+\frac{2cf^{c+dx}}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}\,d\log(f)} - \frac{x\log\left(1+\frac{2cf^{c+dx}}{a+\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}\,d\log(f)} - \frac{\text{Subst}\left(\int \frac{\log\left(1+\frac{2cx}{a-\sqrt{a^2-4bc}}\right)}{x}\,dx, x, f^{c+}\right.}{\sqrt{a^2-4bc}\,d^2\log^2(f)}$$

$$= \frac{x\log\left(1+\frac{2cf^{c+dx}}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}\,d\log(f)} - \frac{x\log\left(1+\frac{2cf^{c+dx}}{a+\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}\,d\log(f)} + \frac{\text{Li}_2\left(-\frac{2cf^{c+dx}}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}\,d^2\log^2(f)} - \frac{\text{Li}_2\left(-\frac{}{a+}\right.}{\sqrt{a^2-4bc}}$$

Mathematica [F] time = 0.46, size = 0, normalized size = 0.00

$$\int \frac{x}{a + bf^{-c-dx} + cf^{c+dx}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x/(a + b*f^(-c - d*x) + c*f^(c + d*x)),x]
```

```
[Out] Integrate[x/(a + b*f^(-c - d*x) + c*f^(c + d*x)), x]
```

fricas [A] time = 0.44, size = 353, normalized size = 1.74

$$bc\sqrt{\frac{a^2-4\,bc}{b^2}}\,\log\left(2\,cf^{dx+c}+b\sqrt{\frac{a^2-4\,bc}{b^2}}+a\right)\log(f)-bc\sqrt{\frac{a^2-4\,bc}{b^2}}\,\log\left(2\,cf^{dx+c}-b\sqrt{\frac{a^2-4\,bc}{b^2}}+a\right)\log(f)+(bdx+b$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a+b*f^(-d*x-c)+c*f^(d*x+c)),x, algorithm="fricas")
```

```
[Out] (b*c*sqrt((a^2 - 4*b*c)/b^2)*log(2*c*f^(d*x + c) + b*sqrt((a^2 - 4*b*c)/b^2
) + a)*log(f) - b*c*sqrt((a^2 - 4*b*c)/b^2)*log(2*c*f^(d*x + c) - b*sqrt((a
^2 - 4*b*c)/b^2) + a)*log(f) + (b*d*x + b*c)*sqrt((a^2 - 4*b*c)/b^2)*log(f)
*log(1/2*((b*sqrt((a^2 - 4*b*c)/b^2) + a)*f^(d*x + c) + 2*b)/b) - (b*d*x +
b*c)*sqrt((a^2 - 4*b*c)/b^2)*log(f)*log(-1/2*((b*sqrt((a^2 - 4*b*c)/b^2) -
a)*f^(d*x + c) - 2*b)/b) + b*sqrt((a^2 - 4*b*c)/b^2)*dilog(-1/2*((b*sqrt((a
^2 - 4*b*c)/b^2) + a)*f^(d*x + c) + 2*b)/b + 1) - b*sqrt((a^2 - 4*b*c)/b^2)
*dilog(1/2*((b*sqrt((a^2 - 4*b*c)/b^2) - a)*f^(d*x + c) - 2*b)/b + 1))/((a^
2 - 4*b*c)*d^2*log(f)^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{cf^{dx+c} + bf^{-dx-c} + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a+b*f^(-d*x-c)+c*f^(d*x+c)),x, algorithm="giac")
```

```
[Out] integrate(x/(c*f^(d*x + c) + b*f^(-d*x - c) + a), x)
```

maple [B] time = 0.09, size = 433, normalized size = 2.13

$$-\frac{x\ln\left(\frac{-2b\,f^{-c}f^{-dx}-a+\sqrt{a^2-4bc}}{-a+\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}\;d\ln(f)}+\frac{x\ln\left(\frac{2b\,f^{-c}f^{-dx}+a+\sqrt{a^2-4bc}}{a+\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}\;d\ln(f)}+\frac{2c\arctan\left(\frac{2b\,f^{-c}f^{-dx}+a}{\sqrt{-a^2+4bc}}\right)}{\sqrt{-a^2+4bc}\;d^2\ln(f)}-\frac{c\ln\left(\frac{-2b\,f^{-c}f^{-dx}-a+\sqrt{a^2-4bc}}{-a+\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}\;d^2\ln(f)}+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a+b*f^(-d*x-c)+c*f^(d*x+c)),x)
```

```
[Out] 1/ln(f)/d/(a^2-4*b*c)^(1/2)*ln((2*b*f^(-c)*f^(-d*x)+(a^2-4*b*c)^(1/2)+a)/(a
+(a^2-4*b*c)^(1/2)))*x-1/ln(f)/d/(a^2-4*b*c)^(1/2)*ln((-2*b*f^(-c)*f^(-d*x)
+(a^2-4*b*c)^(1/2)-a)/(-a+(a^2-4*b*c)^(1/2)))*x+1/ln(f)/d^2/(a^2-4*b*c)^(1/
2)*ln((2*b*f^(-c)*f^(-d*x)+(a^2-4*b*c)^(1/2)+a)/(a+(a^2-4*b*c)^(1/2)))*c-1/
ln(f)/d^2/(a^2-4*b*c)^(1/2)*ln((-2*b*f^(-c)*f^(-d*x)+(a^2-4*b*c)^(1/2)-a)/(
-a+(a^2-4*b*c)^(1/2)))*c+1/ln(f)^2/d^2/(a^2-4*b*c)^(1/2)*dilog((-2*b*f^(-c)
*f^(-d*x)+(a^2-4*b*c)^(1/2)-a)/(-a+(a^2-4*b*c)^(1/2)))-1/ln(f)^2/d^2/(a^2-4
*b*c)^(1/2)*dilog((2*b*f^(-c)*f^(-d*x)+(a^2-4*b*c)^(1/2)+a)/(a+(a^2-4*b*c)^
(1/2)))+2/ln(f)/d^2*c/(-a^2+4*b*c)^(1/2)*arctan((2*b*f^(-c)*f^(-d*x)+a)/(-a
^2+4*b*c)^(1/2))
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a+b*f^(-d*x-c)+c*f^(d*x+c)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(a^2-4*b*c>0)', see `assume?` for mo
re details)Is a^2-4*b*c positive or negative?
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x}{a+c\,f^{c+d\,x}+\frac{b}{f^{c+d\,x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a + c*f^(c + d*x) + b/f^(c + d*x)),x)
```

```
[Out] int(x/(a + c*f^(c + d*x) + b/f^(c + d*x)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a+b*f**(-d*x-c)+c*f**(d*x+c)),x)
```

```
[Out] Timed out
```

3.542 $\int \frac{x^2}{a+bf^{-c-dx}+cf^{c+dx}}\,dx$

Optimal. Leaf size=310

$$-\frac{2\text{Li}_3\left(-\frac{2cf^{c+dx}}{a-\sqrt{a^2-4bc}}\right)}{d^3\log^3(f)\sqrt{a^2-4bc}}+\frac{2\text{Li}_3\left(-\frac{2cf^{c+dx}}{a+\sqrt{a^2-4bc}}\right)}{d^3\log^3(f)\sqrt{a^2-4bc}}+\frac{2x\text{Li}_2\left(-\frac{2cf^{c+dx}}{a-\sqrt{a^2-4bc}}\right)}{d^2\log^2(f)\sqrt{a^2-4bc}}-\frac{2x\text{Li}_2\left(-\frac{2cf^{c+dx}}{a+\sqrt{a^2-4bc}}\right)}{d^2\log^2(f)\sqrt{a^2-4bc}}+\frac{x^2\log\left(\frac{2cf^{c+dx}}{a-\sqrt{a^2-4bc}}\right.}{d\log(f)\sqrt{a^2-4}}$$

```
[Out] x^2*ln(1+2*c*f^(d*x+c)/(a-(a^2-4*b*c)^(1/2)))/d/ln(f)/(a^2-4*b*c)^(1/2)-x^2
*ln(1+2*c*f^(d*x+c)/(a+(a^2-4*b*c)^(1/2)))/d/ln(f)/(a^2-4*b*c)^(1/2)+2*x*po
lylog(2,-2*c*f^(d*x+c)/(a-(a^2-4*b*c)^(1/2)))/d^2/ln(f)^2/(a^2-4*b*c)^(1/2)
-2*x*polylog(2,-2*c*f^(d*x+c)/(a+(a^2-4*b*c)^(1/2)))/d^2/ln(f)^2/(a^2-4*b*c
)^(1/2)-2*polylog(3,-2*c*f^(d*x+c)/(a-(a^2-4*b*c)^(1/2)))/d^3/ln(f)^3/(a^2-
4*b*c)^(1/2)+2*polylog(3,-2*c*f^(d*x+c)/(a+(a^2-4*b*c)^(1/2)))/d^3/ln(f)^3/
(a^2-4*b*c)^(1/2)
```

Rubi [A] time = 0.66, antiderivative size = 310, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 6, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.207, Rules used = {2267, 2264, 2190, 2531, 2282, 6589}

$$\frac{2x\text{PolyLog}\left(2,-\frac{2cf^{c+dx}}{a-\sqrt{a^2-4bc}}\right)}{d^2\log^2(f)\sqrt{a^2-4bc}}-\frac{2x\text{PolyLog}\left(2,-\frac{2cf^{c+dx}}{\sqrt{a^2-4bc}+a}\right)}{d^2\log^2(f)\sqrt{a^2-4bc}}-\frac{2\text{PolyLog}\left(3,-\frac{2cf^{c+dx}}{a-\sqrt{a^2-4bc}}\right)}{d^3\log^3(f)\sqrt{a^2-4bc}}+\frac{2\text{PolyLog}\left(3,-\frac{2cf^{c+dx}}{\sqrt{a^2-4bc}+\right.}{d^3\log^3(f)\sqrt{a^2-4bc}}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/(a + b*f^(-c - d*x) + c*f^(c + d*x)),x]
```

```
[Out] (x^2*Log[1 + (2*c*f^(c + d*x))/(a - Sqrt[a^2 - 4*b*c])])/(Sqrt[a^2 - 4*b*c]
*d*Log[f]) - (x^2*Log[1 + (2*c*f^(c + d*x))/(a + Sqrt[a^2 - 4*b*c])])/(Sqrt
[a^2 - 4*b*c]*d*Log[f]) + (2*x*PolyLog[2, (-2*c*f^(c + d*x))/(a - Sqrt[a^2
- 4*b*c])])/(Sqrt[a^2 - 4*b*c]*d^2*Log[f]^2) - (2*x*PolyLog[2, (-2*c*f^(c +
 d*x))/(a + Sqrt[a^2 - 4*b*c])])/(Sqrt[a^2 - 4*b*c]*d^2*Log[f]^2) - (2*Poly
Log[3, (-2*c*f^(c + d*x))/(a - Sqrt[a^2 - 4*b*c])])/(Sqrt[a^2 - 4*b*c]*d^3*
Log[f]^3) + (2*PolyLog[3, (-2*c*f^(c + d*x))/(a + Sqrt[a^2 - 4*b*c])])/(Sqr
t[a^2 - 4*b*c]*d^3*Log[f]^3)
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2264

```
Int[((F_)^(u_)*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F_)^(u_) + (c_.)
*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[(2*c)/q, Int[
((f + g*x)^m*F^u)/(b - q + 2*c*F^u), x], x] - Dist[(2*c)/q, Int[((f + g*x)^
m*F^u)/(b + q + 2*c*F^u), x], x]] /; FreeQ[{F, a, b, c, f, g}, x] && EqQ[v,
 2*u] && LinearQ[u, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2267

```
Int[(u_)/((a_) + (b_.)*(F_)^(v_) + (c_.)*(F_)^(w_)), x_Symbol] :> Int[(u*F^
v)/(c + a*F^v + b*F^(2*v)), x] /; FreeQ[{F, a, b, c}, x] && EqQ[w, -v] && L
inearQ[v, x] && If[RationalQ[Coefficient[v, x, 1]], GtQ[Coefficient[v, x, 1
], 0], LtQ[LeafCount[v], LeafCount[w]]]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x^2}{a+bf^{-c-dx}+cf^{c+dx}}\,dx = \int \frac{f^{c+dx}x^2}{b+af^{c+dx}+cf^{2(c+dx)}}\,dx$$

$$= \frac{(2c)\int \frac{f^{c+dx}x^2}{a-\sqrt{a^2-4bc}+2cf^{c+dx}}\,dx}{\sqrt{a^2-4bc}} - \frac{(2c)\int \frac{f^{c+dx}x^2}{a+\sqrt{a^2-4bc}+2cf^{c+dx}}\,dx}{\sqrt{a^2-4bc}}$$

$$= \frac{x^2\log\left(1+\frac{2cf^{c+dx}}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}\,d\log(f)} - \frac{x^2\log\left(1+\frac{2cf^{c+dx}}{a+\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}\,d\log(f)} - \frac{2\int x\log\left(1+\frac{2cf^{c+dx}}{a-\sqrt{a^2-4bc}}\right)dx}{\sqrt{a^2-4bc}\,d\log(f)} +$$

$$= \frac{x^2\log\left(1+\frac{2cf^{c+dx}}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}\,d\log(f)} - \frac{x^2\log\left(1+\frac{2cf^{c+dx}}{a+\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}\,d\log(f)} + \frac{2x\operatorname{Li}_2\left(-\frac{2cf^{c+dx}}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}\,d^2\log^2(f)} - \frac{2x\operatorname{Li}_2}{\sqrt{a^2-}}$$

$$= \frac{x^2\log\left(1+\frac{2cf^{c+dx}}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}\,d\log(f)} - \frac{x^2\log\left(1+\frac{2cf^{c+dx}}{a+\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}\,d\log(f)} + \frac{2x\operatorname{Li}_2\left(-\frac{2cf^{c+dx}}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}\,d^2\log^2(f)} - \frac{2x\operatorname{Li}_2}{\sqrt{a^2-}}$$

$$= \frac{x^2\log\left(1+\frac{2cf^{c+dx}}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}\,d\log(f)} - \frac{x^2\log\left(1+\frac{2cf^{c+dx}}{a+\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}\,d\log(f)} + \frac{2x\operatorname{Li}_2\left(-\frac{2cf^{c+dx}}{a-\sqrt{a^2-4bc}}\right)}{\sqrt{a^2-4bc}\,d^2\log^2(f)} - \frac{2x\operatorname{Li}_2}{\sqrt{a^2-}}$$

Mathematica [F] time = 0.20, size = 0, normalized size = 0.00

$$\int \frac{x^2}{a+bf^{-c-dx}+cf^{c+dx}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^2/(a + b*f^(-c - d*x) + c*f^(c + d*x)),x]
[Out] Integrate[x^2/(a + b*f^(-c - d*x) + c*f^(c + d*x)), x]
```

fricas [C] time = 0.44, size = 489, normalized size = 1.58

$$-\frac{bc^2\sqrt{\frac{a^2-4\,bc}{b^2}}\,\log\left(2\,cf^{dx+c}+b\sqrt{\frac{a^2-4\,bc}{b^2}}+a\right)\log(f)^2 - bc^2\sqrt{\frac{a^2-4\,bc}{b^2}}\,\log\left(2\,cf^{dx+c}-b\sqrt{\frac{a^2-4\,bc}{b^2}}+a\right)\log(f)^2 - 2\,b}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a+b*f^(-d*x-c)+c*f^(d*x+c)),x, algorithm="fricas")
```

```
[Out] -(b*c^2*sqrt((a^2 - 4*b*c)/b^2)*log(2*c*f^(d*x + c) + b*sqrt((a^2 - 4*b*c)/
b^2) + a)*log(f)^2 - b*c^2*sqrt((a^2 - 4*b*c)/b^2)*log(2*c*f^(d*x + c) - b*
sqrt((a^2 - 4*b*c)/b^2) + a)*log(f)^2 - 2*b*d*x*sqrt((a^2 - 4*b*c)/b^2)*dil
og(-1/2*((b*sqrt((a^2 - 4*b*c)/b^2) + a)*f^(d*x + c) + 2*b)/b + 1)*log(f) +
 2*b*d*x*sqrt((a^2 - 4*b*c)/b^2)*dilog(1/2*((b*sqrt((a^2 - 4*b*c)/b^2) - a)
*f^(d*x + c) - 2*b)/b + 1)*log(f) - (b*d^2*x^2 - b*c^2)*sqrt((a^2 - 4*b*c)/
b^2)*log(f)^2*log(1/2*((b*sqrt((a^2 - 4*b*c)/b^2) + a)*f^(d*x + c) + 2*b)/b
) + (b*d^2*x^2 - b*c^2)*sqrt((a^2 - 4*b*c)/b^2)*log(f)^2*log(-1/2*((b*sqrt(
(a^2 - 4*b*c)/b^2) - a)*f^(d*x + c) - 2*b)/b) + 2*b*sqrt((a^2 - 4*b*c)/b^2)
*polylog(3, -1/2*(b*sqrt((a^2 - 4*b*c)/b^2) + a)*f^(d*x + c)/b) - 2*b*sqrt(
(a^2 - 4*b*c)/b^2)*polylog(3, 1/2*(b*sqrt((a^2 - 4*b*c)/b^2) - a)*f^(d*x +
c)/b))/((a^2 - 4*b*c)*d^3*log(f)^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{cf^{dx+c} + bf^{-dx-c} + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a+b*f^(-d*x-c)+c*f^(d*x+c)),x, algorithm="giac")
```

```
[Out] integrate(x^2/(c*f^(d*x + c) + b*f^(-d*x - c) + a), x)
```

maple [F] time = 0.16, size = 0, normalized size = 0.00

$$\int \frac{x^2}{b\,f^{-dx-c} + c\,f^{dx+c} + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(a+b*f^(-d*x-c)+c*f^(d*x+c)),x)
```

```
[Out] int(x^2/(a+b*f^(-d*x-c)+c*f^(d*x+c)),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a+b*f^(-d*x-c)+c*f^(d*x+c)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(a^2-4*b*c>0)', see `assume?` for mo
re details)Is a^2-4*b*c positive or negative?
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2}{a + c\,f^{c+d\,x} + \frac{b}{f^{c+d\,x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(a + c*f^(c + d*x) + b/f^(c + d*x)),x)
```

```
[Out] int(x^2/(a + c*f^(c + d*x) + b/f^(c + d*x)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(a+b*f**(-d*x-c)+c*f**(d*x+c)),x)
```

```
[Out] Timed out
```

3.543 $\int \frac{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\right)^n}{df+(ef+dg)x+egx^2}\,dx$

Optimal. Leaf size=53

$$\text{Int}\left(\frac{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\right)^n}{x(dg+ef)+df+egx^2},x\right)$$

```
[Out] Unintegrable((a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))^n/(d*f+(d*g+e*f)*x+e*g
*x^2),x)
```

Rubi [A] time = 0.15, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\right)^n}{df+(ef+dg)x+egx^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a + b*F^((c*Sqrt[d + e*x])/Sqrt[f + g*x]))^n/(d*f + (e*f + d*g)*x + e*
g*x^2),x]
```

```
[Out] Defer[Int][(a + b*F^((c*Sqrt[d + e*x])/Sqrt[f + g*x]))^n/(d*f + (e*f + d*g)
*x + e*g*x^2), x]
```

Rubi steps

$$\int \frac{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\right)^n}{df+(ef+dg)x+egx^2}\,dx=\int \frac{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\right)^n}{df+(ef+dg)x+egx^2}\,dx$$

Mathematica [A] time = 0.68, size = 0, normalized size = 0.00

$$\int \frac{\left(a + bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\right)^n}{df + (ef + dg)x + egx^2} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a + b*F^((c*Sqrt[d + e*x])/Sqrt[f + g*x]))^n/(d*f + (e*f + d*g)*
x + e*g*x^2),x]
```

```
[Out] Integrate[(a + b*F^((c*Sqrt[d + e*x])/Sqrt[f + g*x]))^n/(d*f + (e*f + d*g)*
x + e*g*x^2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))^n/(d*f+(d*g+e*f)*x+e*g*x^
2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   alglo
gextint: unimplemented
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(F^{\frac{\sqrt{ex+d}\,c}{\sqrt{gx+f}}}b + a\right)^n}{egx^2 + df + \left(ef + dg\right)x} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))^n/(d*f+(d*g+e*f)*x+e*g*x^
2),x, algorithm="giac")
```

```
[Out] integrate((F^(sqrt(e*x + d)*c/sqrt(g*x + f))*b + a)^n/(e*g*x^2 + d*f + (e*f
 + d*g)*x), x)
```

maple [A] time = 0.17, size = 0, normalized size = 0.00

$$\int \frac{\left(b\,F^{\frac{\sqrt{ex+d}\;c}{\sqrt{gx+f}}} + a\right)^n}{eg\,x^2 + df + \left(dg + ef\right)x} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))^n/(d*f+(d*g+e*f)*x+e*g*x^2),x)
```

```
[Out] int((a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))^n/(d*f+(d*g+e*f)*x+e*g*x^2),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(F^{\frac{\sqrt{ex+d}\,c}{\sqrt{gx+f}}}b+a\right)^{n}}{egx^{2}+df+\left(ef+dg\right)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))^n/(d*f+(d*g+e*f)*x+e*g*x^
2),x, algorithm="maxima")
```

```
[Out] integrate((F^(sqrt(e*x + d)*c/sqrt(g*x + f))*b + a)^n/(e*g*x^2 + d*f + (e*f
 + d*g)*x), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{\left(a+F^{\frac{c\,\sqrt{d+e\,x}}{\sqrt{f+g\,x}}}\,b\right)^{n}}{e\,g\,x^{2}+\left(d\,g+e\,f\right)\,x+d\,f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + F^((c*(d + e*x)^(1/2))/(f + g*x)^(1/2))*b)^n/(d*f + x*(d*g + e*f)
+ e*g*x^2),x)
```

```
[Out] int((a + F^((c*(d + e*x)^(1/2))/(f + g*x)^(1/2))*b)^n/(d*f + x*(d*g + e*f)
+ e*g*x^2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F**(c*(e*x+d)**(1/2)/(g*x+f)**(1/2)))**n/(d*f+(d*g+e*f)*x+e*
g*x**2),x)
```

```
[Out] Timed out
```

3.544 $\int \frac{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\right)^3}{df+(ef+dg)x+egx^2}\,dx$

Optimal. Leaf size=154

$$\frac{2a^3\log\left(\frac{\sqrt{d+ex}}{\sqrt{f+gx}}\right)}{ef-dg}+\frac{6a^2b\text{Ei}\left(\frac{c\sqrt{d+ex}\log(F)}{\sqrt{f+gx}}\right)}{ef-dg}+\frac{6ab^2\text{Ei}\left(\frac{2c\sqrt{d+ex}\log(F)}{\sqrt{f+gx}}\right)}{ef-dg}+\frac{2b^3\text{Ei}\left(\frac{3c\sqrt{d+ex}\log(F)}{\sqrt{f+gx}}\right)}{ef-dg}$$

```
[Out] 6*a^2*b*Ei(c*ln(F)*(e*x+d)^(1/2)/(g*x+f)^(1/2))/(-d*g+e*f)+6*a*b^2*Ei(2*c*l
n(F)*(e*x+d)^(1/2)/(g*x+f)^(1/2))/(-d*g+e*f)+2*b^3*Ei(3*c*ln(F)*(e*x+d)^(1/
2)/(g*x+f)^(1/2))/(-d*g+e*f)+2*a^3*ln((e*x+d)^(1/2)/(g*x+f)^(1/2))/(-d*g+e*
f)
```

Rubi [A] time = 0.26, antiderivative size = 154, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 3, integrand size = 50, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.060, Rules used = {2290, 2183, 2178}

$$\frac{6a^2b\text{Ei}\left(\frac{c\sqrt{d+ex}\log(F)}{\sqrt{f+gx}}\right)}{ef-dg}+\frac{2a^3\log\left(\frac{\sqrt{d+ex}}{\sqrt{f+gx}}\right)}{ef-dg}+\frac{6ab^2\text{Ei}\left(\frac{2c\sqrt{d+ex}\log(F)}{\sqrt{f+gx}}\right)}{ef-dg}+\frac{2b^3\text{Ei}\left(\frac{3c\sqrt{d+ex}\log(F)}{\sqrt{f+gx}}\right)}{ef-dg}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*F^((c*Sqrt[d + e*x])/Sqrt[f + g*x]))^3/(d*f + (e*f + d*g)*x + e*
g*x^2),x]
```

```
[Out] (6*a^2*b*ExpIntegralEi[(c*Sqrt[d + e*x]*Log[F])/Sqrt[f + g*x]])/(e*f - d*g)
 + (6*a*b^2*ExpIntegralEi[(2*c*Sqrt[d + e*x]*Log[F])/Sqrt[f + g*x]])/(e*f -
 d*g) + (2*b^3*ExpIntegralEi[(3*c*Sqrt[d + e*x]*Log[F])/Sqrt[f + g*x]])/(e*
f - d*g) + (2*a^3*Log[Sqrt[d + e*x]/Sqrt[f + g*x]])/(e*f - d*g)
```

Rule 2178

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - (c*f)/d))*ExpIntegralEi[(f*g*(c + d*x)*Log[F])/d])/d, x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2183

```
Int[((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.))^(p_.)*((c_.) +
 (d_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c + d*x)^m, (a + b*(F
```

```
^(g*(e + f*x)))^n)^p, x], x] /; FreeQ[{F, a, b, c, d, e, f, g, m, n}, x] &&
 IGtQ[p, 0]
```

Rule 2290

```
Int[((a_.) + (b_.)*(F_)^(((c_.)*Sqrt[(d_.) + (e_.)*(x_)])/Sqrt[(f_.) + (g_.
)*(x_)]))^(n_.)/((A_.) + (B_.)*(x_) + (C_.)*(x_)^2), x_Symbol] :> Dist[(2*e
*g)/(C*(e*f - d*g)), Subst[Int[(a + b*F^(c*x))^n/x, x], x, Sqrt[d + e*x]/Sq
rt[f + g*x]], x] /; FreeQ[{a, b, c, d, e, f, g, A, B, C, F}, x] && EqQ[C*d*
f - A*e*g, 0] && EqQ[B*e*g - C*(e*f + d*g), 0] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\right)^3}{df+(ef+dg)x+egx^2}\,dx = \frac{2\,\text{Subst}\left(\int \frac{(a+bF^{cx})^3}{x}\,dx, x, \frac{\sqrt{d+ex}}{\sqrt{f+gx}}\right)}{ef-dg}$$

$$= \frac{2\,\text{Subst}\left(\int \left(\frac{a^3}{x}+\frac{3a^2bF^{cx}}{x}+\frac{3ab^2F^{2cx}}{x}+\frac{b^3F^{3cx}}{x}\right)dx, x, \frac{\sqrt{d+ex}}{\sqrt{f+gx}}\right)}{ef-dg}$$

$$= \frac{2a^3\log\left(\frac{\sqrt{d+ex}}{\sqrt{f+gx}}\right)}{ef-dg}+\frac{\left(6a^2b\right)\text{Subst}\left(\int \frac{F^{cx}}{x}\,dx, x, \frac{\sqrt{d+ex}}{\sqrt{f+gx}}\right)}{ef-dg}+\frac{\left(6ab^2\right)\text{Subst}\left(\int \frac{F^{2cx}}{x}\,dx,\right.}{ef-dg}$$

$$= \frac{6a^2b\text{Ei}\left(\frac{c\sqrt{d+ex}\log(F)}{\sqrt{f+gx}}\right)}{ef-dg}+\frac{6ab^2\text{Ei}\left(\frac{2c\sqrt{d+ex}\log(F)}{\sqrt{f+gx}}\right)}{ef-dg}+\frac{2b^3\text{Ei}\left(\frac{3c\sqrt{d+ex}\log(F)}{\sqrt{f+gx}}\right)}{ef-dg}+\frac{2a^3\text{lo}}{e}$$

Mathematica [F] time = 1.64, size = 0, normalized size = 0.00

$$\int \frac{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\right)^3}{df+(ef+dg)x+egx^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a + b*F^((c*Sqrt[d + e*x])/Sqrt[f + g*x]))^3/(d*f + (e*f + d*g)*
x + e*g*x^2),x]
```

```
[Out] Integrate[(a + b*F^((c*Sqrt[d + e*x])/Sqrt[f + g*x]))^3/(d*f + (e*f + d*g)*
x + e*g*x^2), x]
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))^3/(d*f+(d*g+e*f)*x+e*g*x^
2),x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(F^{\frac{\sqrt{ex+d}\,c}{\sqrt{gx+f}}}b+a\right)^{3}}{egx^{2}+df+\left(ef+dg\right)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))^3/(d*f+(d*g+e*f)*x+e*g*x^
2),x, algorithm="giac")
```

```
[Out] integrate((F^(sqrt(e*x + d)*c/sqrt(g*x + f))*b + a)^3/(e*g*x^2 + d*f + (e*f
 + d*g)*x), x)
```

maple [F] time = 0.15, size = 0, normalized size = 0.00

$$\int \frac{\left(b\,F^{\frac{\sqrt{ex+d}\,c}{\sqrt{gx+f}}}+a\right)^{3}}{eg\,x^{2}+df+\left(dg+ef\right)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*F^((e*x+d)^(1/2)/(g*x+f)^(1/2)*c)+a)^3/(e*g*x^2+d*f+(d*g+e*f)*x),x)
```

```
[Out] int((b*F^((e*x+d)^(1/2)/(g*x+f)^(1/2)*c)+a)^3/(e*g*x^2+d*f+(d*g+e*f)*x),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$a^{3}\left(\frac{\log\left(ex+d\right)}{ef-dg}-\frac{\log\left(gx+f\right)}{ef-dg}\right)+b^{3}\int \frac{F^{\frac{3\,\sqrt{ex+d}\,c}{\sqrt{gx+f}}}}{egx^{2}+df+\left(ef+dg\right)x}\,dx+3\,ab^{2}\int \frac{F^{\frac{2\,\sqrt{ex+d}\,c}{\sqrt{gx+f}}}}{egx^{2}+df+\left(ef+dg\right)x}\,dx+3\,a^{2}b$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))^3/(d*f+(d*g+e*f)*x+e*g*x^
2),x, algorithm="maxima")
```

```
[Out] a^3*(log(e*x + d)/(e*f - d*g) - log(g*x + f)/(e*f - d*g)) + b^3*integrate(F
^(3*sqrt(e*x + d)*c/sqrt(g*x + f))/(e*g*x^2 + d*f + (e*f + d*g)*x), x) + 3*
a*b^2*integrate(F^(2*sqrt(e*x + d)*c/sqrt(g*x + f))/(e*g*x^2 + d*f + (e*f +
 d*g)*x), x) + 3*a^2*b*integrate(F^(sqrt(e*x + d)*c/sqrt(g*x + f))/(e*g*x^2
 + d*f + (e*f + d*g)*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(a+F^{\frac{c\,\sqrt{d+e\,x}}{\sqrt{f+g\,x}}}\,b\right)^3}{e\,g\,x^2+\left(d\,g+e\,f\right)\,x+d\,f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + F^((c*(d + e*x)^(1/2))/(f + g*x)^(1/2))*b)^3/(d*f + x*(d*g + e*f)
+ e*g*x^2),x)
```

```
[Out] int((a + F^((c*(d + e*x)^(1/2))/(f + g*x)^(1/2))*b)^3/(d*f + x*(d*g + e*f)
+ e*g*x^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(F^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}b+a\right)^3}{(d+ex)\left(f+gx\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F**(c*(e*x+d)**(1/2)/(g*x+f)**(1/2)))**3/(d*f+(d*g+e*f)*x+e*
g*x**2),x)
```

```
[Out] Integral((F**(c*sqrt(d + e*x)/sqrt(f + g*x))*b + a)**3/((d + e*x)*(f + g*x)
), x)
```

3.545 $\int \frac{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\right)^2}{df+(ef+dg)x+egx^2}\,dx$

Optimal. Leaf size=112

$$\frac{2a^2\log\left(\frac{\sqrt{d+ex}}{\sqrt{f+gx}}\right)}{ef-dg}+\frac{4ab\text{Ei}\left(\frac{c\sqrt{d+ex}\log(F)}{\sqrt{f+gx}}\right)}{ef-dg}+\frac{2b^2\text{Ei}\left(\frac{2c\sqrt{d+ex}\log(F)}{\sqrt{f+gx}}\right)}{ef-dg}$$

```
[Out] 4*a*b*Ei(c*ln(F)*(e*x+d)^(1/2)/(g*x+f)^(1/2))/(-d*g+e*f)+2*b^2*Ei(2*c*ln(F)
*(e*x+d)^(1/2)/(g*x+f)^(1/2))/(-d*g+e*f)+2*a^2*ln((e*x+d)^(1/2)/(g*x+f)^(1/
2))/(-d*g+e*f)
```

Rubi [A] time = 0.23, antiderivative size = 112, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, integrand size = 50, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.060, Rules used = {2290, 2183, 2178}

$$\frac{2a^2\log\left(\frac{\sqrt{d+ex}}{\sqrt{f+gx}}\right)}{ef-dg}+\frac{4ab\text{Ei}\left(\frac{c\sqrt{d+ex}\log(F)}{\sqrt{f+gx}}\right)}{ef-dg}+\frac{2b^2\text{Ei}\left(\frac{2c\sqrt{d+ex}\log(F)}{\sqrt{f+gx}}\right)}{ef-dg}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*F^((c*Sqrt[d + e*x])/Sqrt[f + g*x]))^2/(d*f + (e*f + d*g)*x + e*
g*x^2),x]
```

```
[Out] (4*a*b*ExpIntegralEi[(c*Sqrt[d + e*x]*Log[F])/Sqrt[f + g*x]])/(e*f - d*g) +
 (2*b^2*ExpIntegralEi[(2*c*Sqrt[d + e*x]*Log[F])/Sqrt[f + g*x]])/(e*f - d*g
) + (2*a^2*Log[Sqrt[d + e*x]/Sqrt[f + g*x]])/(e*f - d*g)
```

Rule 2178

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - (c*f)/d))*ExpIntegralEi[(f*g*(c + d*x)*Log[F])/d])/d, x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2183

```
Int[((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.))^(p_.)*((c_.) +
 (d_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c + d*x)^m, (a + b*(F
^(g*(e + f*x)))^n)^p, x], x] /; FreeQ[{F, a, b, c, d, e, f, g, m, n}, x] &&
 IGtQ[p, 0]
```

Rule 2290

```
Int[((a_.) + (b_.)*(F_)^(((c_.)*Sqrt[(d_.) + (e_.)*(x_)])/Sqrt[(f_.) + (g_.
)*(x_)]))^(n_.)/((A_.) + (B_.)*(x_) + (C_.)*(x_)^2), x_Symbol] :> Dist[(2*e
*g)/(C*(e*f - d*g)), Subst[Int[(a + b*F^(c*x))^n/x, x], x, Sqrt[d + e*x]/Sq
rt[f + g*x]], x] /; FreeQ[{a, b, c, d, e, f, g, A, B, C, F}, x] && EqQ[C*d*
f - A*e*g, 0] && EqQ[B*e*g - C*(e*f + d*g), 0] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\right)^2}{df+(ef+dg)x+egx^2}\,dx = \frac{2\,\mathrm{Subst}\left(\int \frac{(a+bF^{cx})^2}{x}\,dx, x, \frac{\sqrt{d+ex}}{\sqrt{f+gx}}\right)}{ef-dg}$$

$$= \frac{2\,\mathrm{Subst}\left(\int \left(\frac{a^2}{x}+\frac{2abF^{cx}}{x}+\frac{b^2F^{2cx}}{x}\right) dx, x, \frac{\sqrt{d+ex}}{\sqrt{f+gx}}\right)}{ef-dg}$$

$$= \frac{2a^2\log\left(\frac{\sqrt{d+ex}}{\sqrt{f+gx}}\right)}{ef-dg} + \frac{(4ab)\,\mathrm{Subst}\left(\int \frac{F^{cx}}{x}\,dx, x, \frac{\sqrt{d+ex}}{\sqrt{f+gx}}\right)}{ef-dg} + \frac{\left(2b^2\right)\mathrm{Subst}\left(\int \frac{F^{2cx}}{x}\,dx, x,\right.}{ef-dg}$$

$$= \frac{4ab\,\mathrm{Ei}\left(\frac{c\sqrt{d+ex}\,\log(F)}{\sqrt{f+gx}}\right)}{ef-dg} + \frac{2b^2\,\mathrm{Ei}\left(\frac{2c\sqrt{d+ex}\,\log(F)}{\sqrt{f+gx}}\right)}{ef-dg} + \frac{2a^2\log\left(\frac{\sqrt{d+ex}}{\sqrt{f+gx}}\right)}{ef-dg}$$

Mathematica [F] time = 1.39, size = 0, normalized size = 0.00

$$\int \frac{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\right)^2}{df+(ef+dg)x+egx^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a + b*F^((c*Sqrt[d + e*x])/Sqrt[f + g*x]))^2/(d*f + (e*f + d*g)*
x + e*g*x^2),x]
```

```
[Out] Integrate[(a + b*F^((c*Sqrt[d + e*x])/Sqrt[f + g*x]))^2/(d*f + (e*f + d*g)*
x + e*g*x^2), x]
```

fricas [F] time = 130.85, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{2\,F^{\frac{\sqrt{ex+d}\,c}{\sqrt{gx+f}}}ab+F^{\frac{2\,\sqrt{ex+d}\,c}{\sqrt{gx+f}}}b^2+a^2}{egx^2+df+\left(ef+dg\right)x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))^2/(d*f+(d*g+e*f)*x+e*g*x^
2),x, algorithm="fricas")
```

```
[Out] integral((2*F^(sqrt(e*x + d)*c/sqrt(g*x + f))*a*b + F^(2*sqrt(e*x + d)*c/sq
rt(g*x + f))*b^2 + a^2)/(e*g*x^2 + d*f + (e*f + d*g)*x), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(F^{\frac{\sqrt{ex+d}\,c}{\sqrt{gx+f}}}b+a\right)^2}{egx^2+df+\left(ef+dg\right)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))^2/(d*f+(d*g+e*f)*x+e*g*x^
2),x, algorithm="giac")
```

```
[Out] integrate((F^(sqrt(e*x + d)*c/sqrt(g*x + f))*b + a)^2/(e*g*x^2 + d*f + (e*f
 + d*g)*x), x)
```

maple [F] time = 0.15, size = 0, normalized size = 0.00

$$\int\frac{\left(b\,F^{\frac{\sqrt{ex+d}\,c}{\sqrt{gx+f}}}+a\right)^2}{eg\,x^2+df+\left(dg+ef\right)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*F^((e*x+d)^(1/2)/(g*x+f)^(1/2)*c)+a)^2/(e*g*x^2+d*f+(d*g+e*f)*x),x)
```

```
[Out] int((b*F^((e*x+d)^(1/2)/(g*x+f)^(1/2)*c)+a)^2/(e*g*x^2+d*f+(d*g+e*f)*x),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$a^2\left(\frac{\log\left(ex+d\right)}{ef-dg}-\frac{\log\left(gx+f\right)}{ef-dg}\right)+b^2\int\frac{F^{\frac{2\,\sqrt{ex+d}\,c}{\sqrt{gx+f}}}}{egx^2+df+\left(ef+dg\right)x}\,dx+2\,ab\int\frac{F^{\frac{\sqrt{ex+d}\,c}{\sqrt{gx+f}}}}{egx^2+df+\left(ef+dg\right)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))^2/(d*f+(d*g+e*f)*x+e*g*x^
2),x, algorithm="maxima")
```

```
[Out] a^2*(log(e*x + d)/(e*f - d*g) - log(g*x + f)/(e*f - d*g)) + b^2*integrate(F
^(2*sqrt(e*x + d)*c/sqrt(g*x + f))/(e*g*x^2 + d*f + (e*f + d*g)*x), x) + 2*
a*b*integrate(F^(sqrt(e*x + d)*c/sqrt(g*x + f))/(e*g*x^2 + d*f + (e*f + d*g
)*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(a+F^{\frac{c\,\sqrt{d+e\,x}}{\sqrt{f+g\,x}}}\,b\right)^2}{e\,g\,x^2+\left(d\,g+e\,f\right)\,x+d\,f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + F^((c*(d + e*x)^(1/2))/(f + g*x)^(1/2))*b)^2/(d*f + x*(d*g + e*f)
+ e*g*x^2),x)
```

```
[Out] int((a + F^((c*(d + e*x)^(1/2))/(f + g*x)^(1/2))*b)^2/(d*f + x*(d*g + e*f)
+ e*g*x^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(F^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}b+a\right)^2}{(d+ex)\left(f+gx\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F**(c*(e*x+d)**(1/2)/(g*x+f)**(1/2)))**2/(d*f+(d*g+e*f)*x+e*
g*x**2),x)
```

```
[Out] Integral((F**(c*sqrt(d + e*x)/sqrt(f + g*x))*b + a)**2/((d + e*x)*(f + g*x)
), x)
```

3.546 $\int \frac{a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}}{df+(ef+dg)x+egx^2}\,dx$

Optimal. Leaf size=70

$$\frac{2a\log\left(\frac{\sqrt{d+ex}}{\sqrt{f+gx}}\right)}{ef-dg}+\frac{2b\text{Ei}\left(\frac{c\sqrt{d+ex}\log(F)}{\sqrt{f+gx}}\right)}{ef-dg}$$

```
[Out] 2*b*Ei(c*ln(F)*(e*x+d)^(1/2)/(g*x+f)^(1/2))/(-d*g+e*f)+2*a*ln((e*x+d)^(1/2)
/(g*x+f)^(1/2))/(-d*g+e*f)
```

Rubi [A] time = 0.12, antiderivative size = 70, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 48, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.062, Rules used = {2290, 14, 2178}

$$\frac{2a\log\left(\frac{\sqrt{d+ex}}{\sqrt{f+gx}}\right)}{ef-dg}+\frac{2b\text{Ei}\left(\frac{c\sqrt{d+ex}\log(F)}{\sqrt{f+gx}}\right)}{ef-dg}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*F^((c*Sqrt[d + e*x])/Sqrt[f + g*x]))/(d*f + (e*f + d*g)*x + e*g*
x^2),x]
```

```
[Out] (2*b*ExpIntegralEi[(c*Sqrt[d + e*x]*Log[F])/Sqrt[f + g*x]])/(e*f - d*g) + (
2*a*Log[Sqrt[d + e*x]/Sqrt[f + g*x]])/(e*f - d*g)
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2178

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - (c*f)/d))*ExpIntegralEi[(f*g*(c + d*x)*Log[F])/d])/d, x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2290

```
Int[((a_.) + (b_.)*(F_)^(((c_.)*Sqrt[(d_.) + (e_.)*(x_)])/Sqrt[(f_.) + (g_.
)*(x_)]))^(n_.)/((A_.) + (B_.)*(x_) + (C_.)*(x_)^2), x_Symbol] :> Dist[(2*e
```

```
*g)/(C*(e*f - d*g)), Subst[Int[(a + b*F^(c*x))^n/x, x], x, Sqrt[d + e*x]/Sq
rt[f + g*x]], x] /; FreeQ[{a, b, c, d, e, f, g, A, B, C, F}, x] && EqQ[C*d*
f - A*e*g, 0] && EqQ[B*e*g - C*(e*f + d*g), 0] && IGtQ[n, 0]
```

Rubi steps

$$\begin{aligned}\int \frac{a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}}{df+(ef+dg)x+egx^2}\,dx &= \frac{2\,\text{Subst}\left(\int \frac{a+bF^{cx}}{x}\,dx, x, \frac{\sqrt{d+ex}}{\sqrt{f+gx}}\right)}{ef-dg}\\ &= \frac{2\,\text{Subst}\left(\int \left(\frac{a}{x}+\frac{bF^{cx}}{x}\right)dx, x, \frac{\sqrt{d+ex}}{\sqrt{f+gx}}\right)}{ef-dg}\\ &= \frac{2a\log\left(\frac{\sqrt{d+ex}}{\sqrt{f+gx}}\right)}{ef-dg}+\frac{(2b)\,\text{Subst}\left(\int \frac{F^{cx}}{x}\,dx, x, \frac{\sqrt{d+ex}}{\sqrt{f+gx}}\right)}{ef-dg}\\ &= \frac{2b\text{Ei}\left(\frac{c\sqrt{d+ex}\log(F)}{\sqrt{f+gx}}\right)}{ef-dg}+\frac{2a\log\left(\frac{\sqrt{d+ex}}{\sqrt{f+gx}}\right)}{ef-dg}\end{aligned}$$

Mathematica [F] time = 0.52, size = 0, normalized size = 0.00

$$\int \frac{a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}}{df+(ef+dg)x+egx^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a + b*F^((c*Sqrt[d + e*x])/Sqrt[f + g*x]))/(d*f + (e*f + d*g)*x
+ e*g*x^2),x]
```

```
[Out] Integrate[(a + b*F^((c*Sqrt[d + e*x])/Sqrt[f + g*x]))/(d*f + (e*f + d*g)*x
+ e*g*x^2), x]
```

fricas [F] time = 58.68, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{F^{\frac{\sqrt{ex+d}\,c}{\sqrt{gx+f}}}b+a}{egx^2+df+\left(ef+dg\right)x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))/(d*f+(d*g+e*f)*x+e*g*x^2)
,x, algorithm="fricas")
```

```
[Out] integral((F^(sqrt(e*x + d)*c/sqrt(g*x + f))*b + a)/(e*g*x^2 + d*f + (e*f +
d*g)*x), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{\frac{\sqrt{ex+d}\,c}{\sqrt{gx+f}}}b + a}{egx^2 + df + \left(ef + dg\right)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))/(d*f+(d*g+e*f)*x+e*g*x^2)
,x, algorithm="giac")
```

```
[Out] integrate((F^(sqrt(e*x + d)*c/sqrt(g*x + f))*b + a)/(e*g*x^2 + d*f + (e*f +
 d*g)*x), x)
```

maple [F] time = 0.16, size = 0, normalized size = 0.00

$$\int \frac{b\,F^{\frac{\sqrt{ex+d}\;c}{\sqrt{gx+f}}} + a}{eg\,x^2 + df + \left(dg + ef\right)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*F^((e*x+d)^(1/2)/(g*x+f)^(1/2)*c)+a)/(e*g*x^2+d*f+(d*g+e*f)*x),x)
```

```
[Out] int((b*F^((e*x+d)^(1/2)/(g*x+f)^(1/2)*c)+a)/(e*g*x^2+d*f+(d*g+e*f)*x),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$a\left(\frac{\log\left(ex+d\right)}{ef-dg} - \frac{\log\left(gx+f\right)}{ef-dg}\right) + b\int \frac{F^{\frac{\sqrt{ex+d}\,c}{\sqrt{gx+f}}}}{egx^2 + df + \left(ef + dg\right)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))/(d*f+(d*g+e*f)*x+e*g*x^2)
,x, algorithm="maxima")
```

```
[Out] a*(log(e*x + d)/(e*f - d*g) - log(g*x + f)/(e*f - d*g)) + b*integrate(F^(sq
rt(e*x + d)*c/sqrt(g*x + f))/(e*g*x^2 + d*f + (e*f + d*g)*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+F^{\frac{c\,\sqrt{d+e\,x}}{\sqrt{f+g\,x}}}\,b}{e\,g\,x^2+\left(d\,g+e\,f\right)\,x+d\,f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + F^((c*(d + e*x)^(1/2))/(f + g*x)^(1/2))*b)/(d*f + x*(d*g + e*f) +
e*g*x^2),x)
```

```
[Out] int((a + F^((c*(d + e*x)^(1/2))/(f + g*x)^(1/2))*b)/(d*f + x*(d*g + e*f) +
e*g*x^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}b+a}{(d+ex)\left(f+gx\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F**(c*(e*x+d)**(1/2)/(g*x+f)**(1/2)))/(d*f+(d*g+e*f)*x+e*g*x
**2),x)
```

```
[Out] Integral((F**(c*sqrt(d + e*x)/sqrt(f + g*x))*b + a)/((d + e*x)*(f + g*x)),
x)
```

3.547 $\int \frac{1}{df+(ef+dg)x+egx^2}\,dx$

Optimal. Leaf size=36

$$\frac{\log(d+ex)}{ef-dg}-\frac{\log(f+gx)}{ef-dg}$$

```
[Out] ln(e*x+d)/(-d*g+e*f)-ln(g*x+f)/(-d*g+e*f)
```

Rubi [A] time = 0.01, antiderivative size = 36, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {616, 31}

$$\frac{\log(d+ex)}{ef-dg}-\frac{\log(f+gx)}{ef-dg}$$

Antiderivative was successfully verified.

```
[In] Int[(d*f + (e*f + d*g)*x + e*g*x^2)^(-1),x]
```

```
[Out] Log[d + e*x]/(e*f - d*g) - Log[f + g*x]/(e*f - d*g)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x, x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 616

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dist[c/q, Int[1/Simp[b/2 - q/2 + c*x, x], x], x] - Dist[c/q, Int[1/Simp[b/2 + q/2 + c*x, x], x], x]] /; FreeQ[{a, b, c}, x] && NeQ[b^2 - 4*a*c, 0] && PosQ[b^2 - 4*a*c] && PerfectSquareQ[b^2 - 4*a*c]
```

Rubi steps

$$\begin{aligned}\int \frac{1}{df+(ef+dg)x+egx^2}\,dx &= -\frac{(eg)\int \frac{1}{ef+egx}\,dx}{ef-dg}+\frac{(eg)\int \frac{1}{dg+egx}\,dx}{ef-dg}\\ &= \frac{\log(d+ex)}{ef-dg}-\frac{\log(f+gx)}{ef-dg}\end{aligned}$$

Mathematica [A] time = 0.01, size = 26, normalized size = 0.72

$$\frac{\log(d+ex)-\log(f+gx)}{ef-dg}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d*f + (e*f + d*g)*x + e*g*x^2)^(-1),x]
[Out] (Log[d + e*x] - Log[f + g*x])/(e*f - d*g)
```

fricas [A] time = 0.43, size = 26, normalized size = 0.72

$$\frac{\log\left(ex+d\right)-\log\left(gx+f\right)}{ef-dg}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*f+(d*g+e*f)*x+e*g*x^2),x, algorithm="fricas")
[Out] (log(e*x + d) - log(g*x + f))/(e*f - d*g)
```

giac [A] time = 0.29, size = 49, normalized size = 1.36

$$\frac{g\log\left(\left|gx+f\right|\right)}{dg^2-fge}-\frac{e\log\left(\left|xe+d\right|\right)}{dge-fe^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*f+(d*g+e*f)*x+e*g*x^2),x, algorithm="giac")
[Out] g*log(abs(g*x + f))/(d*g^2 - f*g*e) - e*log(abs(x*e + d))/(d*g*e - f*e^2)
```

maple [A] time = 0.01, size = 37, normalized size = 1.03

$$-\frac{\ln\left(ex+d\right)}{dg-ef}+\frac{\ln\left(gx+f\right)}{dg-ef}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*g*x^2+d*f+(d*g+e*f)*x),x)
[Out] 1/(d*g-e*f)*ln(g*x+f)-1/(d*g-e*f)*ln(e*x+d)
```

maxima [A] time = 1.10, size = 36, normalized size = 1.00

$$\frac{\log\left(ex+d\right)}{ef-dg}-\frac{\log\left(gx+f\right)}{ef-dg}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*f+(d*g+e*f)*x+e*g*x^2),x, algorithm="maxima")
```

```
[Out] log(e*x + d)/(e*f - d*g) - log(g*x + f)/(e*f - d*g)
```

mupad [B] time = 0.10, size = 40, normalized size = 1.11

$$\frac{\operatorname{atan}\left(\frac{e\,f\,2\mathrm{i}+e\,g\,x\,2\mathrm{i}}{d\,g-e\,f}+1\mathrm{i}\right)\,2\mathrm{i}}{d\,g-e\,f}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(d*f + x*(d*g + e*f) + e*g*x^2),x)
```

```
[Out] (atan((e*f*2i + e*g*x*2i)/(d*g - e*f) + 1i)*2i)/(d*g - e*f)
```

sympy [B] time = 0.31, size = 128, normalized size = 3.56

$$\frac{\log\left(x+\frac{-\frac{d^2g^2}{dg-ef}+\frac{2defg}{dg-ef}+dg-\frac{e^2f^2}{dg-ef}+ef}{2eg}\right)}{dg-ef}-\frac{\log\left(x+\frac{\frac{d^2g^2}{dg-ef}-\frac{2defg}{dg-ef}+dg+\frac{e^2f^2}{dg-ef}+ef}{2eg}\right)}{dg-ef}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*f+(d*g+e*f)*x+e*g*x**2),x)
```

```
[Out] log(x + (-d**2*g**2/(d*g - e*f) + 2*d*e*f*g/(d*g - e*f) + d*g - e**2*f**2/(
d*g - e*f) + e*f)/(2*e*g))/(d*g - e*f) - log(x + (d**2*g**2/(d*g - e*f) - 2
*d*e*f*g/(d*g - e*f) + d*g + e**2*f**2/(d*g - e*f) + e*f)/(2*e*g))/(d*g - e
*f)
```

3.548 $\int \frac{1}{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\right)(df+(ef+dg)x+egx^2)}\,dx$

Optimal. Leaf size=53

$$\text{Int}\left(\frac{1}{\left(x(dg+ef)+df+egx^2\right)\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\right)},x\right)$$

```
[Out] Unintegrable(1/(a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))/(d*f+(d*g+e*f)*x+e*g
*x^2),x)
```

Rubi [A] time = 0.15, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\right)\left(df+(ef+dg)x+egx^2\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a + b*F^((c*Sqrt[d + e*x])/Sqrt[f + g*x]))*(d*f + (e*f + d*g)*x + e
*g*x^2)),x]
```

```
[Out] Defer[Int][1/((a + b*F^((c*Sqrt[d + e*x])/Sqrt[f + g*x]))*(d*f + (e*f + d*g
)*x + e*g*x^2)), x]
```

Rubi steps

$$\int \frac{1}{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\right)\left(df+(ef+dg)x+egx^2\right)}\,dx=\int \frac{1}{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\right)\left(df+(ef+dg)x+egx^2\right)}\,dx$$

Mathematica [A] time = 0.39, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\right)\left(df+(ef+dg)x+egx^2\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((a + b*F^((c*Sqrt[d + e*x])/Sqrt[f + g*x]))*(d*f + (e*f + d*g)
*x + e*g*x^2)),x]
```

```
[Out] Integrate[1/((a + b*F^((c*Sqrt[d + e*x])/Sqrt[f + g*x]))*(d*f + (e*f + d*g)
*x + e*g*x^2)), x]
```

fricas [A] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{aegx^2+adf+\left(begx^2+bdf+\left(bef+bdg\right)x\right)F^{\frac{\sqrt{ex+d}\,c}{\sqrt{gx+f}}}+\left(aef+adg\right)x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))/(d*f+(d*g+e*f)*x+e*g*x^
2),x, algorithm="fricas")
```

```
[Out] integral(1/(a*e*g*x^2 + a*d*f + (b*e*g*x^2 + b*d*f + (b*e*f + b*d*g)*x)*F^(
sqrt(e*x + d)*c/sqrt(g*x + f)) + (a*e*f + a*d*g)*x), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(egx^2+df+\left(ef+dg\right)x\right)\left(F^{\frac{\sqrt{ex+d}\,c}{\sqrt{gx+f}}}b+a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))/(d*f+(d*g+e*f)*x+e*g*x^
2),x, algorithm="giac")
```

```
[Out] integrate(1/((e*g*x^2 + d*f + (e*f + d*g)*x)*(F^(sqrt(e*x + d)*c/sqrt(g*x +
 f))*b + a)), x)
```

maple [A] time = 0.16, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bF^{\frac{\sqrt{ex+d}\,c}{\sqrt{gx+f}}}+a\right)\left(eg\,x^2+df+\left(dg+ef\right)x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*F^((e*x+d)^(1/2)/(g*x+f)^(1/2)*c)+a)/(e*g*x^2+d*f+(d*g+e*f)*x),x)
```

```
[Out] int(1/(b*F^((e*x+d)^(1/2)/(g*x+f)^(1/2)*c)+a)/(e*g*x^2+d*f+(d*g+e*f)*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(egx^2 + df + \left(ef + dg\right)x\right)\left(F^{\frac{\sqrt{ex+d}\,c}{\sqrt{gx+f}}}b + a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))/(d*f+(d*g+e*f)*x+e*g*x^
2),x, algorithm="maxima")
```

```
[Out] integrate(1/((e*g*x^2 + d*f + (e*f + d*g)*x)*(F^(sqrt(e*x + d)*c/sqrt(g*x +
 f))*b + a)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{1}{\left(a + F^{\frac{c\,\sqrt{d+e\,x}}{\sqrt{f+g\,x}}}\,b\right)\,\left(e\,g\,x^2 + \left(d\,g + e\,f\right)\,x + d\,f\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a + F^((c*(d + e*x)^(1/2))/(f + g*x)^(1/2))*b)*(d*f + x*(d*g + e*f)
 + e*g*x^2)),x)
```

```
[Out] int(1/((a + F^((c*(d + e*x)^(1/2))/(f + g*x)^(1/2))*b)*(d*f + x*(d*g + e*f)
 + e*g*x^2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(d + ex)\left(f + gx\right)\left(F^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}b + a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*F**(c*(e*x+d)**(1/2)/(g*x+f)**(1/2)))/(d*f+(d*g+e*f)*x+e*g
*x**2),x)
```

```
[Out] Integral(1/((d + e*x)*(f + g*x)*(F**(c*sqrt(d + e*x)/sqrt(f + g*x))*b + a))
, x)
```

3.549 $\int \frac{1}{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\right)^2 (df+(ef+dg)x+egx^2)}\,dx$

Optimal. Leaf size=53

$$\text{Int}\left(\frac{1}{\left(x(dg+ef)+df+egx^2\right)\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\right)^2},x\right)$$

```
[Out] Unintegrable(1/(a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))^2/(d*f+(d*g+e*f)*x+e
*g*x^2),x)
```

Rubi [A] time = 0.15, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\right)^2 \left(df+(ef+dg)x+egx^2\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a + b*F^((c*Sqrt[d + e*x])/Sqrt[f + g*x]))^2*(d*f + (e*f + d*g)*x +
 e*g*x^2)),x]
```

```
[Out] Defer[Int][1/((a + b*F^((c*Sqrt[d + e*x])/Sqrt[f + g*x]))^2*(d*f + (e*f + d
*g)*x + e*g*x^2)), x]
```

Rubi steps

$$\int \frac{1}{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\right)^2 \left(df+(ef+dg)x+egx^2\right)}\,dx = \int \frac{1}{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\right)^2 \left(df+(ef+dg)x+egx^2\right)}\,dx$$

Mathematica [A] time = 1.27, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a + bF^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}\right)^2 \left(df + (ef + dg)x + egx^2\right)} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((a + b*F^((c*Sqrt[d + e*x])/Sqrt[f + g*x]))^2*(d*f + (e*f + d*
g)*x + e*g*x^2)),x]
```

```
[Out] Integrate[1/((a + b*F^((c*Sqrt[d + e*x])/Sqrt[f + g*x]))^2*(d*f + (e*f + d*
g)*x + e*g*x^2)), x]
```

fricas [A] time = 13.17, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{a^2egx^2 + a^2df + \left(b^2egx^2 + b^2df + \left(b^2ef + b^2dg\right)x\right)F^{\frac{2\sqrt{ex+d}\,c}{\sqrt{gx+f}}} + 2\left(abegx^2 + abdf + \left(abef + abdg\right)x\right)F^{\frac{\sqrt{e}}{\sqrt{g}}}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))^2/(d*f+(d*g+e*f)*x+e*g*
x^2),x, algorithm="fricas")
```

```
[Out] integral(1/(a^2*e*g*x^2 + a^2*d*f + (b^2*e*g*x^2 + b^2*d*f + (b^2*e*f + b^2
*d*g)*x)*F^(2*sqrt(e*x + d)*c/sqrt(g*x + f)) + 2*(a*b*e*g*x^2 + a*b*d*f + (
a*b*e*f + a*b*d*g)*x)*F^(sqrt(e*x + d)*c/sqrt(g*x + f)) + (a^2*e*f + a^2*d*
g)*x), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(egx^2 + df + \left(ef + dg\right)x\right)\left(F^{\frac{\sqrt{ex+d}\,c}{\sqrt{gx+f}}}b + a\right)^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))^2/(d*f+(d*g+e*f)*x+e*g*
x^2),x, algorithm="giac")
```

```
[Out] integrate(1/((e*g*x^2 + d*f + (e*f + d*g)*x)*(F^(sqrt(e*x + d)*c/sqrt(g*x +
 f))*b + a)^2), x)
```

maple [A] time = 0.15, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(b\,F^{\frac{\sqrt{ex+d}\,c}{\sqrt{gx+f}}}+a\right)^{2}\left(eg\,x^{2}+df+\left(dg+ef\right)x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*F^((e*x+d)^(1/2)/(g*x+f)^(1/2)*c)+a)^2/(e*g*x^2+d*f+(d*g+e*f)*x),x
)
```

```
[Out] int(1/(b*F^((e*x+d)^(1/2)/(g*x+f)^(1/2)*c)+a)^2/(e*g*x^2+d*f+(d*g+e*f)*x),x
)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{2\sqrt{gx+f}}{\left(ef-dg\right)\sqrt{ex+d}\,F^{\frac{\sqrt{ex+d}\,c}{\sqrt{gx+f}}}\,abc\log(F)+\left(ef-dg\right)\sqrt{ex+d}\,a^{2}c\log(F)}+\int\frac{}{\left(abcegx^{2}\log(F)+abcdf\log(F)+\left(ef+\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*F^(c*(e*x+d)^(1/2)/(g*x+f)^(1/2)))^2/(d*f+(d*g+e*f)*x+e*g*
x^2),x, algorithm="maxima")
```

```
[Out] 2*sqrt(g*x + f)/((e*f - d*g)*sqrt(e*x + d)*F^(sqrt(e*x + d)*c/sqrt(g*x + f)
)*a*b*c*log(F) + (e*f - d*g)*sqrt(e*x + d)*a^2*c*log(F)) + integrate((sqrt(
e*x + d)*c*log(F) + sqrt(g*x + f))/((a*b*c*e*g*x^2*log(F) + a*b*c*d*f*log(F
) + (e*f + d*g)*a*b*c*x*log(F))*sqrt(e*x + d)*F^(sqrt(e*x + d)*c/sqrt(g*x +
 f)) + (a^2*c*e*g*x^2*log(F) + a^2*c*d*f*log(F) + (e*f + d*g)*a^2*c*x*log(F
))*sqrt(e*x + d)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{1}{\left(a+F^{\frac{c\,\sqrt{d+e\,x}}{\sqrt{f+g\,x}}}\,b\right)^{2}\left(e\,g\,x^{2}+\left(d\,g+e\,f\right)\,x+d\,f\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a + F^((c*(d + e*x)^(1/2))/(f + g*x)^(1/2))*b)^2*(d*f + x*(d*g + e*
f) + e*g*x^2)),x)
```

```
[Out] int(1/((a + F^((c*(d + e*x)^(1/2))/(f + g*x)^(1/2))*b)^2*(d*f + x*(d*g + e*
f) + e*g*x^2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(d+ex)\left(f+gx\right)\left(F^{\frac{c\sqrt{d+ex}}{\sqrt{f+gx}}}b+a\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*F**(c*(e*x+d)**(1/2)/(g*x+f)**(1/2)))**2/(d*f+(d*g+e*f)*x+
e*g*x**2),x)
```

```
[Out] Integral(1/((d + e*x)*(f + g*x)*(F**(c*sqrt(d + e*x)/sqrt(f + g*x))*b + a)*
*2), x)
```

3.550 $\int \frac{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}\right)^n}{d^2-e^2x^2}\,dx$

Optimal. Leaf size=50

$$\text{Int}\left(\frac{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}\right)^n}{d^2-e^2x^2},x\right)$$

```
[Out] Unintegrable((a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))^n/(-e^2*x^2+d^2),
x)
```

Rubi [A] time = 0.23, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}\right)^n}{d^2-e^2x^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a + b*F^((c*Sqrt[d + e*x])/Sqrt[d*f - e*f*x]))^n/(d^2 - e^2*x^2),x]
```

```
[Out] Defer[Int][(a + b*F^((c*Sqrt[d + e*x])/Sqrt[d*f - e*f*x]))^n/(d^2 - e^2*x^2
), x]
```

Rubi steps

$$\int \frac{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}\right)^n}{d^2-e^2x^2}\,dx=\int \frac{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}\right)^n}{d^2-e^2x^2}\,dx$$

Mathematica [A] time = 0.73, size = 0, normalized size = 0.00

$$\int \frac{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}\right)^n}{d^2-e^2x^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a + b*F^((c*Sqrt[d + e*x])/Sqrt[d*f - e*f*x]))^n/(d^2 - e^2*x^2)
,x]
```

```
[Out] Integrate[(a + b*F^((c*Sqrt[d + e*x])/Sqrt[d*f - e*f*x]))^n/(d^2 - e^2*x^2)
, x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))^n/(-e^2*x^2+d^2),x,
algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   alglo
gextint: unimplemented
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int -\frac{\left(F^{\frac{\sqrt{ex+d}\,c}{\sqrt{-efx+df}}} b + a\right)^{n}}{e^{2}x^{2} - d^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))^n/(-e^2*x^2+d^2),x,
algorithm="giac")
```

```
[Out] integrate(-(F^(sqrt(e*x + d)*c/sqrt(-e*f*x + d*f))*b + a)^n/(e^2*x^2 - d^2)
, x)
```

maple [A] time = 0.11, size = 0, normalized size = 0.00

$$\int \frac{\left(b\,F^{\frac{\sqrt{ex+d}\;c}{\sqrt{-efx+df}}} + a\right)^{n}}{-e^{2}x^{2} + d^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))^n/(-e^2*x^2+d^2),x)
```

```
[Out] int((a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))^n/(-e^2*x^2+d^2),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\int \frac{\left(F^{\frac{\sqrt{ex+d}c}{\sqrt{-efx+df}}}b+a\right)^{n}}{e^{2}x^{2}-d^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))^n/(-e^2*x^2+d^2),x, algorithm="maxima")
```

```
[Out] -integrate((F^(sqrt(e*x + d)*c/sqrt(-e*f*x + d*f))*b + a)^n/(e^2*x^2 - d^2), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{\left(a+b\,\mathrm{e}^{\frac{c\,\ln(F)\,\sqrt{d+e\,x}}{\sqrt{d\,f-e\,f\,x}}}\right)^{n}}{d^{2}-e^{2}\,x^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + F^((c*(d + e*x)^(1/2))/(d*f - e*f*x)^(1/2))*b)^n/(d^2 - e^2*x^2),x)
```

```
[Out] int((a + b*exp((c*log(F)*(d + e*x)^(1/2))/(d*f - e*f*x)^(1/2)))^n/(d^2 - e^2*x^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$-\int \frac{\left(F^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}b+a\right)^{n}}{-d^{2}+e^{2}x^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F**(c*(e*x+d)**(1/2)/(-e*f*x+d*f)**(1/2)))**n/(-e**2*x**2+d**2),x)
```

```
[Out] -Integral((F**(c*sqrt(d + e*x)/sqrt(d*f - e*f*x))*b + a)**n/(-d**2 + e**2*x**2), x)
```

3.551 $\int \frac{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}\right)^3}{d^2-e^2x^2}\,dx$

Optimal. Leaf size=152

$$\frac{a^3\log\left(\frac{\sqrt{d+ex}}{\sqrt{df-efx}}\right)}{de}+\frac{3a^2b\text{Ei}\left(\frac{c\sqrt{d+ex}\log(F)}{\sqrt{df-efx}}\right)}{de}+\frac{3ab^2\text{Ei}\left(\frac{2c\sqrt{d+ex}\log(F)}{\sqrt{df-efx}}\right)}{de}+\frac{b^3\text{Ei}\left(\frac{3c\sqrt{d+ex}\log(F)}{\sqrt{df-efx}}\right)}{de}$$

```
[Out] 3*a^2*b*Ei(c*ln(F)*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2))/d/e+3*a*b^2*Ei(2*c*ln(
F)*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2))/d/e+b^3*Ei(3*c*ln(F)*(e*x+d)^(1/2)/(-e
*f*x+d*f)^(1/2))/d/e+a^3*ln((e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2))/d/e
```

Rubi [A] time = 0.33, antiderivative size = 152, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 3, integrand size = 47, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.064, Rules used = {2291, 2183, 2178}

$$\frac{3a^2b\text{Ei}\left(\frac{c\sqrt{d+ex}\log(F)}{\sqrt{df-efx}}\right)}{de}+\frac{a^3\log\left(\frac{\sqrt{d+ex}}{\sqrt{df-efx}}\right)}{de}+\frac{3ab^2\text{Ei}\left(\frac{2c\sqrt{d+ex}\log(F)}{\sqrt{df-efx}}\right)}{de}+\frac{b^3\text{Ei}\left(\frac{3c\sqrt{d+ex}\log(F)}{\sqrt{df-efx}}\right)}{de}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*F^((c*Sqrt[d + e*x])/Sqrt[d*f - e*f*x]))^3/(d^2 - e^2*x^2),x]
```

```
[Out] (3*a^2*b*ExpIntegralEi[(c*Sqrt[d + e*x]*Log[F])/Sqrt[d*f - e*f*x]])/(d*e) +
 (3*a*b^2*ExpIntegralEi[(2*c*Sqrt[d + e*x]*Log[F])/Sqrt[d*f - e*f*x]])/(d*e
) + (b^3*ExpIntegralEi[(3*c*Sqrt[d + e*x]*Log[F])/Sqrt[d*f - e*f*x]])/(d*e)
 + (a^3*Log[Sqrt[d + e*x]/Sqrt[d*f - e*f*x]])/(d*e)
```

Rule 2178

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - (c*f)/d))*ExpIntegralEi[(f*g*(c + d*x)*Log[F])/d])/d, x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2183

```
Int[((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.))^(p_.)*((c_.) +
 (d_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c + d*x)^m, (a + b*(F
^(g*(e + f*x)))^n)^p, x], x] /; FreeQ[{F, a, b, c, d, e, f, g, m, n}, x] &&
 IGtQ[p, 0]
```

Rule 2291

```
Int[((a_.) + (b_.)*(F_)^(((c_.)*Sqrt[(d_.) + (e_.)*(x_)])/Sqrt[(f_.) + (g_.
)*(x_)]))^(n_.)/((A_) + (C_.)*(x_)^2), x_Symbol] :> Dist[(2*e*g)/(C*(e*f -
d*g)), Subst[Int[(a + b*F^(c*x))^n/x, x], x, Sqrt[d + e*x]/Sqrt[f + g*x]],
x] /; FreeQ[{a, b, c, d, e, f, g, A, C, F}, x] && EqQ[C*d*f - A*e*g, 0] &&
EqQ[e*f + d*g, 0] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}\right)^3}{d^2-e^2x^2}\,dx = \frac{\text{Subst}\left(\int \frac{(a+bF^{cx})^3}{x}\,dx, x, \frac{\sqrt{d+ex}}{\sqrt{df-efx}}\right)}{de}$$

$$= \frac{\text{Subst}\left(\int \left(\frac{a^3}{x}+\frac{3a^2bF^{cx}}{x}+\frac{3ab^2F^{2cx}}{x}+\frac{b^3F^{3cx}}{x}\right)dx, x, \frac{\sqrt{d+ex}}{\sqrt{df-efx}}\right)}{de}$$

$$= \frac{a^3\log\left(\frac{\sqrt{d+ex}}{\sqrt{df-efx}}\right)}{de} + \frac{\left(3a^2b\right)\text{Subst}\left(\int \frac{F^{cx}}{x}\,dx, x, \frac{\sqrt{d+ex}}{\sqrt{df-efx}}\right)}{de} + \frac{\left(3ab^2\right)\text{Subst}\left(\int \frac{F^{2cx}}{x}\,dx, x, \right.}{de}$$

$$= \frac{3a^2b\text{Ei}\left(\frac{c\sqrt{d+ex}\log(F)}{\sqrt{df-efx}}\right)}{de} + \frac{3ab^2\text{Ei}\left(\frac{2c\sqrt{d+ex}\log(F)}{\sqrt{df-efx}}\right)}{de} + \frac{b^3\text{Ei}\left(\frac{3c\sqrt{d+ex}\log(F)}{\sqrt{df-efx}}\right)}{de} + \frac{a^3\log\left(\frac{\sqrt{d+}}{\sqrt{df-}}\right.}{de}$$

Mathematica [F] time = 1.34, size = 0, normalized size = 0.00

$$\int \frac{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}\right)^3}{d^2-e^2x^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a + b*F^((c*Sqrt[d + e*x])/Sqrt[d*f - e*f*x]))^3/(d^2 - e^2*x^2)
,x]
```

```
[Out] Integrate[(a + b*F^((c*Sqrt[d + e*x])/Sqrt[d*f - e*f*x]))^3/(d^2 - e^2*x^2)
, x]
```

fricas [F] time = 5.28, size = 0, normalized size = 0.00

$$\text{integral}\left(-\frac{a^3+\frac{3\,a^2b}{F^{\frac{\sqrt{-efx+df}\,\sqrt{ex+d}\,c}{efx-df}}}+\frac{3\,ab^2}{F^{\frac{2\,\sqrt{-efx+df}\,\sqrt{ex+d}\,c}{efx-df}}}+\frac{b^3}{F^{\frac{3\,\sqrt{-efx+df}\,\sqrt{ex+d}\,c}{efx-df}}}}{e^2x^2-d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))^3/(-e^2*x^2+d^2),x,
algorithm="fricas")
```

```
[Out] integral(-(a^3 + 3*a^2*b/F^(sqrt(-e*f*x + d*f)*sqrt(e*x + d)*c/(e*f*x - d*f
)) + 3*a*b^2/F^(2*sqrt(-e*f*x + d*f)*sqrt(e*x + d)*c/(e*f*x - d*f)) + b^3/F
^(3*sqrt(-e*f*x + d*f)*sqrt(e*x + d)*c/(e*f*x - d*f)))/(e^2*x^2 - d^2), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))^3/(-e^2*x^2+d^2),x,
algorithm="giac")
```

```
[Out] Timed out
```

maple [F] time = 0.10, size = 0, normalized size = 0.00

$$\int \frac{\left(b\,F^{\frac{\sqrt{ex+d}\,c}{\sqrt{-efx+df}}}+a\right)^3}{-e^2x^2+d^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*F^((e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)*c)+a)^3/(-e^2*x^2+d^2),x)
```

```
[Out] int((b*F^((e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)*c)+a)^3/(-e^2*x^2+d^2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2}\,a^3\left(\frac{\log\left(ex+d\right)}{de}-\frac{\log\left(ex-d\right)}{de}\right)-b^3\int\frac{F^{\frac{3\,\sqrt{ex+d}\,c}{\sqrt{-ex+d}\,\sqrt{f}}}}{e^2x^2-d^2}\,dx-3\,ab^2\int\frac{F^{\frac{2\,\sqrt{ex+d}\,c}{\sqrt{-ex+d}\,\sqrt{f}}}}{e^2x^2-d^2}\,dx-3\,a^2b\int\frac{F^{\frac{\sqrt{ex+d}\,c}{\sqrt{-ex+d}\,\sqrt{f}}}}{e^2x^2-d^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))^3/(-e^2*x^2+d^2),x,
algorithm="maxima")
```

```
[Out] 1/2*a^3*(log(e*x + d)/(d*e) - log(e*x - d)/(d*e)) - b^3*integrate(F^(3*sqrt
(e*x + d)*c/(sqrt(-e*x + d)*sqrt(f)))/(e^2*x^2 - d^2), x) - 3*a*b^2*integra
te(F^(2*sqrt(e*x + d)*c/(sqrt(-e*x + d)*sqrt(f)))/(e^2*x^2 - d^2), x) - 3*a
^2*b*integrate(F^(sqrt(e*x + d)*c/(sqrt(-e*x + d)*sqrt(f)))/(e^2*x^2 - d^2)
, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(a+b\,\mathrm{e}^{\frac{c\,\ln(F)\,\sqrt{d+e\,x}}{\sqrt{d\,f-e\,f\,x}}}\right)^3}{d^2-e^2\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + F^((c*(d + e*x)^(1/2))/(d*f - e*f*x)^(1/2))*b)^3/(d^2 - e^2*x^2),x
)
```

```
[Out] int((a + b*exp((c*log(F)*(d + e*x)^(1/2))/(d*f - e*f*x)^(1/2)))^3/(d^2 - e^
2*x^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\int \frac{a^3}{-d^2+e^2x^2}\,dx-\int \frac{F^{\frac{3c\sqrt{d+ex}}{\sqrt{df-efx}}}b^3}{-d^2+e^2x^2}\,dx-\int \frac{3F^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}a^2b}{-d^2+e^2x^2}\,dx-\int \frac{3F^{\frac{2c\sqrt{d+ex}}{\sqrt{df-efx}}}ab^2}{-d^2+e^2x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F**(c*(e*x+d)**(1/2)/(-e*f*x+d*f)**(1/2)))**3/(-e**2*x**2+d*
*2),x)
```

```
[Out] -Integral(a**3/(-d**2 + e**2*x**2), x) - Integral(F**(3*c*sqrt(d + e*x)/sqr
t(d*f - e*f*x))*b**3/(-d**2 + e**2*x**2), x) - Integral(3*F**(c*sqrt(d + e*
x)/sqrt(d*f - e*f*x))*a**2*b/(-d**2 + e**2*x**2), x) - Integral(3*F**(2*c*s
qrt(d + e*x)/sqrt(d*f - e*f*x))*a*b**2/(-d**2 + e**2*x**2), x)
```

3.552 $\int \frac{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}\right)^2}{d^2-e^2x^2}\,dx$

Optimal. Leaf size=110

$$\frac{a^2\log\left(\frac{\sqrt{d+ex}}{\sqrt{df-efx}}\right)}{de}+\frac{2ab\text{Ei}\left(\frac{c\sqrt{d+ex}\log(F)}{\sqrt{df-efx}}\right)}{de}+\frac{b^2\text{Ei}\left(\frac{2c\sqrt{d+ex}\log(F)}{\sqrt{df-efx}}\right)}{de}$$

```
[Out] 2*a*b*Ei(c*ln(F)*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2))/d/e+b^2*Ei(2*c*ln(F)*(e*
x+d)^(1/2)/(-e*f*x+d*f)^(1/2))/d/e+a^2*ln((e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2))
/d/e
```

Rubi [A] time = 0.30, antiderivative size = 110, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, integrand size = 47, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.064, Rules used = {2291, 2183, 2178}

$$\frac{a^2\log\left(\frac{\sqrt{d+ex}}{\sqrt{df-efx}}\right)}{de}+\frac{2ab\text{Ei}\left(\frac{c\sqrt{d+ex}\log(F)}{\sqrt{df-efx}}\right)}{de}+\frac{b^2\text{Ei}\left(\frac{2c\sqrt{d+ex}\log(F)}{\sqrt{df-efx}}\right)}{de}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*F^((c*Sqrt[d + e*x])/Sqrt[d*f - e*f*x]))^2/(d^2 - e^2*x^2),x]
```

```
[Out] (2*a*b*ExpIntegralEi[(c*Sqrt[d + e*x]*Log[F])/Sqrt[d*f - e*f*x]])/(d*e) + (
b^2*ExpIntegralEi[(2*c*Sqrt[d + e*x]*Log[F])/Sqrt[d*f - e*f*x]])/(d*e) + (a
^2*Log[Sqrt[d + e*x]/Sqrt[d*f - e*f*x]])/(d*e)
```

Rule 2178

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - (c*f)/d))*ExpIntegralEi[(f*g*(c + d*x)*Log[F])/d])/d, x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2183

```
Int[((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.))^(p_.)*((c_.) +
 (d_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c + d*x)^m, (a + b*(F
^(g*(e + f*x)))^n)^p, x], x] /; FreeQ[{F, a, b, c, d, e, f, g, m, n}, x] &&
 IGtQ[p, 0]
```

Rule 2291

```
Int[((a_.) + (b_.)*(F_)^(((c_.)*Sqrt[(d_.) + (e_.)*(x_)])/Sqrt[(f_.) + (g_.
)*(x_)]))^(n_.)/((A_) + (C_.)*(x_)^2), x_Symbol] :> Dist[(2*e*g)/(C*(e*f -
d*g)), Subst[Int[(a + b*F^(c*x))^n/x, x], x, Sqrt[d + e*x]/Sqrt[f + g*x]],
x] /; FreeQ[{a, b, c, d, e, f, g, A, C, F}, x] && EqQ[C*d*f - A*e*g, 0] &&
EqQ[e*f + d*g, 0] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}\right)^2}{d^2-e^2x^2}\,dx = \frac{\text{Subst}\left(\int \frac{(a+bF^{cx})^2}{x}\,dx, x, \frac{\sqrt{d+ex}}{\sqrt{df-efx}}\right)}{de}$$
$$= \frac{\text{Subst}\left(\int \left(\frac{a^2}{x}+\frac{2abF^{cx}}{x}+\frac{b^2F^{2cx}}{x}\right)dx, x, \frac{\sqrt{d+ex}}{\sqrt{df-efx}}\right)}{de}$$
$$= \frac{a^2\log\left(\frac{\sqrt{d+ex}}{\sqrt{df-efx}}\right)}{de}+\frac{(2ab)\,\text{Subst}\left(\int \frac{F^{cx}}{x}\,dx, x, \frac{\sqrt{d+ex}}{\sqrt{df-efx}}\right)}{de}+\frac{b^2\,\text{Subst}\left(\int \frac{F^{2cx}}{x}\,dx, x, \frac{\sqrt{d+ex}}{\sqrt{df-efx}}\right)}{de}$$
$$= \frac{2ab\text{Ei}\left(\frac{c\sqrt{d+ex}\,\log(F)}{\sqrt{df-efx}}\right)}{de}+\frac{b^2\text{Ei}\left(\frac{2c\sqrt{d+ex}\,\log(F)}{\sqrt{df-efx}}\right)}{de}+\frac{a^2\log\left(\frac{\sqrt{d+ex}}{\sqrt{df-efx}}\right)}{de}$$

Mathematica [F] time = 1.30, size = 0, normalized size = 0.00

$$\int \frac{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}\right)^2}{d^2-e^2x^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a + b*F^((c*Sqrt[d + e*x])/Sqrt[d*f - e*f*x]))^2/(d^2 - e^2*x^2)
,x]
```

```
[Out] Integrate[(a + b*F^((c*Sqrt[d + e*x])/Sqrt[d*f - e*f*x]))^2/(d^2 - e^2*x^2)
, x]
```

fricas [F] time = 3.68, size = 0, normalized size = 0.00

$$\text{integral}\left(-\frac{a^2+\frac{2\,ab}{F^{\frac{\sqrt{-efx+df}\,\sqrt{ex+d}\,c}{efx-df}}}+\frac{b^2}{F^{\frac{2\,\sqrt{-efx+df}\,\sqrt{ex+d}\,c}{efx-df}}}}{e^2x^2-d^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))^2/(-e^2*x^2+d^2),x,
algorithm="fricas")
```

```
[Out] integral(-(a^2 + 2*a*b/F^(sqrt(-e*f*x + d*f)*sqrt(e*x + d)*c/(e*f*x - d*f))
 + b^2/F^(2*sqrt(-e*f*x + d*f)*sqrt(e*x + d)*c/(e*f*x - d*f)))/(e^2*x^2 - d
^2), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))^2/(-e^2*x^2+d^2),x,
algorithm="giac")
```

```
[Out] Timed out
```

maple [F] time = 0.10, size = 0, normalized size = 0.00

$$\int \frac{\left(b\,F^{\frac{\sqrt{e x+d}\,c}{\sqrt{-e f x+d f}}}+a\right)^{2}}{-e^{2} x^{2}+d^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*F^((e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)*c)+a)^2/(-e^2*x^2+d^2),x)
```

```
[Out] int((b*F^((e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)*c)+a)^2/(-e^2*x^2+d^2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2}\, a^{2} \left(\frac{\log\left(e x+d\right)}{d e}-\frac{\log\left(e x-d\right)}{d e}\right)-b^{2} \int \frac{F^{\frac{2\,\sqrt{e x+d}\,c}{\sqrt{-e x+d}\,\sqrt{f}}}}{e^{2} x^{2}-d^{2}}\, dx-2\, a b \int \frac{F^{\frac{\sqrt{e x+d}\,c}{\sqrt{-e x+d}\,\sqrt{f}}}}{e^{2} x^{2}-d^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))^2/(-e^2*x^2+d^2),x,
algorithm="maxima")
```

```
[Out] 1/2*a^2*(log(e*x + d)/(d*e) - log(e*x - d)/(d*e)) - b^2*integrate(F^(2*sqrt
(e*x + d)*c/(sqrt(-e*x + d)*sqrt(f)))/(e^2*x^2 - d^2), x) - 2*a*b*integrate
(F^(sqrt(e*x + d)*c/(sqrt(-e*x + d)*sqrt(f)))/(e^2*x^2 - d^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(a+b\,\mathrm{e}^{\frac{c\,\ln(F)\,\sqrt{d+e\,x}}{\sqrt{d\,f-e\,f\,x}}}\right)^2}{d^2-e^2\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + F^((c*(d + e*x)^(1/2))/(d*f - e*f*x)^(1/2))*b)^2/(d^2 - e^2*x^2),x
)
```

```
[Out] int((a + b*exp((c*log(F)*(d + e*x)^(1/2))/(d*f - e*f*x)^(1/2)))^2/(d^2 - e^
2*x^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\int \frac{a^2}{-d^2+e^2x^2}\,dx-\int \frac{F^{\frac{2c\sqrt{d+ex}}{\sqrt{df-efx}}}b^2}{-d^2+e^2x^2}\,dx-\int \frac{2F^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}ab}{-d^2+e^2x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F**(c*(e*x+d)**(1/2)/(-e*f*x+d*f)**(1/2)))**2/(-e**2*x**2+d*
*2),x)
```

```
[Out] -Integral(a**2/(-d**2 + e**2*x**2), x) - Integral(F**(2*c*sqrt(d + e*x)/sqr
t(d*f - e*f*x))*b**2/(-d**2 + e**2*x**2), x) - Integral(2*F**(c*sqrt(d + e*
x)/sqrt(d*f - e*f*x))*a*b/(-d**2 + e**2*x**2), x)
```

3.553 $\int \frac{a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}}{d^2-e^2x^2}\,dx$

Optimal. Leaf size=68

$$\frac{a\log\left(\frac{\sqrt{d+ex}}{\sqrt{df-efx}}\right)}{de}+\frac{b\text{Ei}\left(\frac{c\sqrt{d+ex}\log(F)}{\sqrt{df-efx}}\right)}{de}$$

```
[Out] b*Ei(c*ln(F)*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2))/d/e+a*ln((e*x+d)^(1/2)/(-e*f
*x+d*f)^(1/2))/d/e
```

Rubi [A] time = 0.18, antiderivative size = 68, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067, Rules used = {2291, 14, 2178}

$$\frac{a\log\left(\frac{\sqrt{d+ex}}{\sqrt{df-efx}}\right)}{de}+\frac{b\text{Ei}\left(\frac{c\sqrt{d+ex}\log(F)}{\sqrt{df-efx}}\right)}{de}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*F^((c*Sqrt[d + e*x])/Sqrt[d*f - e*f*x]))/(d^2 - e^2*x^2),x]
```

```
[Out] (b*ExpIntegralEi[(c*Sqrt[d + e*x]*Log[F])/Sqrt[d*f - e*f*x]])/(d*e) + (a*Lo
g[Sqrt[d + e*x]/Sqrt[d*f - e*f*x]])/(d*e)
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2178

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - (c*f)/d))*ExpIntegralEi[(f*g*(c + d*x)*Log[F])/d])/d, x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2291

```
Int[((a_.) + (b_.)*(F_)^(((c_.)*Sqrt[(d_.) + (e_.)*(x_)])/Sqrt[(f_.) + (g_.
)*(x_)]))^(n_.)/((A_) + (C_.)*(x_)^2), x_Symbol] :> Dist[(2*e*g)/(C*(e*f -
d*g)), Subst[Int[(a + b*F^(c*x))^n/x, x], x, Sqrt[d + e*x]/Sqrt[f + g*x]],
x] /; FreeQ[{a, b, c, d, e, f, g, A, C, F}, x] && EqQ[C*d*f - A*e*g, 0] &&
```

```
EqQ[e*f + d*g, 0] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}}{d^2-e^2x^2}\,dx = \frac{\text{Subst}\left(\int \frac{a+bF^{cx}}{x}\,dx, x, \frac{\sqrt{d+ex}}{\sqrt{df-efx}}\right)}{de}$$
$$= \frac{\text{Subst}\left(\int \left(\frac{a}{x}+\frac{bF^{cx}}{x}\right)dx, x, \frac{\sqrt{d+ex}}{\sqrt{df-efx}}\right)}{de}$$
$$= \frac{a\log\left(\frac{\sqrt{d+ex}}{\sqrt{df-efx}}\right)}{de} + \frac{b\,\text{Subst}\left(\int \frac{F^{cx}}{x}\,dx, x, \frac{\sqrt{d+ex}}{\sqrt{df-efx}}\right)}{de}$$
$$= \frac{b\text{Ei}\left(\frac{c\sqrt{d+ex}\log(F)}{\sqrt{df-efx}}\right)}{de} + \frac{a\log\left(\frac{\sqrt{d+ex}}{\sqrt{df-efx}}\right)}{de}$$

Mathematica [F] time = 0.46, size = 0, normalized size = 0.00

$$\int \frac{a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}}{d^2-e^2x^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a + b*F^((c*Sqrt[d + e*x])/Sqrt[d*f - e*f*x]))/(d^2 - e^2*x^2),x
]
```

```
[Out] Integrate[(a + b*F^((c*Sqrt[d + e*x])/Sqrt[d*f - e*f*x]))/(d^2 - e^2*x^2),
x]
```

fricas [F] time = 2.05, size = 0, normalized size = 0.00

$$\text{integral}\left(-\frac{a+\frac{b}{F^{\frac{\sqrt{-efx+df}\sqrt{ex+d}\,c}{efx-df}}}}{e^2x^2-d^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))/(-e^2*x^2+d^2),x, al
gorithm="fricas")
```

```
[Out] integral(-(a + b/F^(sqrt(-e*f*x + d*f)*sqrt(e*x + d)*c/(e*f*x - d*f)))/(e^2
*x^2 - d^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int -\frac{F^{\frac{\sqrt{ex+d}\,c}{\sqrt{-efx+df}}}b + a}{e^2x^2 - d^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))/(-e^2*x^2+d^2),x, al
gorithm="giac")
```

```
[Out] integrate(-(F^(sqrt(e*x + d)*c/sqrt(-e*f*x + d*f))*b + a)/(e^2*x^2 - d^2),
x)
```

maple [F] time = 0.11, size = 0, normalized size = 0.00

$$\int \frac{b\,F^{\frac{\sqrt{ex+d}\;c}{\sqrt{-efx+df}}} + a}{-e^2x^2 + d^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*F^((e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)*c)+a)/(-e^2*x^2+d^2),x)
```

```
[Out] int((b*F^((e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)*c)+a)/(-e^2*x^2+d^2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2}\,a\left(\frac{\log\left(ex+d\right)}{de} - \frac{\log\left(ex-d\right)}{de}\right) - b\int \frac{F^{\frac{\sqrt{ex+d}\,c}{\sqrt{-ex+d}\,\sqrt{f}}}}{e^2x^2 - d^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))/(-e^2*x^2+d^2),x, al
gorithm="maxima")
```

```
[Out] 1/2*a*(log(e*x + d)/(d*e) - log(e*x - d)/(d*e)) - b*integrate(F^(sqrt(e*x +
 d)*c/(sqrt(-e*x + d)*sqrt(f)))/(e^2*x^2 - d^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a + b\,\mathrm{e}^{\frac{c\,\ln(F)\,\sqrt{d+e\,x}}{\sqrt{d\,f-e\,f\,x}}}}{d^2 - e^2\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + F^((c*(d + e*x)^(1/2))/(d*f - e*f*x)^(1/2))*b)/(d^2 - e^2*x^2),x)
```

```
[Out] int((a + b*exp((c*log(F)*(d + e*x)^(1/2))/(d*f - e*f*x)^(1/2)))/(d^2 - e^2*
x^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\int \frac{a}{-d^2+e^2x^2}\,dx-\int \frac{F^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}b}{-d^2+e^2x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*F**(c*(e*x+d)**(1/2)/(-e*f*x+d*f)**(1/2)))/(-e**2*x**2+d**2)
,x)
```

```
[Out] -Integral(a/(-d**2 + e**2*x**2), x) - Integral(F**(c*sqrt(d + e*x)/sqrt(d*f
 - e*f*x))*b/(-d**2 + e**2*x**2), x)
```

3.554 $\int \frac{1}{d^2-e^2x^2}\,dx$

Optimal. Leaf size=14

$$\frac{\tanh^{-1}\left(\frac{ex}{d}\right)}{de}$$

```
[Out] arctanh(e*x/d)/d/e
```

Rubi [A] time = 0.01, antiderivative size = 14, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}} =$ 0.071, Rules used = {208}

$$\frac{\tanh^{-1}\left(\frac{ex}{d}\right)}{de}$$

Antiderivative was successfully verified.

```
[In] Int[(d^2 - e^2*x^2)^(-1),x]
```

```
[Out] ArcTanh[(e*x)/d]/(d*e)
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int \frac{1}{d^2-e^2x^2}\,dx = \frac{\tanh^{-1}\left(\frac{ex}{d}\right)}{de}$$

Mathematica [A] time = 0.00, size = 14, normalized size = 1.00

$$\frac{\tanh^{-1}\left(\frac{ex}{d}\right)}{de}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d^2 - e^2*x^2)^(-1),x]
```

```
[Out] ArcTanh[(e*x)/d]/(d*e)
```

fricas [A] time = 0.38, size = 25, normalized size = 1.79

$$\frac{\log\left(ex+d\right)-\log\left(ex-d\right)}{2\,de}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-e^2*x^2+d^2),x, algorithm="fricas")
```

```
[Out] 1/2*(log(e*x + d) - log(e*x - d))/(d*e)
```

giac [B] time = 0.46, size = 38, normalized size = 2.71

$$-\frac{e^{(-1)}\log\left(\frac{|2\,xe^2-2\,|d||e||}{|2\,xe^2+2\,|d||e||}\right)}{2\,|d|}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-e^2*x^2+d^2),x, algorithm="giac")
```

```
[Out] -1/2*e^(-1)*log(abs(2*x*e^2 - 2*abs(d)*e)/abs(2*x*e^2 + 2*abs(d)*e))/abs(d)
```

maple [B] time = 0.01, size = 32, normalized size = 2.29

$$-\frac{\ln(ex-d)}{2de}+\frac{\ln(ex+d)}{2de}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-e^2*x^2+d^2),x)
```

```
[Out] -1/2/d/e*ln(e*x-d)+1/2/d/e*ln(e*x+d)
```

maxima [B] time = 0.96, size = 31, normalized size = 2.21

$$\frac{\log(ex+d)}{2\,de}-\frac{\log(ex-d)}{2\,de}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-e^2*x^2+d^2),x, algorithm="maxima")
```

```
[Out] 1/2*log(e*x + d)/(d*e) - 1/2*log(e*x - d)/(d*e)
```

mupad [B] time = 3.43, size = 14, normalized size = 1.00

$$\frac{\mathrm{atanh}\left(\frac{e\,x}{d}\right)}{d\,e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(d^2 - e^2*x^2),x)
```

```
[Out] atanh((e*x)/d)/(d*e)
```

sympy [B] time = 0.14, size = 20, normalized size = 1.43

$$-\frac{\frac{\log\left(-\frac{d}{e}+x\right)}{2}-\frac{\log\left(\frac{d}{e}+x\right)}{2}}{de}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-e**2*x**2+d**2),x)
[Out] -(log(-d/e + x)/2 - log(d/e + x)/2)/(d*e)
```

3.555 $\int \frac{1}{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}\right)(d^2-e^2x^2)}\,dx$

Optimal. Leaf size=50

$$\text{Int}\left(\frac{1}{(d^2-e^2x^2)\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}\right)},x\right)$$

[Out] Unintegrable(1/(a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))/(-e^2*x^2+d^2), x)

Rubi [A] time = 0.23, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}\right)(d^2-e^2x^2)}\,dx$$

Verification is Not applicable to the result.

[In] Int[1/((a + b*F^((c*Sqrt[d + e*x])/Sqrt[d*f - e*f*x]))*(d^2 - e^2*x^2)),x]

[Out] Defer[Int][1/((a + b*F^((c*Sqrt[d + e*x])/Sqrt[d*f - e*f*x]))*(d^2 - e^2*x^2)), x]

Rubi steps

$$\int \frac{1}{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}\right)(d^2-e^2x^2)}\,dx=\int \frac{1}{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}\right)(d^2-e^2x^2)}\,dx$$

Mathematica [A] time = 0.48, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}\right)(d^2-e^2x^2)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((a + b*F^((c*Sqrt[d + e*x])/Sqrt[d*f - e*f*x]))*(d^2 - e^2*x^2
)),x]
```

```
[Out] Integrate[1/((a + b*F^((c*Sqrt[d + e*x])/Sqrt[d*f - e*f*x]))*(d^2 - e^2*x^2
)), x]
```

fricas [A] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(-\frac{1}{ae^2x^2 - ad^2 + \frac{be^2x^2 - bd^2}{F^{\frac{\sqrt{-efx+df}\sqrt{ex+d}\,c}{efx-df}}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))/(-e^2*x^2+d^2),x,
algorithm="fricas")
```

```
[Out] integral(-1/(a*e^2*x^2 - a*d^2 + (b*e^2*x^2 - b*d^2)/F^(sqrt(-e*f*x + d*f)*
sqrt(e*x + d)*c/(e*f*x - d*f))), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))/(-e^2*x^2+d^2),x,
algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.11, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(b\,F^{\frac{\sqrt{ex+d}\,c}{\sqrt{-efx+df}}} + a\right)\left(-e^2x^2 + d^2\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*F^((e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)*c)+a)/(-e^2*x^2+d^2),x)
```

```
[Out] int(1/(b*F^((e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)*c)+a)/(-e^2*x^2+d^2),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\int \frac{1}{\left(e^2x^2-d^2\right)\left(F^{\frac{\sqrt{ex+d}\,c}{\sqrt{-efx+df}}}b+a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))/(-e^2*x^2+d^2),x,
algorithm="maxima")
```

```
[Out] -integrate(1/((e^2*x^2 - d^2)*(F^(sqrt(e*x + d)*c/sqrt(-e*f*x + d*f))*b + a
)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{1}{\left(d^2-e^2\,x^2\right)\,\left(a+b\,\mathrm{e}^{\frac{c\,\ln(F)\,\sqrt{d+e\,x}}{\sqrt{d\,f-e\,f\,x}}}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((d^2 - e^2*x^2)*(a + F^((c*(d + e*x)^(1/2))/(d*f - e*f*x)^(1/2))*b))
,x)
```

```
[Out] int(1/((d^2 - e^2*x^2)*(a + b*exp((c*log(F)*(d + e*x)^(1/2))/(d*f - e*f*x)^
(1/2)))), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$-\int \frac{1}{-F^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}bd^2+F^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}be^2x^2-ad^2+ae^2x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*F**(c*(e*x+d)**(1/2)/(-e*f*x+d*f)**(1/2)))/(-e**2*x**2+d**
2),x)
```

```
[Out] -Integral(1/(-F**(c*sqrt(d + e*x)/sqrt(d*f - e*f*x))*b*d**2 + F**(c*sqrt(d
+ e*x)/sqrt(d*f - e*f*x))*b*e**2*x**2 - a*d**2 + a*e**2*x**2), x)
```

3.556 $\int \frac{1}{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}\right)^2 (d^2-e^2x^2)}\,dx$

Optimal. Leaf size=50

$$\operatorname{Int}\left(\frac{1}{(d^2-e^2x^2)\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}\right)^2},x\right)$$

```
[Out] Unintegrable(1/(a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))^2/(-e^2*x^2+d^2
),x)
```

Rubi [A] time = 0.22, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}\right)^2 (d^2-e^2x^2)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a + b*F^((c*Sqrt[d + e*x])/Sqrt[d*f - e*f*x]))^2*(d^2 - e^2*x^2)),x
]
```

```
[Out] Defer[Int][1/((a + b*F^((c*Sqrt[d + e*x])/Sqrt[d*f - e*f*x]))^2*(d^2 - e^2*
x^2)), x]
```

Rubi steps

$$\int \frac{1}{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}\right)^2 (d^2-e^2x^2)}\,dx = \int \frac{1}{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}\right)^2 (d^2-e^2x^2)}\,dx$$

Mathematica [A] time = 1.40, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a+bF^{\frac{c\sqrt{d+ex}}{\sqrt{df-efx}}}\right)^2(d^2-e^2x^2)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((a + b*F^((c*Sqrt[d + e*x])/Sqrt[d*f - e*f*x]))^2*(d^2 - e^2*x
^2)),x]
```

```
[Out] Integrate[1/((a + b*F^((c*Sqrt[d + e*x])/Sqrt[d*f - e*f*x]))^2*(d^2 - e^2*x
^2)), x]
```

fricas [A] time = 3.65, size = 0, normalized size = 0.00

$$\text{integral}\left(-\frac{1}{a^2e^2x^2-a^2d^2+\frac{2\left(abe^2x^2-abd^2\right)}{F^{\frac{\sqrt{-efx+df}\,\sqrt{ex+d}\,c}{efx-df}}}+\frac{b^2e^2x^2-b^2d^2}{F^{\frac{2\sqrt{-efx+df}\,\sqrt{ex+d}\,c}{efx-df}}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))^2/(-e^2*x^2+d^2),x
, algorithm="fricas")
```

```
[Out] integral(-1/(a^2*e^2*x^2 - a^2*d^2 + 2*(a*b*e^2*x^2 - a*b*d^2)/F^(sqrt(-e*f
*x + d*f)*sqrt(e*x + d)*c/(e*f*x - d*f)) + (b^2*e^2*x^2 - b^2*d^2)/F^(2*sqr
t(-e*f*x + d*f)*sqrt(e*x + d)*c/(e*f*x - d*f))), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))^2/(-e^2*x^2+d^2),x
, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.10, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(b\,F^{\frac{\sqrt{ex+d}\,c}{\sqrt{-efx+df}}}+a\right)^2\left(-e^2x^2+d^2\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*F^((e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)*c)+a)^2/(-e^2*x^2+d^2),x)
```

```
[Out] int(1/(b*F^((e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)*c)+a)^2/(-e^2*x^2+d^2),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\sqrt{-ex+d}\,\sqrt{f}}{\sqrt{ex+d}\,F^{\frac{\sqrt{ex+d}\,c}{\sqrt{-ex+d}\,\sqrt{f}}}abcde\log(F)+\sqrt{ex+d}\,a^2cde\log(F)}-\int\frac{\sqrt{ex+d}\,c\log(F)+\sqrt{-}}{\left(abce^2x^2\log(F)-abcd^2\log(F)\right)\sqrt{ex+d}\,F^{\frac{\sqrt{ex+d}\,c}{\sqrt{-ex+d}\,\sqrt{f}}}+}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*F^(c*(e*x+d)^(1/2)/(-e*f*x+d*f)^(1/2)))^2/(-e^2*x^2+d^2),x
, algorithm="maxima")
```

```
[Out] sqrt(-e*x + d)*sqrt(f)/(sqrt(e*x + d)*F^(sqrt(e*x + d)*c/(sqrt(-e*x + d)*sq
rt(f)))*a*b*c*d*e*log(F) + sqrt(e*x + d)*a^2*c*d*e*log(F)) - integrate((sqr
t(e*x + d)*c*log(F) + sqrt(-e*x + d)*sqrt(f))/((a*b*c*e^2*x^2*log(F) - a*b*
c*d^2*log(F))*sqrt(e*x + d)*F^(sqrt(e*x + d)*c/(sqrt(-e*x + d)*sqrt(f))) +
(a^2*c*e^2*x^2*log(F) - a^2*c*d^2*log(F))*sqrt(e*x + d)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{1}{\left(d^2-e^2\,x^2\right)\,{\left(a+b\,\mathrm{e}^{\frac{c\,\ln(F)\,\sqrt{d+e\,x}}{\sqrt{d\,f-e\,f\,x}}}\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((d^2 - e^2*x^2)*(a + F^((c*(d + e*x)^(1/2))/(d*f - e*f*x)^(1/2))*b)^
2),x)
```

```
[Out] int(1/((d^2 - e^2*x^2)*(a + b*exp((c*log(F)*(d + e*x)^(1/2))/(d*f - e*f*x)^
(1/2)))^2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*F**(c*(e*x+d)**(1/2)/(-e*f*x+d*f)**(1/2)))**2/(-e**2*x**2+
d**2),x)
```

```
[Out] Timed out
```

3.557 $\int \frac{\left(F^{\frac{\sqrt{1-ax}}{\sqrt{1+ax}}}\right)^n}{1-a^2x^2}\,dx$

Optimal. Leaf size=77

$$-\frac{F^{-\frac{n\sqrt{1-ax}}{\sqrt{ax+1}}}\left(F^{\frac{\sqrt{1-ax}}{\sqrt{ax+1}}}\right)^n \operatorname{Ei}\left(\frac{n\sqrt{1-ax}\log(F)}{\sqrt{ax+1}}\right)}{a}$$

```
[Out] -(F^((-a*x+1)^(1/2)/(a*x+1)^(1/2)))^n*Ei(n*ln(F)*(-a*x+1)^(1/2)/(a*x+1)^(1/
2))/a/(F^(n*(-a*x+1)^(1/2)/(a*x+1)^(1/2)))
```

Rubi [A] time = 0.24, antiderivative size = 77, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.081, Rules used = {2281, 2291, 2178}

$$-\frac{F^{-\frac{n\sqrt{1-ax}}{\sqrt{ax+1}}}\left(F^{\frac{\sqrt{1-ax}}{\sqrt{ax+1}}}\right)^n \operatorname{Ei}\left(\frac{n\sqrt{1-ax}\log(F)}{\sqrt{ax+1}}\right)}{a}$$

Antiderivative was successfully verified.

```
[In] Int[(F^(Sqrt[1 - a*x]/Sqrt[1 + a*x]))^n/(1 - a^2*x^2),x]
```

```
[Out] -(((F^(Sqrt[1 - a*x]/Sqrt[1 + a*x]))^n*ExpIntegralEi[(n*Sqrt[1 - a*x]*Log[F
])/Sqrt[1 + a*x]])/(a*F^((n*Sqrt[1 - a*x])/Sqrt[1 + a*x])))
```

Rule 2178

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - (c*f)/d))*ExpIntegralEi[(f*g*(c + d*x)*Log[F])/d])/d, x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2281

```
Int[(u_.)*((a_.)*(F_)^(v_))^(n_), x_Symbol] :> Dist[(a*F^v)^n/F^(n*v), Int[
u*F^(n*v), x], x] /; FreeQ[{F, a, n}, x] &&  !IntegerQ[n]
```

Rule 2291

```
Int[((a_.) + (b_.)*(F_)^(((c_.)*Sqrt[(d_.) + (e_.)*(x_)])/Sqrt[(f_.) + (g_.
)*(x_)]))^(n_.)/((A_) + (C_.)*(x_)^2), x_Symbol] :> Dist[(2*e*g)/(C*(e*f -
```

```
d*g)), Subst[Int[(a + b*F^(c*x))^n/x, x], x, Sqrt[d + e*x]/Sqrt[f + g*x]],
x] /; FreeQ[{a, b, c, d, e, f, g, A, C, F}, x] && EqQ[C*d*f - A*e*g, 0] &&
EqQ[e*f + d*g, 0] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{\left(F^{\frac{\sqrt{1-ax}}{\sqrt{1+ax}}}\right)^n}{1-a^2x^2}\,dx = \left(F^{-\frac{n\sqrt{1-ax}}{\sqrt{1+ax}}}\left(F^{\frac{\sqrt{1-ax}}{\sqrt{1+ax}}}\right)^n\right)\int \frac{F^{\frac{n\sqrt{1-ax}}{\sqrt{1+ax}}}}{1-a^2x^2}\,dx$$

$$= -\frac{\left(F^{-\frac{n\sqrt{1-ax}}{\sqrt{1+ax}}}\left(F^{\frac{\sqrt{1-ax}}{\sqrt{1+ax}}}\right)^n\right)\text{Subst}\left(\int \frac{F^{nx}}{x}\,dx, x, \frac{\sqrt{1-ax}}{\sqrt{1+ax}}\right)}{a}$$

$$= -\frac{F^{-\frac{n\sqrt{1-ax}}{\sqrt{1+ax}}}\left(F^{\frac{\sqrt{1-ax}}{\sqrt{1+ax}}}\right)^n \text{Ei}\left(\frac{n\sqrt{1-ax}\,\log(F)}{\sqrt{1+ax}}\right)}{a}$$

Mathematica [A] time = 0.32, size = 77, normalized size = 1.00

$$-\frac{F^{-\frac{n\sqrt{1-ax}}{\sqrt{ax+1}}}\left(F^{\frac{\sqrt{1-ax}}{\sqrt{ax+1}}}\right)^n \text{Ei}\left(\frac{n\sqrt{1-ax}\,\log(F)}{\sqrt{ax+1}}\right)}{a}$$

Antiderivative was successfully verified.

```
[In] Integrate[(F^(Sqrt[1 - a*x]/Sqrt[1 + a*x]))^n/(1 - a^2*x^2),x]
```

```
[Out] -(((F^(Sqrt[1 - a*x]/Sqrt[1 + a*x]))^n*ExpIntegralEi[(n*Sqrt[1 - a*x]*Log[F
])/Sqrt[1 + a*x]])/(a*F^((n*Sqrt[1 - a*x])/Sqrt[1 + a*x])))
```

fricas [A] time = 0.73, size = 25, normalized size = 0.32

$$-\frac{\text{Ei}\left(\frac{\sqrt{-ax+1}\,n\log(F)}{\sqrt{ax+1}}\right)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((F^((-a*x+1)^(1/2)/(a*x+1)^(1/2)))^n/(-a^2*x^2+1),x, algorithm="f
ricas")
```

```
[Out] -Ei(sqrt(-a*x + 1)*n*log(F)/sqrt(a*x + 1))/a
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int -\frac{\left(F^{\frac{\sqrt{-ax+1}}{\sqrt{ax+1}}}\right)^n}{a^2x^2-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((F^((-a*x+1)^(1/2)/(a*x+1)^(1/2)))^n/(-a^2*x^2+1),x, algorithm="g
iac")
```

```
[Out] integrate(-(F^(sqrt(-a*x + 1)/sqrt(a*x + 1)))^n/(a^2*x^2 - 1), x)
```

maple [F] time = 0.11, size = 0, normalized size = 0.00

$$\int \frac{\left(F^{\frac{\sqrt{-ax+1}}{\sqrt{ax+1}}}\right)^n}{-a^2x^2+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((F^((-a*x+1)^(1/2)/(a*x+1)^(1/2)))^n/(-a^2*x^2+1),x)
```

```
[Out] int((F^((-a*x+1)^(1/2)/(a*x+1)^(1/2)))^n/(-a^2*x^2+1),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\int \frac{\left(F^{\frac{\sqrt{-ax+1}}{\sqrt{ax+1}}}\right)^n}{a^2x^2-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((F^((-a*x+1)^(1/2)/(a*x+1)^(1/2)))^n/(-a^2*x^2+1),x, algorithm="m
axima")
```

```
[Out] -integrate((F^(sqrt(-a*x + 1)/sqrt(a*x + 1)))^n/(a^2*x^2 - 1), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int -\frac{\left(F^{\frac{\sqrt{1-a\,x}}{\sqrt{a\,x+1}}}\right)^n}{a^2\,x^2-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-(F^((1 - a*x)^(1/2)/(a*x + 1)^(1/2)))^n/(a^2*x^2 - 1),x)
```

```
[Out] int(-(F^((1 - a*x)^(1/2)/(a*x + 1)^(1/2)))^n/(a^2*x^2 - 1), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\int \frac{\left(F^{\frac{\sqrt{-ax+1}}{\sqrt{ax+1}}}\right)^{n}}{a^{2}x^{2}-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((F**((-a*x+1)**(1/2)/(a*x+1)**(1/2)))**n/(-a**2*x**2+1),x)
```

```
[Out] -Integral((F**(sqrt(-a*x + 1)/sqrt(a*x + 1)))**n/(a**2*x**2 - 1), x)
```

3.558 $\int \frac{F^{\frac{3\sqrt{1-ax}}{\sqrt{1+ax}}}}{1-a^2x^2}\,dx$

Optimal. Leaf size=29

$$-\frac{\text{Ei}\left(\frac{3\sqrt{1-ax}\log(F)}{\sqrt{ax+1}}\right)}{a}$$

```
[Out] -Ei(3*ln(F)*(-a*x+1)^(1/2)/(a*x+1)^(1/2))/a
```

Rubi [A] time = 0.11, antiderivative size = 29, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 36, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.056, Rules used = {2291, 2178}

$$-\frac{\text{Ei}\left(\frac{3\sqrt{1-ax}\log(F)}{\sqrt{ax+1}}\right)}{a}$$

Antiderivative was successfully verified.

```
[In] Int[F^((3*Sqrt[1 - a*x])/Sqrt[1 + a*x])/(1 - a^2*x^2),x]
```

```
[Out] -(ExpIntegralEi[(3*Sqrt[1 - a*x]*Log[F])/Sqrt[1 + a*x]]/a)
```

Rule 2178

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - (c*f)/d))*ExpIntegralEi[(f*g*(c + d*x)*Log[F])/d])/d, x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2291

```
Int[((a_.) + (b_.)*(F_)^(((c_.)*Sqrt[(d_.) + (e_.)*(x_)])/Sqrt[(f_.) + (g_.
)*(x_)]))^(n_.)/((A_) + (C_.)*(x_)^2), x_Symbol] :> Dist[(2*e*g)/(C*(e*f -
d*g)), Subst[Int[(a + b*F^(c*x))^n/x, x], x, Sqrt[d + e*x]/Sqrt[f + g*x]],
x] /; FreeQ[{a, b, c, d, e, f, g, A, C, F}, x] && EqQ[C*d*f - A*e*g, 0] &&
EqQ[e*f + d*g, 0] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{F^{\frac{3\sqrt{1-ax}}{\sqrt{1+ax}}}}{1-a^2x^2}\,dx = -\frac{\text{Subst}\left(\int \frac{F^{3x}}{x}\,dx, x, \frac{\sqrt{1-ax}}{\sqrt{1+ax}}\right)}{a}$$
$$= -\frac{\text{Ei}\left(\frac{3\sqrt{1-ax}\log(F)}{\sqrt{1+ax}}\right)}{a}$$

Mathematica [A] time = 0.26, size = 29, normalized size = 1.00

$$-\frac{\text{Ei}\left(\frac{3\sqrt{1-ax}\log(F)}{\sqrt{ax+1}}\right)}{a}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^((3*Sqrt[1 - a*x])/Sqrt[1 + a*x])/(1 - a^2*x^2),x]
[Out] -(ExpIntegralEi[(3*Sqrt[1 - a*x]*Log[F])/Sqrt[1 + a*x]]/a)
```

fricas [A] time = 0.62, size = 25, normalized size = 0.86

$$-\frac{\text{Ei}\left(\frac{3\sqrt{-ax+1}\log(F)}{\sqrt{ax+1}}\right)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(3*(-a*x+1)^(1/2)/(a*x+1)^(1/2))/(-a^2*x^2+1),x, algorithm="fri
cas")
[Out] -Ei(3*sqrt(-a*x + 1)*log(F)/sqrt(a*x + 1))/a
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int -\frac{F^{\frac{3\sqrt{-ax+1}}{\sqrt{ax+1}}}}{a^2x^2-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(3*(-a*x+1)^(1/2)/(a*x+1)^(1/2))/(-a^2*x^2+1),x, algorithm="gia
c")
[Out] integrate(-F^(3*sqrt(-a*x + 1)/sqrt(a*x + 1))/(a^2*x^2 - 1), x)
```

maple [F] time = 0.10, size = 0, normalized size = 0.00

$$\int \frac{F^{\frac{3\sqrt{-ax+1}}{\sqrt{ax+1}}}}{-a^2x^2+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(3*(-a*x+1)^(1/2)/(a*x+1)^(1/2))/(-a^2*x^2+1),x)
```

```
[Out] int(F^(3*(-a*x+1)^(1/2)/(a*x+1)^(1/2))/(-a^2*x^2+1),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\int \frac{F^{\frac{3\sqrt{-ax+1}}{\sqrt{ax+1}}}}{a^2x^2-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(3*(-a*x+1)^(1/2)/(a*x+1)^(1/2))/(-a^2*x^2+1),x, algorithm="max
ima")
```

```
[Out] -integrate(F^(3*sqrt(-a*x + 1)/sqrt(a*x + 1))/(a^2*x^2 - 1), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.03

$$\int -\frac{F^{\frac{3\sqrt{1-a\,x}}{\sqrt{a\,x+1}}}}{a^2\,x^2-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-F^((3*(1 - a*x)^(1/2))/(a*x + 1)^(1/2))/(a^2*x^2 - 1),x)
```

```
[Out] int(-F^((3*(1 - a*x)^(1/2))/(a*x + 1)^(1/2))/(a^2*x^2 - 1), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\int \frac{F^{\frac{3\sqrt{-ax+1}}{\sqrt{ax+1}}}}{a^2x^2-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(3*(-a*x+1)**(1/2)/(a*x+1)**(1/2))/(-a**2*x**2+1),x)
```

```
[Out] -Integral(F**(3*sqrt(-a*x + 1)/sqrt(a*x + 1))/(a**2*x**2 - 1), x)
```

3.559 $\int \frac{F^{\frac{2\sqrt{1-ax}}{\sqrt{1+ax}}}}{1-a^2x^2}\,dx$

Optimal. Leaf size=29

$$-\frac{\text{Ei}\left(\frac{2\sqrt{1-ax}\,\log(F)}{\sqrt{ax+1}}\right)}{a}$$

[Out] -Ei(2*ln(F)*(-a*x+1)^(1/2)/(a*x+1)^(1/2))/a

Rubi [A] time = 0.11, antiderivative size = 29, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 36, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.056, Rules used = {2291, 2178}

$$-\frac{\text{Ei}\left(\frac{2\sqrt{1-ax}\,\log(F)}{\sqrt{ax+1}}\right)}{a}$$

Antiderivative was successfully verified.

[In] Int[F^((2*Sqrt[1 - a*x])/Sqrt[1 + a*x])/(1 - a^2*x^2),x]

[Out] -(ExpIntegralEi[(2*Sqrt[1 - a*x]*Log[F])/Sqrt[1 + a*x]]/a)

Rule 2178

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - (c*f)/d))*ExpIntegralEi[(f*g*(c + d*x)*Log[F])/d])/d, x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2291

```
Int[((a_.) + (b_.)*(F_)^(((c_.)*Sqrt[(d_.) + (e_.)*(x_)])/Sqrt[(f_.) + (g_.
)*(x_)]))^(n_.)/((A_) + (C_.)*(x_)^2), x_Symbol] :> Dist[(2*e*g)/(C*(e*f -
d*g)), Subst[Int[(a + b*F^(c*x))^n/x, x], x, Sqrt[d + e*x]/Sqrt[f + g*x]],
x] /; FreeQ[{a, b, c, d, e, f, g, A, C, F}, x] && EqQ[C*d*f - A*e*g, 0] &&
EqQ[e*f + d*g, 0] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{F^{\frac{2\sqrt{1-ax}}{\sqrt{1+ax}}}}{1-a^2x^2}\,dx = -\frac{\text{Subst}\left(\int \frac{F^{2x}}{x}\,dx, x, \frac{\sqrt{1-ax}}{\sqrt{1+ax}}\right)}{a}$$
$$= -\frac{\text{Ei}\left(\frac{2\sqrt{1-ax}\log(F)}{\sqrt{1+ax}}\right)}{a}$$

Mathematica [A] time = 0.25, size = 29, normalized size = 1.00

$$-\frac{\text{Ei}\left(\frac{2\sqrt{1-ax}\log(F)}{\sqrt{ax+1}}\right)}{a}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^((2*Sqrt[1 - a*x])/Sqrt[1 + a*x])/(1 - a^2*x^2),x]
[Out] -(ExpIntegralEi[(2*Sqrt[1 - a*x]*Log[F])/Sqrt[1 + a*x]]/a)
```

fricas [A] time = 0.61, size = 25, normalized size = 0.86

$$-\frac{\text{Ei}\left(\frac{2\sqrt{-ax+1}\log(F)}{\sqrt{ax+1}}\right)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(2*(-a*x+1)^(1/2)/(a*x+1)^(1/2))/(-a^2*x^2+1),x, algorithm="fri
cas")
[Out] -Ei(2*sqrt(-a*x + 1)*log(F)/sqrt(a*x + 1))/a
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int -\frac{F^{\frac{2\sqrt{-ax+1}}{\sqrt{ax+1}}}}{a^2x^2-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(2*(-a*x+1)^(1/2)/(a*x+1)^(1/2))/(-a^2*x^2+1),x, algorithm="gia
c")
[Out] integrate(-F^(2*sqrt(-a*x + 1)/sqrt(a*x + 1))/(a^2*x^2 - 1), x)
```

maple [F] time = 0.10, size = 0, normalized size = 0.00

$$\int \frac{F^{\frac{2\sqrt{-ax+1}}{\sqrt{ax+1}}}}{-a^2x^2+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(2*(-a*x+1)^(1/2)/(a*x+1)^(1/2))/(-a^2*x^2+1),x)
```

```
[Out] int(F^(2*(-a*x+1)^(1/2)/(a*x+1)^(1/2))/(-a^2*x^2+1),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\int \frac{F^{\frac{2\sqrt{-ax+1}}{\sqrt{ax+1}}}}{a^2x^2-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(2*(-a*x+1)^(1/2)/(a*x+1)^(1/2))/(-a^2*x^2+1),x, algorithm="max
ima")
```

```
[Out] -integrate(F^(2*sqrt(-a*x + 1)/sqrt(a*x + 1))/(a^2*x^2 - 1), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.03

$$\int -\frac{F^{\frac{2\sqrt{1-a\,x}}{\sqrt{a\,x+1}}}}{a^2\,x^2-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-F^((2*(1 - a*x)^(1/2))/(a*x + 1)^(1/2))/(a^2*x^2 - 1),x)
```

```
[Out] int(-F^((2*(1 - a*x)^(1/2))/(a*x + 1)^(1/2))/(a^2*x^2 - 1), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\int \frac{F^{\frac{2\sqrt{-ax+1}}{\sqrt{ax+1}}}}{a^2x^2-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(2*(-a*x+1)**(1/2)/(a*x+1)**(1/2))/(-a**2*x**2+1),x)
```

```
[Out] -Integral(F**(2*sqrt(-a*x + 1)/sqrt(a*x + 1))/(a**2*x**2 - 1), x)
```

3.560 $\int \frac{F^{\frac{\sqrt{1-ax}}{\sqrt{1+ax}}}}{1-a^2x^2}\,dx$

Optimal. Leaf size=28

$$-\frac{\text{Ei}\left(\frac{\sqrt{1-ax}\,\log(F)}{\sqrt{ax+1}}\right)}{a}$$

```
[Out] -Ei(ln(F)*(-a*x+1)^(1/2)/(a*x+1)^(1/2))/a
```

Rubi [A] time = 0.10, antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.057, Rules used = {2291, 2178}

$$-\frac{\text{Ei}\left(\frac{\sqrt{1-ax}\,\log(F)}{\sqrt{ax+1}}\right)}{a}$$

Antiderivative was successfully verified.

```
[In] Int[F^(Sqrt[1 - a*x]/Sqrt[1 + a*x])/(1 - a^2*x^2),x]
```

```
[Out] -(ExpIntegralEi[(Sqrt[1 - a*x]*Log[F])/Sqrt[1 + a*x]]/a)
```

Rule 2178

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - (c*f)/d))*ExpIntegralEi[(f*g*(c + d*x)*Log[F])/d])/d, x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2291

```
Int[((a_.) + (b_.)*(F_)^(((c_.)*Sqrt[(d_.) + (e_.)*(x_)])/Sqrt[(f_.) + (g_.
)*(x_)]))^(n_.)/((A_) + (C_.)*(x_)^2), x_Symbol] :> Dist[(2*e*g)/(C*(e*f -
d*g)), Subst[Int[(a + b*F^(c*x))^n/x, x], x, Sqrt[d + e*x]/Sqrt[f + g*x]],
x] /; FreeQ[{a, b, c, d, e, f, g, A, C, F}, x] && EqQ[C*d*f - A*e*g, 0] &&
EqQ[e*f + d*g, 0] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{F^{\frac{\sqrt{1-ax}}{\sqrt{1+ax}}}}{1-a^2x^2}\,dx = -\frac{\text{Subst}\left(\int \frac{F^x}{x}\,dx, x, \frac{\sqrt{1-ax}}{\sqrt{1+ax}}\right)}{a}$$
$$= -\frac{\text{Ei}\left(\frac{\sqrt{1-ax}\,\log(F)}{\sqrt{1+ax}}\right)}{a}$$

Mathematica [A] time = 0.24, size = 28, normalized size = 1.00

$$-\frac{\text{Ei}\left(\frac{\sqrt{1-ax}\,\log(F)}{\sqrt{ax+1}}\right)}{a}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(Sqrt[1 - a*x]/Sqrt[1 + a*x])/(1 - a^2*x^2),x]
```

```
[Out] -(ExpIntegralEi[(Sqrt[1 - a*x]*Log[F])/Sqrt[1 + a*x]]/a)
```

fricas [A] time = 0.63, size = 24, normalized size = 0.86

$$-\frac{\text{Ei}\left(\frac{\sqrt{-ax+1}\,\log(F)}{\sqrt{ax+1}}\right)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^((-a*x+1)^(1/2)/(a*x+1)^(1/2))/(-a^2*x^2+1),x, algorithm="frica
s")
```

```
[Out] -Ei(sqrt(-a*x + 1)*log(F)/sqrt(a*x + 1))/a
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int -\frac{F^{\frac{\sqrt{-ax+1}}{\sqrt{ax+1}}}}{a^2x^2-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^((-a*x+1)^(1/2)/(a*x+1)^(1/2))/(-a^2*x^2+1),x, algorithm="giac"
)
```

```
[Out] integrate(-F^(sqrt(-a*x + 1)/sqrt(a*x + 1))/(a^2*x^2 - 1), x)
```

maple [F] time = 0.10, size = 0, normalized size = 0.00

$$\int \frac{F^{\frac{\sqrt{-ax+1}}{\sqrt{ax+1}}}}{-a^{2}x^{2}+1}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^((-a*x+1)^(1/2)/(a*x+1)^(1/2))/(-a^2*x^2+1),x)
```

```
[Out] int(F^((-a*x+1)^(1/2)/(a*x+1)^(1/2))/(-a^2*x^2+1),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\int \frac{F^{\frac{\sqrt{-ax+1}}{\sqrt{ax+1}}}}{a^{2}x^{2}-1}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^((-a*x+1)^(1/2)/(a*x+1)^(1/2))/(-a^2*x^2+1),x, algorithm="maxim
a")
```

```
[Out] -integrate(F^(sqrt(-a*x + 1)/sqrt(a*x + 1))/(a^2*x^2 - 1), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.04

$$\int -\frac{F^{\frac{\sqrt{1-a\,x}}{\sqrt{a\,x+1}}}}{a^2\,x^2-1}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-F^((1 - a*x)^(1/2)/(a*x + 1)^(1/2))/(a^2*x^2 - 1),x)
```

```
[Out] int(-F^((1 - a*x)^(1/2)/(a*x + 1)^(1/2))/(a^2*x^2 - 1), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\int \frac{F^{\frac{\sqrt{-ax+1}}{\sqrt{ax+1}}}}{a^{2}x^{2}-1}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**((-a*x+1)**(1/2)/(a*x+1)**(1/2))/(-a**2*x**2+1),x)
```

```
[Out] -Integral(F**(sqrt(-a*x + 1)/sqrt(a*x + 1))/(a**2*x**2 - 1), x)
```

3.561 $\int \frac{F^{-\frac{\sqrt{1-ax}}{\sqrt{1+ax}}}}{1-a^2x^2}\,dx$

Optimal. Leaf size=29

$$-\frac{\text{Ei}\left(-\frac{\sqrt{1-ax}\log(F)}{\sqrt{ax+1}}\right)}{a}$$

```
[Out] -Ei(-ln(F)*(-a*x+1)^(1/2)/(a*x+1)^(1/2))/a
```

Rubi [A] time = 0.10, antiderivative size = 29, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 36, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.056, Rules used = {2291, 2178}

$$-\frac{\text{Ei}\left(-\frac{\sqrt{1-ax}\log(F)}{\sqrt{ax+1}}\right)}{a}$$

Antiderivative was successfully verified.

```
[In] Int[1/(F^(Sqrt[1 - a*x]/Sqrt[1 + a*x])*(1 - a^2*x^2)),x]
```

```
[Out] -(ExpIntegralEi[-((Sqrt[1 - a*x]*Log[F])/Sqrt[1 + a*x])]/a)
```

Rule 2178

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - (c*f)/d))*ExpIntegralEi[(f*g*(c + d*x)*Log[F])/d])/d, x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2291

```
Int[((a_.) + (b_.)*(F_)^(((c_.)*Sqrt[(d_.) + (e_.)*(x_)])/Sqrt[(f_.) + (g_.
)*(x_)]))^(n_.)/((A_) + (C_.)*(x_)^2), x_Symbol] :> Dist[(2*e*g)/(C*(e*f -
d*g)), Subst[Int[(a + b*F^(c*x))^n/x, x], x, Sqrt[d + e*x]/Sqrt[f + g*x]],
x] /; FreeQ[{a, b, c, d, e, f, g, A, C, F}, x] && EqQ[C*d*f - A*e*g, 0] &&
EqQ[e*f + d*g, 0] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{F^{-\frac{\sqrt{1-ax}}{\sqrt{1+ax}}}}{1-a^2x^2}\,dx = -\frac{\text{Subst}\left(\int \frac{F^{-x}}{x}\,dx, x, \frac{\sqrt{1-ax}}{\sqrt{1+ax}}\right)}{a}$$
$$= -\frac{\text{Ei}\left(-\frac{\sqrt{1-ax}\log(F)}{\sqrt{1+ax}}\right)}{a}$$

Mathematica [A] time = 0.25, size = 29, normalized size = 1.00

$$-\frac{\text{Ei}\left(-\frac{\sqrt{1-ax}\log(F)}{\sqrt{ax+1}}\right)}{a}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(F^(Sqrt[1 - a*x]/Sqrt[1 + a*x])*(1 - a^2*x^2)),x]
```

```
[Out] -(ExpIntegralEi[-((Sqrt[1 - a*x]*Log[F])/Sqrt[1 + a*x])]/a)
```

fricas [F] time = 0.61, size = 0, normalized size = 0.00

$$\text{integral}\left(-\frac{1}{\left(a^2x^2-1\right)F^{\frac{\sqrt{-ax+1}}{\sqrt{ax+1}}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(F^((-a*x+1)^(1/2)/(a*x+1)^(1/2)))/(-a^2*x^2+1),x, algorithm="f
ricas")
```

```
[Out] integral(-1/((a^2*x^2 - 1)*F^(sqrt(-a*x + 1)/sqrt(a*x + 1))), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int -\frac{1}{\left(a^2x^2-1\right)F^{\frac{\sqrt{-ax+1}}{\sqrt{ax+1}}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(F^((-a*x+1)^(1/2)/(a*x+1)^(1/2)))/(-a^2*x^2+1),x, algorithm="g
iac")
```

```
[Out] integrate(-1/((a^2*x^2 - 1)*F^(sqrt(-a*x + 1)/sqrt(a*x + 1))), x)
```

maple [F] time = 0.10, size = 0, normalized size = 0.00

$$\int \frac{F^{-\frac{\sqrt{-ax+1}}{\sqrt{ax+1}}}}{-a^{2}x^{2}+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(F^((-a*x+1)^(1/2)/(a*x+1)^(1/2)))/(-a^2*x^2+1),x)
[Out] int(1/(F^((-a*x+1)^(1/2)/(a*x+1)^(1/2)))/(-a^2*x^2+1),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\int \frac{1}{\left(a^{2}x^{2}-1\right)F^{\frac{\sqrt{-ax+1}}{\sqrt{ax+1}}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(F^((-a*x+1)^(1/2)/(a*x+1)^(1/2)))/(-a^2*x^2+1),x, algorithm="m
axima")
[Out] -integrate(1/((a^2*x^2 - 1)*F^(sqrt(-a*x + 1)/sqrt(a*x + 1))), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.03

$$\int -\frac{1}{F^{\frac{\sqrt{1-a\,x}}{\sqrt{a\,x+1}}}\,\left(a^{2}\,x^{2}-1\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-1/(F^((1 - a*x)^(1/2)/(a*x + 1)^(1/2))*(a^2*x^2 - 1)),x)
[Out] int(-1/(F^((1 - a*x)^(1/2)/(a*x + 1)^(1/2))*(a^2*x^2 - 1)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\int \frac{1}{F^{\frac{\sqrt{-ax+1}}{\sqrt{ax+1}}}a^{2}x^{2}-F^{\frac{\sqrt{-ax+1}}{\sqrt{ax+1}}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(F**((-a*x+1)**(1/2)/(a*x+1)**(1/2)))/(-a**2*x**2+1),x)
[Out] -Integral(1/(F**(sqrt(-a*x + 1)/sqrt(a*x + 1))*a**2*x**2 - F**(sqrt(-a*x +
1)/sqrt(a*x + 1))), x)
```

3.562 $\int \frac{F^{-\frac{2\sqrt{1-ax}}{\sqrt{1+ax}}}}{1-a^2x^2}\,dx$

Optimal. Leaf size=29

$$-\frac{\mathrm{Ei}\left(-\frac{2\sqrt{1-ax}\,\log(F)}{\sqrt{ax+1}}\right)}{a}$$

```
[Out] -Ei(-2*ln(F)*(-a*x+1)^(1/2)/(a*x+1)^(1/2))/a
```

Rubi [A] time = 0.10, antiderivative size = 29, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 36, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.056, Rules used = {2291, 2178}

$$-\frac{\mathrm{Ei}\left(-\frac{2\sqrt{1-ax}\,\log(F)}{\sqrt{ax+1}}\right)}{a}$$

Antiderivative was successfully verified.

```
[In] Int[1/(F^((2*Sqrt[1 - a*x])/Sqrt[1 + a*x])*(1 - a^2*x^2)),x]
```

```
[Out] -(ExpIntegralEi[(-2*Sqrt[1 - a*x]*Log[F])/Sqrt[1 + a*x]]/a)
```

Rule 2178

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - (c*f)/d))*ExpIntegralEi[(f*g*(c + d*x)*Log[F])/d])/d, x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2291

```
Int[((a_.) + (b_.)*(F_)^(((c_.)*Sqrt[(d_.) + (e_.)*(x_)])/Sqrt[(f_.) + (g_.
)*(x_)]))^(n_.)/((A_) + (C_.)*(x_)^2), x_Symbol] :> Dist[(2*e*g)/(C*(e*f -
d*g)), Subst[Int[(a + b*F^(c*x))^n/x, x], x, Sqrt[d + e*x]/Sqrt[f + g*x]],
x] /; FreeQ[{a, b, c, d, e, f, g, A, C, F}, x] && EqQ[C*d*f - A*e*g, 0] &&
EqQ[e*f + d*g, 0] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{F^{-\frac{2\sqrt{1-ax}}{\sqrt{1+ax}}}}{1-a^2x^2}\,dx = -\frac{\text{Subst}\left(\int \frac{F^{-2x}}{x}\,dx, x, \frac{\sqrt{1-ax}}{\sqrt{1+ax}}\right)}{a}$$
$$= -\frac{\text{Ei}\left(-\frac{2\sqrt{1-ax}\log(F)}{\sqrt{1+ax}}\right)}{a}$$

Mathematica [A] time = 0.30, size = 29, normalized size = 1.00

$$-\frac{\text{Ei}\left(-\frac{2\sqrt{1-ax}\log(F)}{\sqrt{ax+1}}\right)}{a}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(F^((2*Sqrt[1 - a*x])/Sqrt[1 + a*x])*(1 - a^2*x^2)),x]
[Out] -(ExpIntegralEi[(-2*Sqrt[1 - a*x]*Log[F])/Sqrt[1 + a*x]]/a)
```

fricas [F] time = 1.13, size = 0, normalized size = 0.00

$$\text{integral}\left(-\frac{1}{\left(a^2x^2-1\right)F^{\frac{2\sqrt{-ax+1}}{\sqrt{ax+1}}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(F^(2*(-a*x+1)^(1/2)/(a*x+1)^(1/2)))/(-a^2*x^2+1),x, algorithm=
"fricas")
[Out] integral(-1/((a^2*x^2 - 1)*F^(2*sqrt(-a*x + 1)/sqrt(a*x + 1))), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int -\frac{1}{\left(a^2x^2-1\right)F^{\frac{2\sqrt{-ax+1}}{\sqrt{ax+1}}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(F^(2*(-a*x+1)^(1/2)/(a*x+1)^(1/2)))/(-a^2*x^2+1),x, algorithm=
"giac")
[Out] integrate(-1/((a^2*x^2 - 1)*F^(2*sqrt(-a*x + 1)/sqrt(a*x + 1))), x)
```

maple [F] time = 0.10, size = 0, normalized size = 0.00

$$\int \frac{F^{-\frac{2\sqrt{-ax+1}}{\sqrt{ax+1}}}}{-a^{2}x^{2}+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(F^(2*(-a*x+1)^(1/2)/(a*x+1)^(1/2)))/(-a^2*x^2+1),x)
```

```
[Out] int(1/(F^(2*(-a*x+1)^(1/2)/(a*x+1)^(1/2)))/(-a^2*x^2+1),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\int \frac{1}{\left(a^{2}x^{2}-1\right)F^{\frac{2\sqrt{-ax+1}}{\sqrt{ax+1}}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(F^(2*(-a*x+1)^(1/2)/(a*x+1)^(1/2)))/(-a^2*x^2+1),x, algorithm=
"maxima")
```

```
[Out] -integrate(1/((a^2*x^2 - 1)*F^(2*sqrt(-a*x + 1)/sqrt(a*x + 1))), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.03

$$\int -\frac{1}{F^{\frac{2\sqrt{1-a\,x}}{\sqrt{a\,x+1}}}\,\left(a^{2}\,x^{2}-1\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-1/(F^((2*(1 - a*x)^(1/2))/(a*x + 1)^(1/2))*(a^2*x^2 - 1)),x)
```

```
[Out] int(-1/(F^((2*(1 - a*x)^(1/2))/(a*x + 1)^(1/2))*(a^2*x^2 - 1)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\int \frac{1}{F^{\frac{2\sqrt{-ax+1}}{\sqrt{ax+1}}}a^{2}x^{2}-F^{\frac{2\sqrt{-ax+1}}{\sqrt{ax+1}}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(F**(2*(-a*x+1)**(1/2)/(a*x+1)**(1/2)))/(-a**2*x**2+1),x)
```

```
[Out] -Integral(1/(F**(2*sqrt(-a*x + 1)/sqrt(a*x + 1))*a**2*x**2 - F**(2*sqrt(-a*
x + 1)/sqrt(a*x + 1))), x)
```

3.563 $\int a^x b^x x^2 \, dx$

Optimal. Leaf size=49

$$\frac{x^2 a^x b^x}{\log(a)+\log(b)}-\frac{2 x a^x b^x}{(\log(a)+\log(b))^2}+\frac{2 a^x b^x}{(\log(a)+\log(b))^3}$$

```
[Out] 2*a^x*b^x/(ln(a)+ln(b))^3-2*a^x*b^x*x/(ln(a)+ln(b))^2+a^x*b^x*x^2/(ln(a)+ln
(b))
```

Rubi [A] time = 0.06, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.300, Rules used = {2287, 2176, 2194}

$$\frac{x^2 a^x b^x}{\log(a)+\log(b)}-\frac{2 x a^x b^x}{(\log(a)+\log(b))^2}+\frac{2 a^x b^x}{(\log(a)+\log(b))^3}$$

Antiderivative was successfully verified.

```
[In] Int[a^x*b^x*x^2,x]
```

```
[Out] (2*a^x*b^x)/(Log[a] + Log[b])^3 - (2*a^x*b^x*x)/(Log[a] + Log[b])^2 + (a^x*
b^x*x^2)/(Log[a] + Log[b])
```

Rule 2176

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_.), x_Symbol] :> Simp[((c + d*x)^m*(b*F^(g*(e + f*x)))^n)/(f*g*n*Log[F]),
x] - Dist[(d*m)/(f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*(b*F^(g*(e + f*x)))^n
, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && GtQ[m, 0] && IntegerQ[2*m
] &&  !$UseGamma === True
```

Rule 2194

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 2287

```
Int[(u_.)*(F_)^(v_)*(G_)^(w_), x_Symbol] :> With[{z = v*Log[F] + w*Log[G]},
 Int[u*NormalizeIntegrand[E^z, x], x] /; BinomialQ[z, x] || (PolynomialQ[z,
 x] && LeQ[Exponent[z, x], 2])] /; FreeQ[{F, G}, x]
```

Rubi steps

$$\int a^x b^x x^2\,dx = \int e^{x(\log(a)+\log(b))}x^2\,dx$$
$$= \frac{a^x b^x x^2}{\log(a)+\log(b)} - \frac{2\int e^{x(\log(a)+\log(b))}x\,dx}{\log(a)+\log(b)}$$
$$= -\frac{2a^x b^x x}{(\log(a)+\log(b))^2} + \frac{a^x b^x x^2}{\log(a)+\log(b)} + \frac{2\int e^{x(\log(a)+\log(b))}\,dx}{(\log(a)+\log(b))^2}$$
$$= \frac{2a^x b^x}{(\log(a)+\log(b))^3} - \frac{2a^x b^x x}{(\log(a)+\log(b))^2} + \frac{a^x b^x x^2}{\log(a)+\log(b)}$$

Mathematica [A] time = 0.03, size = 35, normalized size = 0.71

$$\frac{a^x b^x \left(x^2(\log(a)+\log(b))^2 - 2x(\log(a)+\log(b)) + 2\right)}{(\log(a)+\log(b))^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[a^x*b^x*x^2,x]
```

```
[Out] (a^x*b^x*(2 - 2*x*(Log[a] + Log[b]) + x^2*(Log[a] + Log[b])^2))/(Log[a] + L
og[b])^3
```

fricas [A] time = 0.43, size = 71, normalized size = 1.45

$$\frac{\left(x^2\log(a)^2 + x^2\log(b)^2 - 2\,x\log(a) + 2\left(x^2\log(a) - x\right)\log(b) + 2\right)a^x b^x}{\log(a)^3 + 3\,\log(a)^2\log(b) + 3\,\log(a)\log(b)^2 + \log(b)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x*b^x*x^2,x, algorithm="fricas")
```

```
[Out] (x^2*log(a)^2 + x^2*log(b)^2 - 2*x*log(a) + 2*(x^2*log(a) - x)*log(b) + 2)*
a^x*b^x/(log(a)^3 + 3*log(a)^2*log(b) + 3*log(a)*log(b)^2 + log(b)^3)
```

giac [B] time = 0.85, size = 2679, normalized size = 54.67

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x*b^x*x^2,x, algorithm="giac")
```

```
[Out] ((2*(pi*x^2*log(abs(a))*sgn(a) + pi*x^2*log(abs(b))*sgn(a) + pi*x^2*log(abs
(a))*sgn(b) + pi*x^2*log(abs(b))*sgn(b) - 2*pi*x^2*log(abs(a)) - 2*pi*x^2*l
```

og(abs(b)) - pi*x*sgn(a) - pi*x*sgn(b) + 2*pi*x)*(3*pi^3*sgn(a)*sgn(b) - 4*pi^3*sgn(a) + 3*pi*log(abs(a))^2*sgn(a) + 6*pi*log(abs(a))*log(abs(b))*sgn(a) + 3*pi*log(abs(b))^2*sgn(a) - 4*pi^3*sgn(b) + 3*pi*log(abs(a))^2*sgn(b) + 6*pi*log(abs(a))*log(abs(b))*sgn(b) + 3*pi*log(abs(b))^2*sgn(b) + 5*pi^3 - 6*pi*log(abs(a))^2 - 12*pi*log(abs(a))*log(abs(b)) - 6*pi*log(abs(b))^2)/((3*pi^3*sgn(a)*sgn(b) - 4*pi^3*sgn(a) + 3*pi*log(abs(a))^2*sgn(a) + 6*pi*log(abs(a))*log(abs(b))*sgn(a) + 3*pi*log(abs(b))^2*sgn(a) - 4*pi^3*sgn(b) + 3*pi*log(abs(a))^2*sgn(b) + 6*pi*log(abs(a))*log(abs(b))*sgn(b) + 3*pi*log(abs(b))^2*sgn(b) + 5*pi^3 - 6*pi*log(abs(a))^2 - 12*pi*log(abs(a))*log(abs(b)) - 6*pi*log(abs(b))^2)^2 + (3*pi^2*log(abs(a))*sgn(a)*sgn(b) + 3*pi^2*log(abs(b))*sgn(a)*sgn(b) - 6*pi^2*log(abs(a))*sgn(a) - 6*pi^2*log(abs(b))*sgn(a) - 6*pi^2*log(abs(a))*sgn(b) - 6*pi^2*log(abs(b))*sgn(b) + 9*pi^2*log(abs(a)) - 2*log(abs(a))^3 + 9*pi^2*log(abs(b)) - 6*log(abs(a))^2*log(abs(b)) - 6*log(abs(a))*log(abs(b))^2 - 2*log(abs(b))^3)^2) + (pi^2*x^2*sgn(a)*sgn(b) - 2*pi^2*x^2*sgn(a) - 2*pi^2*x^2*sgn(b) + 3*pi^2*x^2 - 2*x^2*log(abs(a))^2 - 4*x^2*log(abs(a))*log(abs(b)) - 2*x^2*log(abs(b))^2 + 4*x*log(abs(a)) + 4*x*log(abs(b)) - 4)*(3*pi^2*log(abs(a))*sgn(a)*sgn(b) + 3*pi^2*log(abs(b))*sgn(a)*sgn(b) - 6*pi^2*log(abs(a))*sgn(a) - 6*pi^2*log(abs(b))*sgn(a) - 6*pi^2*log(abs(a))*sgn(b) - 6*pi^2*log(abs(b))*sgn(b) + 9*pi^2*log(abs(a)) - 2*log(abs(a))^3 + 9*pi^2*log(abs(b)) - 6*log(abs(a))^2*log(abs(b)) - 6*log(abs(a))*log(abs(b))^2 - 2*log(abs(b))^3)/((3*pi^3*sgn(a)*sgn(b) - 4*pi^3*sgn(a) + 3*pi*log(abs(a))^2*sgn(a) + 6*pi*log(abs(a))*log(abs(b))*sgn(a) + 3*pi*log(abs(b))^2*sgn(a) - 4*pi^3*sgn(b) + 3*pi*log(abs(a))^2*sgn(b) + 6*pi*log(abs(a))*log(abs(b))*sgn(b) + 3*pi*log(abs(b))^2*sgn(b) + 5*pi^3 - 6*pi*log(abs(a))^2 - 12*pi*log(abs(a))*log(abs(b)) - 6*pi*log(abs(b))^2)^2 + (3*pi^2*log(abs(a))*sgn(a)*sgn(b) + 3*pi^2*log(abs(b))*sgn(a)*sgn(b) - 6*pi^2*log(abs(a))*sgn(a) - 6*pi^2*log(abs(b))*sgn(a) - 6*pi^2*log(abs(a))*sgn(b) - 6*pi^2*log(abs(b))*sgn(b) + 9*pi^2*log(abs(a)) - 2*log(abs(a))^3 + 9*pi^2*log(abs(b)) - 6*log(abs(a))^2*log(abs(b)) - 6*log(abs(a))*log(abs(b))^2 - 2*log(abs(b))^3)^2))*cos(-1/2*pi*x*sgn(a) - 1/2*pi*x*sgn(b) + pi*x) + ((pi^2*x^2*sgn(a)*sgn(b) - 2*pi^2*x^2*sgn(a) - 2*pi^2*x^2*sgn(b) + 3*pi^2*x^2 - 2*x^2*log(abs(a))^2 - 4*x^2*log(abs(a))*log(abs(b)) - 2*x^2*log(abs(b))^2 + 4*x*log(abs(a)) + 4*x*log(abs(b)) - 4)*(3*pi^3*sgn(a)*sgn(b) - 4*pi^3*sgn(a) + 3*pi*log(abs(a))^2*sgn(a) + 6*pi*log(abs(a))*log(abs(b))*sgn(a) + 3*pi*log(abs(b))^2*sgn(a) - 4*pi^3*sgn(b) + 3*pi*log(abs(a))^2*sgn(b) + 6*pi*log(abs(a))*log(abs(b))*sgn(b) + 3*pi*log(abs(b))^2*sgn(b) + 5*pi^3 - 6*pi*log(abs(a))^2 - 12*pi*log(abs(a))*log(abs(b)) - 6*pi*log(abs(b))^2)/((3*pi^3*sgn(a)*sgn(b) - 4*pi^3*sgn(a) + 3*pi*log(abs(a))^2*sgn(a) + 6*pi*log(abs(a))*log(abs(b))*sgn(a) + 3*pi*log(abs(b))^2*sgn(a) - 4*pi^3*sgn(b) + 3*pi*log(abs(a))^2*sgn(b) + 6*pi*log(abs(a))*log(abs(b))*sgn(b) + 3*pi*log(abs(b))^2*sgn(b) + 5*pi^3 - 6*pi*log(abs(a))^2 - 12*pi*log(abs(a))*log(abs(b)) - 6*pi*log(abs(b))^2)^2 + (3*pi^2*log(abs(a))*sgn(a)*sgn(b) + 3*pi^2*log(abs(b))*sgn(a)*sgn(b) - 6*pi^2*log(abs(a))*sgn(a) - 6*pi^2*log(abs(b))*sgn(a) - 6*pi^2*log(abs(a))*sgn(b) - 6*pi^2*log(abs(b))*sgn(b) + 9*pi^2*log(abs(a)) - 2*log(abs(a))^3 + 9*pi^2*log(abs(b)) - 6*log(abs(a))^2*log(abs(b)) - 6

```
*log(abs(a))*log(abs(b))^2 - 2*log(abs(b))^3)^2) - 2*(pi*x^2*log(abs(a))*sg
n(a) + pi*x^2*log(abs(b))*sgn(a) + pi*x^2*log(abs(a))*sgn(b) + pi*x^2*log(a
bs(b))*sgn(b) - 2*pi*x^2*log(abs(a)) - 2*pi*x^2*log(abs(b)) - pi*x*sgn(a) -
 pi*x*sgn(b) + 2*pi*x)*(3*pi^2*log(abs(a))*sgn(a)*sgn(b) + 3*pi^2*log(abs(b
))*sgn(a)*sgn(b) - 6*pi^2*log(abs(a))*sgn(a) - 6*pi^2*log(abs(b))*sgn(a) -
6*pi^2*log(abs(a))*sgn(b) - 6*pi^2*log(abs(b))*sgn(b) + 9*pi^2*log(abs(a))
- 2*log(abs(a))^3 + 9*pi^2*log(abs(b)) - 6*log(abs(a))^2*log(abs(b)) - 6*lo
g(abs(a))*log(abs(b))^2 - 2*log(abs(b))^3)/((3*pi^3*sgn(a)*sgn(b) - 4*pi^3*
sgn(a) + 3*pi*log(abs(a))^2*sgn(a) + 6*pi*log(abs(a))*log(abs(b))*sgn(a) +
3*pi*log(abs(b))^2*sgn(a) - 4*pi^3*sgn(b) + 3*pi*log(abs(a))^2*sgn(b) + 6*p
i*log(abs(a))*log(abs(b))*sgn(b) + 3*pi*log(abs(b))^2*sgn(b) + 5*pi^3 - 6*p
i*log(abs(a))^2 - 12*pi*log(abs(a))*log(abs(b)) - 6*pi*log(abs(b))^2)^2 + (
3*pi^2*log(abs(a))*sgn(a)*sgn(b) + 3*pi^2*log(abs(b))*sgn(a)*sgn(b) - 6*pi^
2*log(abs(a))*sgn(a) - 6*pi^2*log(abs(b))*sgn(a) - 6*pi^2*log(abs(a))*sgn(b
) - 6*pi^2*log(abs(b))*sgn(b) + 9*pi^2*log(abs(a)) - 2*log(abs(a))^3 + 9*pi
^2*log(abs(b)) - 6*log(abs(a))^2*log(abs(b)) - 6*log(abs(a))*log(abs(b))^2
- 2*log(abs(b))^3)^2))*sin(-1/2*pi*x*sgn(a) - 1/2*pi*x*sgn(b) + pi*x))*e^(x
*(log(abs(a)) + log(abs(b)))) + 1/2*((pi^2*i*x^2*sgn(a)*sgn(b) - 2*pi^2*i*x
^2*sgn(a) - 2*pi^2*i*x^2*sgn(b) + 3*pi^2*i*x^2 - 2*i*x^2*log(abs(a))^2 - 4*
i*x^2*log(abs(a))*log(abs(b)) - 2*i*x^2*log(abs(b))^2 + 2*pi*x^2*log(abs(a)
)*sgn(a) + 2*pi*x^2*log(abs(b))*sgn(a) + 2*pi*x^2*log(abs(a))*sgn(b) + 2*pi
*x^2*log(abs(b))*sgn(b) - 4*pi*x^2*log(abs(a)) - 4*pi*x^2*log(abs(b)) + 4*i
*x*log(abs(a)) + 4*i*x*log(abs(b)) - 2*pi*x*sgn(a) - 2*pi*x*sgn(b) + 4*pi*x
 - 4*i)*e^(1/2*(pi*(sgn(a) - 1) + pi*(sgn(b) - 1))*i*x)/(3*pi^3*i*sgn(a)*sg
n(b) - 4*pi^3*i*sgn(a) + 3*pi*i*log(abs(a))^2*sgn(a) + 6*pi*i*log(abs(a))*l
og(abs(b))*sgn(a) + 3*pi*i*log(abs(b))^2*sgn(a) - 4*pi^3*i*sgn(b) + 3*pi*i*
log(abs(a))^2*sgn(b) + 6*pi*i*log(abs(a))*log(abs(b))*sgn(b) + 3*pi*i*log(a
bs(b))^2*sgn(b) - 3*pi^2*log(abs(a))*sgn(a)*sgn(b) - 3*pi^2*log(abs(b))*sgn
(a)*sgn(b) + 5*pi^3*i - 6*pi*i*log(abs(a))^2 - 12*pi*i*log(abs(a))*log(abs(
b)) - 6*pi*i*log(abs(b))^2 + 6*pi^2*log(abs(a))*sgn(a) + 6*pi^2*log(abs(b))
*sgn(a) + 6*pi^2*log(abs(a))*sgn(b) + 6*pi^2*log(abs(b))*sgn(b) - 9*pi^2*lo
g(abs(a)) + 2*log(abs(a))^3 - 9*pi^2*log(abs(b)) + 6*log(abs(a))^2*log(abs(
b)) + 6*log(abs(a))*log(abs(b))^2 + 2*log(abs(b))^3) + (pi^2*i*x^2*sgn(a)*s
gn(b) - 2*pi^2*i*x^2*sgn(a) - 2*pi^2*i*x^2*sgn(b) + 3*pi^2*i*x^2 - 2*i*x^2*
log(abs(a))^2 - 4*i*x^2*log(abs(a))*log(abs(b)) - 2*i*x^2*log(abs(b))^2 - 2
*pi*x^2*log(abs(a))*sgn(a) - 2*pi*x^2*log(abs(b))*sgn(a) - 2*pi*x^2*log(abs
(a))*sgn(b) - 2*pi*x^2*log(abs(b))*sgn(b) + 4*pi*x^2*log(abs(a)) + 4*pi*x^2
*log(abs(b)) + 4*i*x*log(abs(a)) + 4*i*x*log(abs(b)) + 2*pi*x*sgn(a) + 2*pi
*x*sgn(b) - 4*pi*x - 4*i)*e^(-1/2*(pi*(sgn(a) - 1) + pi*(sgn(b) - 1))*i*x)/
(3*pi^3*i*sgn(a)*sgn(b) - 4*pi^3*i*sgn(a) + 3*pi*i*log(abs(a))^2*sgn(a) + 6
*pi*i*log(abs(a))*log(abs(b))*sgn(a) + 3*pi*i*log(abs(b))^2*sgn(a) - 4*pi^3
*i*sgn(b) + 3*pi*i*log(abs(a))^2*sgn(b) + 6*pi*i*log(abs(a))*log(abs(b))*sg
n(b) + 3*pi*i*log(abs(b))^2*sgn(b) + 3*pi^2*log(abs(a))*sgn(a)*sgn(b) + 3*p
i^2*log(abs(b))*sgn(a)*sgn(b) + 5*pi^3*i - 6*pi*i*log(abs(a))^2 - 12*pi*i*l
og(abs(a))*log(abs(b)) - 6*pi*i*log(abs(b))^2 - 6*pi^2*log(abs(a))*sgn(a) -
```

```
 6*pi^2*log(abs(b))*sgn(a) - 6*pi^2*log(abs(a))*sgn(b) - 6*pi^2*log(abs(b))
*sgn(b) + 9*pi^2*log(abs(a)) - 2*log(abs(a))^3 + 9*pi^2*log(abs(b)) - 6*log
(abs(a))^2*log(abs(b)) - 6*log(abs(a))*log(abs(b))^2 - 2*log(abs(b))^3))*e^
(x*(log(abs(a)) + log(abs(b))))/i
```

maple [A] time = 0.01, size = 69, normalized size = 1.41

$$\frac{\left(x^2\ln(a)^2+2x^2\ln(a)\ln(b)+x^2\ln(b)^2-2x\ln(a)-2x\ln(b)+2\right)a^x b^x}{(\ln(a)+\ln(b))\left(\ln(a)^2+2\ln(a)\ln(b)+\ln(b)^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(a^x*b^x*x^2,x)
```

```
[Out] (ln(a)^2*x^2+2*ln(a)*ln(b)*x^2+ln(b)^2*x^2-2*ln(a)*x-2*ln(b)*x+2)*a^x*b^x/(
ln(a)+ln(b))/(ln(a)^2+2*ln(a)*ln(b)+ln(b)^2)
```

maxima [A] time = 0.92, size = 67, normalized size = 1.37

$$\frac{\left(\left(\log(a)^2+2\,\log(a)\log(b)+\log(b)^2\right)x^2-2\,x\left(\log(a)+\log(b)\right)+2\right)e^{\left(x\log(a)+x\log(b)\right)}}{\log(a)^3+3\,\log(a)^2\log(b)+3\,\log(a)\log(b)^2+\log(b)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x*b^x*x^2,x, algorithm="maxima")
```

```
[Out] ((log(a)^2 + 2*log(a)*log(b) + log(b)^2)*x^2 - 2*x*(log(a) + log(b)) + 2)*e
^(x*log(a) + x*log(b))/(log(a)^3 + 3*log(a)^2*log(b) + 3*log(a)*log(b)^2 +
log(b)^3)
```

mupad [B] time = 0.05, size = 35, normalized size = 0.71

$$\frac{a^x\,b^x\,\left(x^2\,{\left(\ln(a)+\ln(b)\right)}^2-2\,x\,\left(\ln(a)+\ln(b)\right)+2\right)}{{\left(\ln(a)+\ln(b)\right)}^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(a^x*b^x*x^2,x)
```

```
[Out] (a^x*b^x*(x^2*(log(a) + log(b))^2 - 2*x*(log(a) + log(b)) + 2))/(log(a) + l
og(b))^3
```

sympy [A] time = 2.29, size = 279, normalized size = 5.69

$$\begin{cases} \frac{a^x b^x x^2 \log(a)^2}{\log(a)^3+3\log(a)^2\log(b)+3\log(a)\log(b)^2+\log(b)^3} + \frac{2a^x b^x x^2 \log(a)\log(b)}{\log(a)^3+3\log(a)^2\log(b)+3\log(a)\log(b)^2+\log(b)^3} + \frac{a^x b^x x^2 \log(b)^2}{\log(a)^3+3\log(a)^2\log(b)+3\log(a} \\ \tilde{\infty} b^x \left(\frac{1}{b}\right)^x \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a**x*b**x*x**2,x)
```

```
[Out] Piecewise((a**x*b**x*x**2*log(a)**2/(log(a)**3 + 3*log(a)**2*log(b) + 3*log
(a)*log(b)**2 + log(b)**3) + 2*a**x*b**x*x**2*log(a)*log(b)/(log(a)**3 + 3*
log(a)**2*log(b) + 3*log(a)*log(b)**2 + log(b)**3) + a**x*b**x*x**2*log(b)*
*2/(log(a)**3 + 3*log(a)**2*log(b) + 3*log(a)*log(b)**2 + log(b)**3) - 2*a*
*x*b**x*x*log(a)/(log(a)**3 + 3*log(a)**2*log(b) + 3*log(a)*log(b)**2 + log
(b)**3) - 2*a**x*b**x*x*log(b)/(log(a)**3 + 3*log(a)**2*log(b) + 3*log(a)*l
og(b)**2 + log(b)**3) + 2*a**x*b**x/(log(a)**3 + 3*log(a)**2*log(b) + 3*log
(a)*log(b)**2 + log(b)**3), Ne(a, 1/b)), (zoo*b**x*(1/b)**x, True))
```

3.564 $\int a^x b^x x \, dx$

Optimal. Leaf size=31

$$\frac{x a^x b^x}{\log(a) + \log(b)} - \frac{a^x b^x}{(\log(a) + \log(b))^2}$$

```
[Out] -a^x*b^x/(ln(a)+ln(b))^2+a^x*b^x*x/(ln(a)+ln(b))
```

Rubi [A] time = 0.03, antiderivative size = 31, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375, Rules used = {2287, 2176, 2194}

$$\frac{x a^x b^x}{\log(a) + \log(b)} - \frac{a^x b^x}{(\log(a) + \log(b))^2}$$

Antiderivative was successfully verified.

```
[In] Int[a^x*b^x*x,x]
```

```
[Out] -((a^x*b^x)/(Log[a] + Log[b])^2) + (a^x*b^x*x)/(Log[a] + Log[b])
```

Rule 2176

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_.), x_Symbol] :> Simp[((c + d*x)^m*(b*F^(g*(e + f*x)))^n)/(f*g*n*Log[F]),
x] - Dist[(d*m)/(f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*(b*F^(g*(e + f*x)))^n
, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && GtQ[m, 0] && IntegerQ[2*m
] &&  !$UseGamma === True
```

Rule 2194

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 2287

```
Int[(u_.)*(F_)^(v_)*(G_)^(w_), x_Symbol] :> With[{z = v*Log[F] + w*Log[G]},
 Int[u*NormalizeIntegrand[E^z, x], x] /; BinomialQ[z, x] || (PolynomialQ[z,
 x] && LeQ[Exponent[z, x], 2])] /; FreeQ[{F, G}, x]
```

Rubi steps

$$\int a^x b^x x\,dx = \int e^{x(\log(a)+\log(b))} x\,dx$$
$$= \frac{a^x b^x x}{\log(a)+\log(b)} - \frac{\int e^{x(\log(a)+\log(b))}\,dx}{\log(a)+\log(b)}$$
$$= -\frac{a^x b^x}{(\log(a)+\log(b))^2} + \frac{a^x b^x x}{\log(a)+\log(b)}$$

Mathematica [A] time = 0.02, size = 26, normalized size = 0.84

$$a^x b^x \left(\frac{x}{\log(a)+\log(b)} - \frac{1}{(\log(a)+\log(b))^2}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[a^x*b^x*x,x]
[Out] a^x*b^x*(-(Log[a] + Log[b])^(-2) + x/(Log[a] + Log[b]))
```

fricas [A] time = 0.40, size = 34, normalized size = 1.10

$$\frac{(x\log(a) + x\log(b) - 1)a^x b^x}{\log(a)^2 + 2\,\log(a)\log(b) + \log(b)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x*b^x*x,x, algorithm="fricas")
[Out] (x*log(a) + x*log(b) - 1)*a^x*b^x/(log(a)^2 + 2*log(a)*log(b) + log(b)^2)
```

giac [B] time = 0.29, size = 1020, normalized size = 32.90

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x*b^x*x,x, algorithm="giac")
[Out] (2*((pi*x*sgn(a) + pi*x*sgn(b) - 2*pi*x)*(pi*log(abs(a))*sgn(a) + pi*log(ab
s(b))*sgn(a) + pi*log(abs(a))*sgn(b) + pi*log(abs(b))*sgn(b) - 2*pi*log(abs
(a)) - 2*pi*log(abs(b)))/((pi^2*sgn(a)*sgn(b) - 2*pi^2*sgn(a) - 2*pi^2*sgn(
b) + 3*pi^2 - 2*log(abs(a))^2 - 4*log(abs(a))*log(abs(b)) - 2*log(abs(b))^2
)^2 + 4*(pi*log(abs(a))*sgn(a) + pi*log(abs(b))*sgn(a) + pi*log(abs(a))*sgn
(b) + pi*log(abs(b))*sgn(b) - 2*pi*log(abs(a)) - 2*pi*log(abs(b)))^2) - (pi
```

```
^2*sgn(a)*sgn(b) - 2*pi^2*sgn(a) - 2*pi^2*sgn(b) + 3*pi^2 - 2*log(abs(a))^2
 - 4*log(abs(a))*log(abs(b)) - 2*log(abs(b))^2)*(x*log(abs(a)) + x*log(abs(
b)) - 1)/((pi^2*sgn(a)*sgn(b) - 2*pi^2*sgn(a) - 2*pi^2*sgn(b) + 3*pi^2 - 2*
log(abs(a))^2 - 4*log(abs(a))*log(abs(b)) - 2*log(abs(b))^2)^2 + 4*(pi*log(
abs(a))*sgn(a) + pi*log(abs(b))*sgn(a) + pi*log(abs(a))*sgn(b) + pi*log(abs
(b))*sgn(b) - 2*pi*log(abs(a)) - 2*pi*log(abs(b)))^2))*cos(-1/2*pi*x*sgn(a)
 - 1/2*pi*x*sgn(b) + pi*x) - ((pi^2*sgn(a)*sgn(b) - 2*pi^2*sgn(a) - 2*pi^2*
sgn(b) + 3*pi^2 - 2*log(abs(a))^2 - 4*log(abs(a))*log(abs(b)) - 2*log(abs(b
))^2)*(pi*x*sgn(a) + pi*x*sgn(b) - 2*pi*x)/((pi^2*sgn(a)*sgn(b) - 2*pi^2*sg
n(a) - 2*pi^2*sgn(b) + 3*pi^2 - 2*log(abs(a))^2 - 4*log(abs(a))*log(abs(b))
 - 2*log(abs(b))^2)^2 + 4*(pi*log(abs(a))*sgn(a) + pi*log(abs(b))*sgn(a) +
pi*log(abs(a))*sgn(b) + pi*log(abs(b))*sgn(b) - 2*pi*log(abs(a)) - 2*pi*log
(abs(b)))^2) + 4*(pi*log(abs(a))*sgn(a) + pi*log(abs(b))*sgn(a) + pi*log(ab
s(a))*sgn(b) + pi*log(abs(b))*sgn(b) - 2*pi*log(abs(a)) - 2*pi*log(abs(b)))
*(x*log(abs(a)) + x*log(abs(b)) - 1)/((pi^2*sgn(a)*sgn(b) - 2*pi^2*sgn(a) -
 2*pi^2*sgn(b) + 3*pi^2 - 2*log(abs(a))^2 - 4*log(abs(a))*log(abs(b)) - 2*l
og(abs(b))^2)^2 + 4*(pi*log(abs(a))*sgn(a) + pi*log(abs(b))*sgn(a) + pi*log
(abs(a))*sgn(b) + pi*log(abs(b))*sgn(b) - 2*pi*log(abs(a)) - 2*pi*log(abs(b
)))^2))*sin(-1/2*pi*x*sgn(a) - 1/2*pi*x*sgn(b) + pi*x))*e^(x*(log(abs(a)) +
 log(abs(b)))) - 1/2*((2*i*x*log(abs(a)) + 2*i*x*log(abs(b)) - pi*x*sgn(a)
- pi*x*sgn(b) + 2*pi*x - 2*i)*e^(1/2*(pi*(sgn(a) - 1) + pi*(sgn(b) - 1))*i*
x)/(2*pi*i*log(abs(a))*sgn(a) + 2*pi*i*log(abs(b))*sgn(a) + 2*pi*i*log(abs(
a))*sgn(b) + 2*pi*i*log(abs(b))*sgn(b) - pi^2*sgn(a)*sgn(b) - 4*pi*i*log(ab
s(a)) - 4*pi*i*log(abs(b)) + 2*pi^2*sgn(a) + 2*pi^2*sgn(b) - 3*pi^2 + 2*log
(abs(a))^2 + 4*log(abs(a))*log(abs(b)) + 2*log(abs(b))^2) + (2*i*x*log(abs(
a)) + 2*i*x*log(abs(b)) + pi*x*sgn(a) + pi*x*sgn(b) - 2*pi*x - 2*i)*e^(-1/2
*(pi*(sgn(a) - 1) + pi*(sgn(b) - 1))*i*x)/(2*pi*i*log(abs(a))*sgn(a) + 2*pi
*i*log(abs(b))*sgn(a) + 2*pi*i*log(abs(a))*sgn(b) + 2*pi*i*log(abs(b))*sgn(
b) + pi^2*sgn(a)*sgn(b) - 4*pi*i*log(abs(a)) - 4*pi*i*log(abs(b)) - 2*pi^2*
sgn(a) - 2*pi^2*sgn(b) + 3*pi^2 - 2*log(abs(a))^2 - 4*log(abs(a))*log(abs(b
)) - 2*log(abs(b))^2))*e^(x*(log(abs(a)) + log(abs(b))))/i
```

maple [A] time = 0.01, size = 25, normalized size = 0.81

$$\frac{(x\ln(a)+x\ln(b)-1)\,a^{x}b^{x}}{(\ln(a)+\ln(b))^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(a^x*b^x*x,x)
```

```
[Out] (x*ln(b)+x*ln(a)-1)*a^x*b^x/(ln(a)+ln(b))^2
```

maxima [A] time = 0.79, size = 37, normalized size = 1.19

$$\frac{\left(x\left(\log(a)+\log(b)\right)-1\right)e^{\left(x\log(a)+x\log(b)\right)}}{\log(a)^{2}+2\,\log(a)\log(b)+\log(b)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x*b^x*x,x, algorithm="maxima")
```

```
[Out] (x*(log(a) + log(b)) - 1)*e^(x*log(a) + x*log(b))/(log(a)^2 + 2*log(a)*log(
b) + log(b)^2)
```

mupad [B] time = 0.02, size = 23, normalized size = 0.74

$$\frac{a^x\,b^x\,\left(x\,\left(\ln(a)+\ln(b)\right)-1\right)}{{\left(\ln(a)+\ln(b)\right)}^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(a^x*b^x*x,x)
```

```
[Out] (a^x*b^x*(x*(log(a) + log(b)) - 1))/(log(a) + log(b))^2
```

sympy [A] time = 1.15, size = 97, normalized size = 3.13

$$\begin{cases} \frac{a^{x} b^{x} x \log{\left(a \right)}}{\log{\left(a \right)}^{2} + 2 \log{\left(a \right)} \log{\left(b \right)} + \log{\left(b \right)}^{2}} + \frac{a^{x} b^{x} x \log{\left(b \right)}}{\log{\left(a \right)}^{2} + 2 \log{\left(a \right)} \log{\left(b \right)} + \log{\left(b \right)}^{2}} - \frac{a^{x} b^{x}}{\log{\left(a \right)}^{2} + 2 \log{\left(a \right)} \log{\left(b \right)} + \log{\left(b \right)}^{2}} & \text{for}\: a \neq \frac{1}{b} \\\tilde{\infty} b^{x} \left(\frac{1}{b}\right)^{x} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a**x*b**x*x,x)
```

```
[Out] Piecewise((a**x*b**x*x*log(a)/(log(a)**2 + 2*log(a)*log(b) + log(b)**2) + a
**x*b**x*x*log(b)/(log(a)**2 + 2*log(a)*log(b) + log(b)**2) - a**x*b**x/(lo
g(a)**2 + 2*log(a)*log(b) + log(b)**2), Ne(a, 1/b)), (zoo*b**x*(1/b)**x, Tr
ue))
```

3.565 $\int a^x b^x \, dx$

Optimal. Leaf size=14

$$\frac{a^x b^x}{\log(a) + \log(b)}$$

```
[Out] a^x*b^x/(ln(a)+ln(b))
```

Rubi [A] time = 0.01, antiderivative size = 14, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {2287, 2194}

$$\frac{a^x b^x}{\log(a) + \log(b)}$$

Antiderivative was successfully verified.

```
[In] Int[a^x*b^x,x]
```

```
[Out] (a^x*b^x)/(Log[a] + Log[b])
```

Rule 2194

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 2287

```
Int[(u_.)*(F_)^(v_)*(G_)^(w_), x_Symbol] :> With[{z = v*Log[F] + w*Log[G]},
 Int[u*NormalizeIntegrand[E^z, x], x] /; BinomialQ[z, x] || (PolynomialQ[z,
 x] && LeQ[Exponent[z, x], 2])] /; FreeQ[{F, G}, x]
```

Rubi steps

$$\begin{aligned} \int a^x b^x \, dx &= \int e^{x(\log(a)+\log(b))} \, dx \\ &= \frac{a^x b^x}{\log(a) + \log(b)} \end{aligned}$$

Mathematica [A] time = 0.01, size = 14, normalized size = 1.00

$$\frac{a^x b^x}{\log(a) + \log(b)}$$

Antiderivative was successfully verified.

```
[In] Integrate[a^x*b^x,x]
```

```
[Out] (a^x*b^x)/(Log[a] + Log[b])
```

fricas [A] time = 0.40, size = 14, normalized size = 1.00

$$\frac{a^x b^x}{\log(a) + \log(b)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x*b^x,x, algorithm="fricas")
```

```
[Out] a^x*b^x/(log(a) + log(b))
```

giac [B] time = 0.25, size = 242, normalized size = 17.29

$$2\left(\frac{2\left(\log\left(|a|\right) + \log\left(|b|\right)\right)\cos\left(-\frac{1}{2}\pi x\mathrm{sgn}(a) - \frac{1}{2}\pi x\mathrm{sgn}(b) + \pi x\right)}{\left(2\pi - \pi\mathrm{sgn}(a) - \pi\mathrm{sgn}(b)\right)^2 + 4\left(\log\left(|a|\right) + \log\left(|b|\right)\right)^2} + \frac{\left(2\pi - \pi\mathrm{sgn}(a) - \pi\mathrm{sgn}(b)\right)\sin\left(-\frac{1}{2}\pi x\mathrm{sgn}(a\right.}{\left(2\pi - \pi\mathrm{sgn}(a) - \pi\mathrm{sgn}(b)\right)^2 + 4\left(\log\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x*b^x,x, algorithm="giac")
```

```
[Out] 2*(2*(log(abs(a)) + log(abs(b)))*cos(-1/2*pi*x*sgn(a) - 1/2*pi*x*sgn(b) + p
i*x)/((2*pi - pi*sgn(a) - pi*sgn(b))^2 + 4*(log(abs(a)) + log(abs(b)))^2) +
 (2*pi - pi*sgn(a) - pi*sgn(b))*sin(-1/2*pi*x*sgn(a) - 1/2*pi*x*sgn(b) + pi
*x)/((2*pi - pi*sgn(a) - pi*sgn(b))^2 + 4*(log(abs(a)) + log(abs(b)))^2))*e
^(x*(log(abs(a)) + log(abs(b)))) - (i*e^(1/2*(pi*(sgn(a) - 1) + pi*(sgn(b)
- 1))*i*x)/(pi*i*sgn(a) + pi*i*sgn(b) - 2*pi*i + 2*log(abs(a)) + 2*log(abs(
b))) + i*e^(-1/2*(pi*(sgn(a) - 1) + pi*(sgn(b) - 1))*i*x)/(pi*i*sgn(a) + pi
*i*sgn(b) - 2*pi*i - 2*log(abs(a)) - 2*log(abs(b))))*e^(x*(log(abs(a)) + lo
g(abs(b))))/i
```

maple [A] time = 0.00, size = 15, normalized size = 1.07

$$\frac{a^x b^x}{\ln(a) + \ln(b)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(a^x*b^x,x)
```

```
[Out] a^x*b^x/(ln(a)+ln(b))
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x*b^x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(log(b)/log(a)>0)', see `assume?` fo
r more details)Is log(b)/log(a) equal to -1?
```

mupad [B] time = 3.60, size = 14, normalized size = 1.00

$$\frac{a^x\,b^x}{\ln(a)+\ln(b)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(a^x*b^x,x)
```

```
[Out] (a^x*b^x)/(log(a) + log(b))
```

sympy [A] time = 0.57, size = 24, normalized size = 1.71

$$\begin{cases} \frac{a^x b^x}{\log{(a)}+\log{(b)}} & \text{for}\ a \neq \frac{1}{b} \\ \tilde{\infty} b^x \left(\frac{1}{b}\right)^x & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a**x*b**x,x)
```

```
[Out] Piecewise((a**x*b**x/(log(a) + log(b)), Ne(a, 1/b)), (zoo*b**x*(1/b)**x, Tr
ue))
```

3.566 $\int \frac{a^x b^x}{x}\,dx$

Optimal. Leaf size=8

$$\text{Ei}(x(\log(a)+\log(b)))$$

```
[Out] Ei(x*(ln(a)+ln(b)))
```

Rubi [A] time = 0.04, antiderivative size = 8, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2287, 2178}

$$\text{Ei}(x(\log(a)+\log(b)))$$

Antiderivative was successfully verified.

```
[In] Int[(a^x*b^x)/x,x]
```

```
[Out] ExpIntegralEi[x*(Log[a] + Log[b])]
```

Rule 2178

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - (c*f)/d))*ExpIntegralEi[(f*g*(c + d*x)*Log[F])/d])/d, x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2287

```
Int[(u_.)*(F_)^(v_)*(G_)^(w_), x_Symbol] :> With[{z = v*Log[F] + w*Log[G]},
 Int[u*NormalizeIntegrand[E^z, x], x] /; BinomialQ[z, x] || (PolynomialQ[z,
 x] && LeQ[Exponent[z, x], 2])] /; FreeQ[{F, G}, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{a^x b^x}{x}\,dx &= \int \frac{e^{x(\log(a)+\log(b))}}{x}\,dx\\
&= \text{Ei}(x(\log(a)+\log(b)))
\end{aligned}$$

Mathematica [A] time = 0.01, size = 10, normalized size = 1.25

$$\text{Ei}(x\log(a)+x\log(b))$$

Antiderivative was successfully verified.

```
[In] Integrate[(a^x*b^x)/x,x]
```

```
[Out] ExpIntegralEi[x*Log[a] + x*Log[b]]
```

fricas [A] time = 0.40, size = 10, normalized size = 1.25

$$\mathrm{Ei}\left(x\log(a) + x\log(b)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x*b^x/x,x, algorithm="fricas")
```

```
[Out] Ei(x*log(a) + x*log(b))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a^x b^x}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x*b^x/x,x, algorithm="giac")
```

```
[Out] integrate(a^x*b^x/x, x)
```

maple [C] time = 0.06, size = 56, normalized size = 7.00

$$-\mathrm{Ei}\left(1, -\left(\frac{\ln(a)}{\ln(b)}+1\right)x\ln(b)\right)+\ln(x)-\ln\left(-\left(\frac{\ln(a)}{\ln(b)}+1\right)x\ln(b)\right)+\ln\left(\frac{\ln(a)}{\ln(b)}+1\right)+\ln\left(\ln(b)\right)+i\pi$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(a^x*b^x/x,x)
```

```
[Out] -ln(-x*ln(b)*(1+ln(a)/ln(b)))-Ei(1,-x*ln(b)*(1+ln(a)/ln(b)))+ln(x)+I*Pi+ln(
ln(b))+ln(1+ln(a)/ln(b))
```

maxima [A] time = 1.34, size = 8, normalized size = 1.00

$$\mathrm{Ei}\left(x\left(\log(a) + \log(b)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x*b^x/x,x, algorithm="maxima")
```

```
[Out] Ei(x*(log(a) + log(b)))
```

mupad [B] time = 0.03, size = 8, normalized size = 1.00

$$\mathrm{ei}\left(x\ \left(\ln(a)+\ln(b)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^x*b^x)/x,x)
```

```
[Out] ei(x*(log(a) + log(b)))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a^x b^x}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a**x*b**x/x,x)
```

```
[Out] Integral(a**x*b**x/x, x)
```

3.567 $\int \frac{a^x b^x}{x^2} dx$

Optimal. Leaf size=26

$$(\log(a) + \log(b))\text{Ei}(x(\log(a) + \log(b))) - \frac{a^x b^x}{x}$$

```
[Out] -a^x*b^x/x+Ei(x*(ln(a)+ln(b)))*(ln(a)+ln(b))
```

Rubi [A] time = 0.06, antiderivative size = 26, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.300, Rules used = {2287, 2177, 2178}

$$(\log(a) + \log(b))\text{Ei}(x(\log(a) + \log(b))) - \frac{a^x b^x}{x}$$

Antiderivative was successfully verified.

```
[In] Int[(a^x*b^x)/x^2,x]
```

```
[Out] -((a^x*b^x)/x) + ExpIntegralEi[x*(Log[a] + Log[b])]*(Log[a] + Log[b])
```

Rule 2177

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_), x_Symbol] :> Simp[((c + d*x)^(m + 1)*(b*F^(g*(e + f*x)))^n)/(d*(m + 1))
, x] - Dist[(f*g*n*Log[F])/(d*(m + 1)), Int[(c + d*x)^(m + 1)*(b*F^(g*(e +
f*x)))^n, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && LtQ[m, -1] && Int
egerQ[2*m] &&  !$UseGamma === True
```

Rule 2178

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - (c*f)/d))*ExpIntegralEi[(f*g*(c + d*x)*Log[F])/d])/d, x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2287

```
Int[(u_.)*(F_)^(v_)*(G_)^(w_), x_Symbol] :> With[{z = v*Log[F] + w*Log[G]},
 Int[u*NormalizeIntegrand[E^z, x], x] /; BinomialQ[z, x] || (PolynomialQ[z,
 x] && LeQ[Exponent[z, x], 2])] /; FreeQ[{F, G}, x]
```

Rubi steps

$$\int \frac{a^x b^x}{x^2}\,dx = \int \frac{e^{x(\log(a)+\log(b))}}{x^2}\,dx$$
$$= -\frac{a^x b^x}{x} - (-\log(a)-\log(b))\int \frac{e^{x(\log(a)+\log(b))}}{x}\,dx$$
$$= -\frac{a^x b^x}{x} + \mathrm{Ei}(x(\log(a)+\log(b)))(\log(a)+\log(b))$$

Mathematica [F] time = 0.05, size = 0, normalized size = 0.00

$$\int \frac{a^x b^x}{x^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a^x*b^x)/x^2,x]
[Out] Integrate[(a^x*b^x)/x^2, x]
```

fricas [A] time = 0.40, size = 34, normalized size = 1.31

$$-\frac{a^x b^x - \left(x\log(a)+x\log(b)\right)\mathrm{Ei}\left(x\log(a)+x\log(b)\right)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x*b^x/x^2,x, algorithm="fricas")
[Out] -(a^x*b^x - (x*log(a) + x*log(b))*Ei(x*log(a) + x*log(b)))/x
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a^x b^x}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x*b^x/x^2,x, algorithm="giac")
[Out] integrate(a^x*b^x/x^2, x)
```

maple [C] time = 0.07, size = 160, normalized size = 6.15

$$-\left(\frac{\ln(a)}{\ln(b)}+1\right)\left(\mathrm{Ei}\left(1,-\left(\frac{\ln(a)}{\ln(b)}+1\right)x\ln(b)\right)-\ln(x)+\ln\left(-\left(\frac{\ln(a)}{\ln(b)}+1\right)x\ln(b)\right)-\ln\left(\frac{\ln(a)}{\ln(b)}+1\right)-\ln\left(\ln(b)\right)+\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(a^x*b^x/x^2,x)
```

```
[Out] -ln(b)*(ln(a)/ln(b)+1)*(-1/2/(ln(a)/ln(b)+1)/x/ln(b)*(2+2*(ln(a)/ln(b)+1)*x
*ln(b))+1/(ln(a)/ln(b)+1)/x/ln(b)*exp((ln(a)/ln(b)+1)*x*ln(b))+ln(-(ln(a)/l
n(b)+1)*x*ln(b))+Ei(1,-(ln(a)/ln(b)+1)*x*ln(b))+1-ln(x)-I*Pi-ln(ln(b))-ln(l
n(a)/ln(b)+1)+1/x/ln(b)/(ln(a)/ln(b)+1))
```

maxima [A] time = 1.30, size = 16, normalized size = 0.62

$$\left(\log(a) + \log(b)\right)\Gamma\left(-1, -x\left(\log(a) + \log(b)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x*b^x/x^2,x, algorithm="maxima")
```

```
[Out] (log(a) + log(b))*gamma(-1, -x*(log(a) + log(b)))
```

mupad [B] time = 3.50, size = 28, normalized size = 1.08

$$-\mathrm{expint}\left(-x\ \left(\ln(a) + \ln(b)\right)\right)\ \left(\ln(a) + \ln(b)\right) - \frac{a^x\, b^x}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^x*b^x)/x^2,x)
```

```
[Out] - expint(-x*(log(a) + log(b)))*(log(a) + log(b)) - (a^x*b^x)/x
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a^x b^x}{x^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a**x*b**x/x**2,x)
```

```
[Out] Integral(a**x*b**x/x**2, x)
```

3.568 $\int \frac{a^x b^x}{x^3}\,dx$

Optimal. Leaf size=51

$$-\frac{a^x b^x}{2x^2}-\frac{a^x b^x(\log(a)+\log(b))}{2x}+\frac{1}{2}(\log(a)+\log(b))^2\text{Ei}(x(\log(a)+\log(b)))$$

```
[Out] -1/2*a^x*b^x/x^2-1/2*a^x*b^x*(ln(a)+ln(b))/x+1/2*Ei(x*(ln(a)+ln(b)))*(ln(a)
+ln(b))^2
```

Rubi [A] time = 0.09, antiderivative size = 51, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.300, Rules used = {2287, 2177, 2178}

$$-\frac{a^x b^x}{2x^2}-\frac{a^x b^x(\log(a)+\log(b))}{2x}+\frac{1}{2}(\log(a)+\log(b))^2\text{Ei}(x(\log(a)+\log(b)))$$

Antiderivative was successfully verified.

```
[In] Int[(a^x*b^x)/x^3,x]
```

```
[Out] -(a^x*b^x)/(2*x^2) - (a^x*b^x*(Log[a] + Log[b]))/(2*x) + (ExpIntegralEi[x*(
Log[a] + Log[b])]*(Log[a] + Log[b])^2)/2
```

Rule 2177

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_), x_Symbol] :> Simp[((c + d*x)^(m + 1)*(b*F^(g*(e + f*x)))^n)/(d*(m + 1))
, x] - Dist[(f*g*n*Log[F])/(d*(m + 1)), Int[(c + d*x)^(m + 1)*(b*F^(g*(e +
f*x)))^n, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && LtQ[m, -1] && Int
egerQ[2*m] &&  !$UseGamma === True
```

Rule 2178

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - (c*f)/d))*ExpIntegralEi[(f*g*(c + d*x)*Log[F])/d])/d, x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2287

```
Int[(u_.)*(F_)^(v_)*(G_)^(w_), x_Symbol] :> With[{z = v*Log[F] + w*Log[G]},
 Int[u*NormalizeIntegrand[E^z, x], x] /; BinomialQ[z, x] || (PolynomialQ[z,
 x] && LeQ[Exponent[z, x], 2])] /; FreeQ[{F, G}, x]
```

Rubi steps

$$\int \frac{a^x b^x}{x^3}\,dx = \int \frac{e^{x(\log(a)+\log(b))}}{x^3}\,dx$$
$$= -\frac{a^x b^x}{2x^2} - \frac{1}{2}(-\log(a)-\log(b))\int \frac{e^{x(\log(a)+\log(b))}}{x^2}\,dx$$
$$= -\frac{a^x b^x}{2x^2} - \frac{a^x b^x(\log(a)+\log(b))}{2x} + \frac{1}{2}(\log(a)+\log(b))^2\int \frac{e^{x(\log(a)+\log(b))}}{x}\,dx$$
$$= -\frac{a^x b^x}{2x^2} - \frac{a^x b^x(\log(a)+\log(b))}{2x} + \frac{1}{2}\text{Ei}(x(\log(a)+\log(b)))(\log(a)+\log(b))^2$$

Mathematica [F] time = 0.06, size = 0, normalized size = 0.00

$$\int \frac{a^x b^x}{x^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a^x*b^x)/x^3,x]
[Out] Integrate[(a^x*b^x)/x^3, x]
```

fricas [A] time = 0.42, size = 61, normalized size = 1.20

$$-\frac{\left(x\log(a)+x\log(b)+1\right)a^x b^x - \left(x^2\log(a)^2 + 2\,x^2\log(a)\log(b) + x^2\log(b)^2\right)\text{Ei}\left(x\log(a)+x\log(b)\right)}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x*b^x/x^3,x, algorithm="fricas")
[Out] -1/2*((x*log(a) + x*log(b) + 1)*a^x*b^x - (x^2*log(a)^2 + 2*x^2*log(a)*log(
b) + x^2*log(b)^2)*Ei(x*log(a) + x*log(b)))/x^2
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a^x b^x}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x*b^x/x^3,x, algorithm="giac")
[Out] integrate(a^x*b^x/x^3, x)
```

maple [C] time = 0.07, size = 225, normalized size = 4.41

$$\left(\frac{\ln(a)}{\ln(b)}+1\right)^2\left(-\frac{\mathrm{Ei}\left(1,-\left(\frac{\ln(a)}{\ln(b)}+1\right)x\ln(b)\right)}{2}+\frac{\ln(x)}{2}-\frac{\ln\left(-\left(\frac{\ln(a)}{\ln(b)}+1\right)x\ln(b)\right)}{2}+\frac{\ln\left(\frac{\ln(a)}{\ln(b)}+1\right)}{2}+\frac{\ln(\ln(b))}{2}-\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(a^x*b^x/x^3,x)
```

```
[Out] ln(b)^2*(ln(a)/ln(b)+1)^2*(1/12/(ln(a)/ln(b)+1)^2/x^2/ln(b)^2*(9*(ln(a)/ln(
b)+1)^2*x^2*ln(b)^2+12*(ln(a)/ln(b)+1)*x*ln(b)+6)-1/6/(ln(a)/ln(b)+1)^2/x^2
/ln(b)^2*(3+3*(ln(a)/ln(b)+1)*x*ln(b))*exp((ln(a)/ln(b)+1)*x*ln(b))-1/2*ln(
-(ln(a)/ln(b)+1)*x*ln(b))-1/2*Ei(1,-(ln(a)/ln(b)+1)*x*ln(b))-3/4+1/2*ln(x)+
1/2*I*Pi+1/2*ln(ln(b))+1/2*ln(ln(a)/ln(b)+1)-1/2/x^2/ln(b)^2/(ln(a)/ln(b)+1
)^2-1/(ln(a)/ln(b)+1)/x/ln(b))
```

maxima [A] time = 1.33, size = 19, normalized size = 0.37

$$-\left(\log(a)+\log(b)\right)^2\Gamma\left(-2,-x\left(\log(a)+\log(b)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x*b^x/x^3,x, algorithm="maxima")
```

```
[Out] -(log(a) + log(b))^2*gamma(-2, -x*(log(a) + log(b)))
```

mupad [B] time = 0.05, size = 59, normalized size = 1.16

$$-\frac{\mathrm{expint}\left(-x\,\left(\ln(a)+\ln(b)\right)\right)\,\left(\ln(a)+\ln(b)\right)^2}{2}-a^x\,b^x\,\left(\frac{1}{2\,x\,\left(\ln(a)+\ln(b)\right)}+\frac{1}{2\,x^2\,\left(\ln(a)+\ln(b)\right)^2}\right)\,\left(\ln(a)+\ln(b)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^x*b^x)/x^3,x)
```

```
[Out] - (expint(-x*(log(a) + log(b)))*(log(a) + log(b))^2)/2 - a^x*b^x*(1/(2*x*(l
og(a) + log(b))) + 1/(2*x^2*(log(a) + log(b))^2))*(log(a) + log(b))^2
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{a^xb^x}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a**x*b**x/x**3,x)
```

```
[Out] Integral(a**x*b**x/x**3, x)
```

3.569 $\int a^x b^x c^x \, dx$

Optimal. Leaf size=19

$$\frac{a^x b^x c^x}{\log(a) + \log(b) + \log(c)}$$

```
[Out] a^x*b^x*c^x/(ln(a)+ln(b)+ln(c))
```

Rubi [A] time = 0.04, antiderivative size = 19, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2287, 2194}

$$\frac{a^x b^x c^x}{\log(a) + \log(b) + \log(c)}$$

Antiderivative was successfully verified.

```
[In] Int[a^x*b^x*c^x,x]
```

```
[Out] (a^x*b^x*c^x)/(Log[a] + Log[b] + Log[c])
```

Rule 2194

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 2287

```
Int[(u_.)*(F_)^(v_)*(G_)^(w_), x_Symbol] :> With[{z = v*Log[F] + w*Log[G]},
 Int[u*NormalizeIntegrand[E^z, x], x] /; BinomialQ[z, x] || (PolynomialQ[z,
 x] && LeQ[Exponent[z, x], 2])] /; FreeQ[{F, G}, x]
```

Rubi steps

$$\begin{aligned}
\int a^x b^x c^x \, dx &= \int c^x e^{x(\log(a)+\log(b))} \, dx \\
&= \int e^{x(\log(a)+\log(b)+\log(c))} \, dx \\
&= \frac{a^x b^x c^x}{\log(a) + \log(b) + \log(c)}
\end{aligned}$$

Mathematica [A] time = 0.02, size = 21, normalized size = 1.11

$$\frac{e^{x(\log(a)+\log(b)+\log(c))}}{\log(a) + \log(b) + \log(c)}$$

Antiderivative was successfully verified.

```
[In] Integrate[a^x*b^x*c^x,x]
```

```
[Out] E^(x*(Log[a] + Log[b] + Log[c]))/(Log[a] + Log[b] + Log[c])
```

fricas [A] time = 0.41, size = 19, normalized size = 1.00

$$\frac{a^x b^x c^x}{\log(a) + \log(b) + \log(c)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x*b^x*c^x,x, algorithm="fricas")
```

```
[Out] a^x*b^x*c^x/(log(a) + log(b) + log(c))
```

giac [B] time = 0.28, size = 318, normalized size = 16.74

$$2\left(\frac{2\left(\log(|a|) + \log(|b|) + \log(|c|)\right)\cos\left(-\frac{1}{2}\pi x\mathrm{sgn}(a) - \frac{1}{2}\pi x\mathrm{sgn}(b) - \frac{1}{2}\pi x\mathrm{sgn}(c) + \frac{3}{2}\pi x\right)}{\left(3\pi - \pi\mathrm{sgn}(a) - \pi\mathrm{sgn}(b) - \pi\mathrm{sgn}(c)\right)^2 + 4\left(\log(|a|) + \log(|b|) + \log(|c|)\right)^2} + \frac{\left(3\pi - \pi\mathrm{sgn}(a) - \right.}{\left(3\pi - \pi s\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x*b^x*c^x,x, algorithm="giac")
```

```
[Out] 2*(2*(log(abs(a)) + log(abs(b)) + log(abs(c)))*cos(-1/2*pi*x*sgn(a) - 1/2*p
i*x*sgn(b) - 1/2*pi*x*sgn(c) + 3/2*pi*x)/((3*pi - pi*sgn(a) - pi*sgn(b) - p
i*sgn(c))^2 + 4*(log(abs(a)) + log(abs(b)) + log(abs(c)))^2) + (3*pi - pi*s
gn(a) - pi*sgn(b) - pi*sgn(c))*sin(-1/2*pi*x*sgn(a) - 1/2*pi*x*sgn(b) - 1/2
*pi*x*sgn(c) + 3/2*pi*x)/((3*pi - pi*sgn(a) - pi*sgn(b) - pi*sgn(c))^2 + 4*
(log(abs(a)) + log(abs(b)) + log(abs(c)))^2))*e^(x*(log(abs(a)) + log(abs(b
)) + log(abs(c)))) - (i*e^(1/2*(pi*(sgn(a) - 1) + pi*(sgn(b) - 1) + pi*(sgn
(c) - 1))*i*x)/(pi*i*sgn(a) + pi*i*sgn(b) + pi*i*sgn(c) - 3*pi*i + 2*log(ab
s(a)) + 2*log(abs(b)) + 2*log(abs(c))) + i*e^(-1/2*(pi*(sgn(a) - 1) + pi*(s
gn(b) - 1) + pi*(sgn(c) - 1))*i*x)/(pi*i*sgn(a) + pi*i*sgn(b) + pi*i*sgn(c)
 - 3*pi*i - 2*log(abs(a)) - 2*log(abs(b)) - 2*log(abs(c))))*e^(x*(log(abs(a
)) + log(abs(b)) + log(abs(c))))/i
```

maple [A] time = 0.01, size = 20, normalized size = 1.05

$$\frac{a^x b^x c^x}{\ln(a) + \ln(b) + \ln(c)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(a^x*b^x*c^x,x)
```

```
[Out] a^x*b^x*c^x/(ln(a)+ln(b)+ln(c))
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x*b^x*c^x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(log(c)/log(a)+log(b)/log(a)>0)', se
e `assume?` for more details)Is log(c)/log(a)+log(b)/log(a)    equal to -1?
```

mupad [B] time = 3.51, size = 19, normalized size = 1.00

$$\frac{a^x\,b^x\,c^x}{\ln(a)+\ln(b)+\ln(c)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(a^x*b^x*c^x,x)
```

```
[Out] (a^x*b^x*c^x)/(log(a) + log(b) + log(c))
```

sympy [A] time = 2.41, size = 41, normalized size = 2.16

$$\begin{cases} \frac{a^{x} b^{x} c^{x}}{\log{(a)} + \log{(b)} + \log{(c)}} & \text{for}\: a \neq \frac{1}{b c} \\ \tilde{\infty} b^{x} c^{x} \left(\frac{1}{b}\right)^{x} \left(\frac{1}{c}\right)^{x} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a**x*b**x*c**x,x)
```

```
[Out] Piecewise((a**x*b**x*c**x/(log(a) + log(b) + log(c)), Ne(a, 1/(b*c))), (zoo
*b**x*c**x*(1/b)**x*(1/c)**x, True))
```

3.570 $\int a^x b^{-x} \, dx$

Optimal. Leaf size=18

$$\frac{a^x b^{-x}}{\log(a) - \log(b)}$$

```
[Out] a^x/(b^x)/(ln(a)-ln(b))
```

Rubi [A] time = 0.02, antiderivative size = 18, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {2287, 2194}

$$\frac{a^x b^{-x}}{\log(a) - \log(b)}$$

Antiderivative was successfully verified.

```
[In] Int[a^x/b^x,x]
```

```
[Out] a^x/(b^x*(Log[a] - Log[b]))
```

Rule 2194

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 2287

```
Int[(u_.)*(F_)^(v_)*(G_)^(w_), x_Symbol] :> With[{z = v*Log[F] + w*Log[G]},
 Int[u*NormalizeIntegrand[E^z, x], x] /; BinomialQ[z, x] || (PolynomialQ[z,
 x] && LeQ[Exponent[z, x], 2])] /; FreeQ[{F, G}, x]
```

Rubi steps

$$\begin{aligned} \int a^x b^{-x} \, dx &= \int e^{x(\log(a)-\log(b))} \, dx \\ &= \frac{a^x b^{-x}}{\log(a) - \log(b)} \end{aligned}$$

Mathematica [A] time = 0.02, size = 18, normalized size = 1.00

$$\frac{a^x b^{-x}}{\log(a) - \log(b)}$$

Antiderivative was successfully verified.

```
[In] Integrate[a^x/b^x,x]
```

```
[Out] a^x/(b^x*(Log[a] - Log[b]))
```

fricas [A] time = 0.42, size = 18, normalized size = 1.00

$$\frac{a^x}{b^x\left(\log(a) - \log(b)\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x/(b^x),x, algorithm="fricas")
```

```
[Out] a^x/(b^x*(log(a) - log(b)))
```

giac [B] time = 0.27, size = 231, normalized size = 12.83

$$2\left(\frac{2\left(\log\left(|a|\right) - \log\left(|b|\right)\right)\cos\left(-\frac{1}{2}\pi x\operatorname{sgn}(a) + \frac{1}{2}\pi x\operatorname{sgn}(b)\right)}{\left(\pi\operatorname{sgn}(a) - \pi\operatorname{sgn}(b)\right)^2 + 4\left(\log\left(|a|\right) - \log\left(|b|\right)\right)^2} - \frac{\left(\pi\operatorname{sgn}(a) - \pi\operatorname{sgn}(b)\right)\sin\left(-\frac{1}{2}\pi x\operatorname{sgn}(a) + \frac{1}{2}\pi x\operatorname{sgn}(\right.}{\left(\pi\operatorname{sgn}(a) - \pi\operatorname{sgn}(b)\right)^2 + 4\left(\log\left(|a|\right) - \log\left(|b|\right)\right)^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x/(b^x),x, algorithm="giac")
```

```
[Out] 2*(2*(log(abs(a)) - log(abs(b)))*cos(-1/2*pi*x*sgn(a) + 1/2*pi*x*sgn(b))/((
pi*sgn(a) - pi*sgn(b))^2 + 4*(log(abs(a)) - log(abs(b)))^2) - (pi*sgn(a) -
pi*sgn(b))*sin(-1/2*pi*x*sgn(a) + 1/2*pi*x*sgn(b))/((pi*sgn(a) - pi*sgn(b))
^2 + 4*(log(abs(a)) - log(abs(b)))^2))*e^(x*(log(abs(a)) - log(abs(b)))) -
(i*e^(1/2*(pi*(sgn(a) - 1) - pi*(sgn(b) - 1))*i*x)/(pi*i*sgn(a) - pi*i*sgn(
b) + 2*log(abs(a)) - 2*log(abs(b))) + i*e^(-1/2*(pi*(sgn(a) - 1) - pi*(sgn(
b) - 1))*i*x)/(pi*i*sgn(a) - pi*i*sgn(b) - 2*log(abs(a)) + 2*log(abs(b))))*
e^(x*(log(abs(a)) - log(abs(b))))/i
```

maple [A] time = 0.00, size = 19, normalized size = 1.06

$$\frac{a^x b^{-x}}{\ln(a) - \ln(b)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(a^x/(b^x),x)
```

```
[Out] a^x/(b^x)/(ln(a)-ln(b))
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x/(b^x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(-log(b)/log(a)>0)', see `assume?` f
or more details)Is -log(b)/log(a) equal to -1?
```

mupad [B] time = 3.58, size = 18, normalized size = 1.00

$$\frac{a^x}{b^x\,\left(\ln\left(a\right)-\ln\left(b\right)\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(a^x/b^x,x)
```

```
[Out] a^x/(b^x*(log(a) - log(b)))
```

sympy [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a**x/(b**x),x)
```

```
[Out] Exception raised: TypeError
```

3.571 $\int a^x b^{-x} x^2 \, dx$

Optimal. Leaf size=61

$$\frac{x^2 a^x b^{-x}}{\log(a)-\log(b)}-\frac{2xa^x b^{-x}}{(\log(a)-\log(b))^2}+\frac{2a^x b^{-x}}{(\log(a)-\log(b))^3}$$

```
[Out] 2*a^x/(b^x)/(ln(a)-ln(b))^3-2*a^x*x/(b^x)/(ln(a)-ln(b))^2+a^x*x^2/(b^x)/(ln
(a)-ln(b))
```

Rubi [A] time = 0.07, antiderivative size = 61, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {2287, 2176, 2194}

$$\frac{x^2 a^x b^{-x}}{\log(a)-\log(b)}-\frac{2xa^x b^{-x}}{(\log(a)-\log(b))^2}+\frac{2a^x b^{-x}}{(\log(a)-\log(b))^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a^x*x^2)/b^x,x]
```

```
[Out] (2*a^x)/(b^x*(Log[a] - Log[b])^3) - (2*a^x*x)/(b^x*(Log[a] - Log[b])^2) + (
a^x*x^2)/(b^x*(Log[a] - Log[b]))
```

Rule 2176

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_.), x_Symbol] :> Simp[((c + d*x)^m*(b*F^(g*(e + f*x)))^n)/(f*g*n*Log[F]),
x] - Dist[(d*m)/(f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*(b*F^(g*(e + f*x)))^n
, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && GtQ[m, 0] && IntegerQ[2*m
] &&  !$UseGamma === True
```

Rule 2194

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 2287

```
Int[(u_.)*(F_)^(v_)*(G_)^(w_), x_Symbol] :> With[{z = v*Log[F] + w*Log[G]},
 Int[u*NormalizeIntegrand[E^z, x], x] /; BinomialQ[z, x] || (PolynomialQ[z,
 x] && LeQ[Exponent[z, x], 2])] /; FreeQ[{F, G}, x]
```

Rubi steps

$$\int a^x b^{-x} x^2\,dx = \int e^{x(\log(a)-\log(b))} x^2\,dx$$
$$= \frac{a^x b^{-x} x^2}{\log(a)-\log(b)} - \frac{2\int e^{x(\log(a)-\log(b))} x\,dx}{\log(a)-\log(b)}$$
$$= -\frac{2a^x b^{-x} x}{(\log(a)-\log(b))^2} + \frac{a^x b^{-x} x^2}{\log(a)-\log(b)} + \frac{2\int e^{x(\log(a)-\log(b))}\,dx}{(\log(a)-\log(b))^2}$$
$$= \frac{2a^x b^{-x}}{(\log(a)-\log(b))^3} - \frac{2a^x b^{-x} x}{(\log(a)-\log(b))^2} + \frac{a^x b^{-x} x^2}{\log(a)-\log(b)}$$

Mathematica [A] time = 0.03, size = 43, normalized size = 0.70

$$\frac{a^x b^{-x} \left(x^2(\log(a)-\log(b))^2 - 2x(\log(a)-\log(b)) + 2\right)}{(\log(a)-\log(b))^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a^x*x^2)/b^x,x]
```

```
[Out] (a^x*(2 - 2*x*(Log[a] - Log[b]) + x^2*(Log[a] - Log[b])^2))/(b^x*(Log[a] - Log[b])^3)
```

fricas [A] time = 0.41, size = 75, normalized size = 1.23

$$\frac{\left(x^2\log(a)^2 + x^2\log(b)^2 - 2\,x\log(a) - 2\left(x^2\log(a) - x\right)\log(b) + 2\right)a^x}{\left(\log(a)^3 - 3\,\log(a)^2\log(b) + 3\,\log(a)\log(b)^2 - \log(b)^3\right)b^x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x*x^2/(b^x),x, algorithm="fricas")
```

```
[Out] (x^2*log(a)^2 + x^2*log(b)^2 - 2*x*log(a) - 2*(x^2*log(a) - x)*log(b) + 2)*a^x/((log(a)^3 - 3*log(a)^2*log(b) + 3*log(a)*log(b)^2 - log(b)^3)*b^x)
```

giac [B] time = 0.36, size = 1859, normalized size = 30.48

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x*x^2/(b^x),x, algorithm="giac")
```

```
[Out] (((pi^2*x^2*sgn(a)*sgn(b) - pi^2*x^2 + 2*x^2*log(abs(a))^2 - 4*x^2*log(abs(
a))*log(abs(b)) + 2*x^2*log(abs(b))^2 - 4*x*log(abs(a)) + 4*x*log(abs(b)) +
 4)*(3*pi^2*log(abs(a))*sgn(a)*sgn(b) - 3*pi^2*log(abs(b))*sgn(a)*sgn(b) -
3*pi^2*log(abs(a)) + 2*log(abs(a))^3 + 3*pi^2*log(abs(b)) - 6*log(abs(a))^2
*log(abs(b)) + 6*log(abs(a))*log(abs(b))^2 - 2*log(abs(b))^3)/((3*pi^2*log(
abs(a))*sgn(a)*sgn(b) - 3*pi^2*log(abs(b))*sgn(a)*sgn(b) - 3*pi^2*log(abs(a
)) + 2*log(abs(a))^3 + 3*pi^2*log(abs(b)) - 6*log(abs(a))^2*log(abs(b)) + 6
*log(abs(a))*log(abs(b))^2 - 2*log(abs(b))^3)^2 + (pi^3*sgn(a) - 3*pi*log(a
bs(a))^2*sgn(a) + 6*pi*log(abs(a))*log(abs(b))*sgn(a) - 3*pi*log(abs(b))^2*
sgn(a) - pi^3*sgn(b) + 3*pi*log(abs(a))^2*sgn(b) - 6*pi*log(abs(a))*log(abs
(b))*sgn(b) + 3*pi*log(abs(b))^2*sgn(b))^2) - 2*(pi*x^2*log(abs(a))*sgn(a)
- pi*x^2*log(abs(b))*sgn(a) - pi*x^2*log(abs(a))*sgn(b) + pi*x^2*log(abs(b)
)*sgn(b) - pi*x*sgn(a) + pi*x*sgn(b))*(pi^3*sgn(a) - 3*pi*log(abs(a))^2*sgn
(a) + 6*pi*log(abs(a))*log(abs(b))*sgn(a) - 3*pi*log(abs(b))^2*sgn(a) - pi^
3*sgn(b) + 3*pi*log(abs(a))^2*sgn(b) - 6*pi*log(abs(a))*log(abs(b))*sgn(b)
+ 3*pi*log(abs(b))^2*sgn(b))/((3*pi^2*log(abs(a))*sgn(a)*sgn(b) - 3*pi^2*lo
g(abs(b))*sgn(a)*sgn(b) - 3*pi^2*log(abs(a)) + 2*log(abs(a))^3 + 3*pi^2*log
(abs(b)) - 6*log(abs(a))^2*log(abs(b)) + 6*log(abs(a))*log(abs(b))^2 - 2*lo
g(abs(b))^3)^2 + (pi^3*sgn(a) - 3*pi*log(abs(a))^2*sgn(a) + 6*pi*log(abs(a)
)*log(abs(b))*sgn(a) - 3*pi*log(abs(b))^2*sgn(a) - pi^3*sgn(b) + 3*pi*log(a
bs(a))^2*sgn(b) - 6*pi*log(abs(a))*log(abs(b))*sgn(b) + 3*pi*log(abs(b))^2*
sgn(b))^2))*cos(-1/2*pi*x*sgn(a) + 1/2*pi*x*sgn(b)) + (2*(pi*x^2*log(abs(a)
)*sgn(a) - pi*x^2*log(abs(b))*sgn(a) - pi*x^2*log(abs(a))*sgn(b) + pi*x^2*l
og(abs(b))*sgn(b) - pi*x*sgn(a) + pi*x*sgn(b))*(3*pi^2*log(abs(a))*sgn(a)*s
gn(b) - 3*pi^2*log(abs(b))*sgn(a)*sgn(b) - 3*pi^2*log(abs(a)) + 2*log(abs(a
))^3 + 3*pi^2*log(abs(b)) - 6*log(abs(a))^2*log(abs(b)) + 6*log(abs(a))*log
(abs(b))^2 - 2*log(abs(b))^3)/((3*pi^2*log(abs(a))*sgn(a)*sgn(b) - 3*pi^2*l
og(abs(b))*sgn(a)*sgn(b) - 3*pi^2*log(abs(a)) + 2*log(abs(a))^3 + 3*pi^2*lo
g(abs(b)) - 6*log(abs(a))^2*log(abs(b)) + 6*log(abs(a))*log(abs(b))^2 - 2*l
og(abs(b))^3)^2 + (pi^3*sgn(a) - 3*pi*log(abs(a))^2*sgn(a) + 6*pi*log(abs(a
))*log(abs(b))*sgn(a) - 3*pi*log(abs(b))^2*sgn(a) - pi^3*sgn(b) + 3*pi*log(
abs(a))^2*sgn(b) - 6*pi*log(abs(a))*log(abs(b))*sgn(b) + 3*pi*log(abs(b))^2
*sgn(b))^2) + (pi^2*x^2*sgn(a)*sgn(b) - pi^2*x^2 + 2*x^2*log(abs(a))^2 - 4*
x^2*log(abs(a))*log(abs(b)) + 2*x^2*log(abs(b))^2 - 4*x*log(abs(a)) + 4*x*l
og(abs(b)) + 4)*(pi^3*sgn(a) - 3*pi*log(abs(a))^2*sgn(a) + 6*pi*log(abs(a))
*log(abs(b))*sgn(a) - 3*pi*log(abs(b))^2*sgn(a) - pi^3*sgn(b) + 3*pi*log(ab
s(a))^2*sgn(b) - 6*pi*log(abs(a))*log(abs(b))*sgn(b) + 3*pi*log(abs(b))^2*s
gn(b))/((3*pi^2*log(abs(a))*sgn(a)*sgn(b) - 3*pi^2*log(abs(b))*sgn(a)*sgn(b
) - 3*pi^2*log(abs(a)) + 2*log(abs(a))^3 + 3*pi^2*log(abs(b)) - 6*log(abs(a
))^2*log(abs(b)) + 6*log(abs(a))*log(abs(b))^2 - 2*log(abs(b))^3)^2 + (pi^3
*sgn(a) - 3*pi*log(abs(a))^2*sgn(a) + 6*pi*log(abs(a))*log(abs(b))*sgn(a) -
 3*pi*log(abs(b))^2*sgn(a) - pi^3*sgn(b) + 3*pi*log(abs(a))^2*sgn(b) - 6*pi
*log(abs(a))*log(abs(b))*sgn(b) + 3*pi*log(abs(b))^2*sgn(b))^2))*sin(-1/2*p
i*x*sgn(a) + 1/2*pi*x*sgn(b)))*e^(x*(log(abs(a)) - log(abs(b)))) + 1/2*((pi
^2*i*x^2*sgn(a)*sgn(b) - pi^2*i*x^2 + 2*i*x^2*log(abs(a))^2 - 4*i*x^2*log(a
```

```
bs(a))*log(abs(b)) + 2*i*x^2*log(abs(b))^2 - 2*pi*x^2*log(abs(a))*sgn(a) +
2*pi*x^2*log(abs(b))*sgn(a) + 2*pi*x^2*log(abs(a))*sgn(b) - 2*pi*x^2*log(ab
s(b))*sgn(b) - 4*i*x*log(abs(a)) + 4*i*x*log(abs(b)) + 2*pi*x*sgn(a) - 2*pi
*x*sgn(b) + 4*i)*e^(1/2*(pi*(sgn(a) - 1) - pi*(sgn(b) - 1))*i*x)/(pi^3*i*sg
n(a) - 3*pi*i*log(abs(a))^2*sgn(a) + 6*pi*i*log(abs(a))*log(abs(b))*sgn(a)
- 3*pi*i*log(abs(b))^2*sgn(a) - pi^3*i*sgn(b) + 3*pi*i*log(abs(a))^2*sgn(b)
 - 6*pi*i*log(abs(a))*log(abs(b))*sgn(b) + 3*pi*i*log(abs(b))^2*sgn(b) - 3*
pi^2*log(abs(a))*sgn(a)*sgn(b) + 3*pi^2*log(abs(b))*sgn(a)*sgn(b) + 3*pi^2*
log(abs(a)) - 2*log(abs(a))^3 - 3*pi^2*log(abs(b)) + 6*log(abs(a))^2*log(ab
s(b)) - 6*log(abs(a))*log(abs(b))^2 + 2*log(abs(b))^3) + (pi^2*i*x^2*sgn(a)
*sgn(b) - pi^2*i*x^2 + 2*i*x^2*log(abs(a))^2 - 4*i*x^2*log(abs(a))*log(abs(
b)) + 2*i*x^2*log(abs(b))^2 + 2*pi*x^2*log(abs(a))*sgn(a) - 2*pi*x^2*log(ab
s(b))*sgn(a) - 2*pi*x^2*log(abs(a))*sgn(b) + 2*pi*x^2*log(abs(b))*sgn(b) -
4*i*x*log(abs(a)) + 4*i*x*log(abs(b)) - 2*pi*x*sgn(a) + 2*pi*x*sgn(b) + 4*i
)*e^(-1/2*(pi*(sgn(a) - 1) - pi*(sgn(b) - 1))*i*x)/(pi^3*i*sgn(a) - 3*pi*i*
log(abs(a))^2*sgn(a) + 6*pi*i*log(abs(a))*log(abs(b))*sgn(a) - 3*pi*i*log(a
bs(b))^2*sgn(a) - pi^3*i*sgn(b) + 3*pi*i*log(abs(a))^2*sgn(b) - 6*pi*i*log(
abs(a))*log(abs(b))*sgn(b) + 3*pi*i*log(abs(b))^2*sgn(b) + 3*pi^2*log(abs(a
))*sgn(a)*sgn(b) - 3*pi^2*log(abs(b))*sgn(a)*sgn(b) - 3*pi^2*log(abs(a)) +
2*log(abs(a))^3 + 3*pi^2*log(abs(b)) - 6*log(abs(a))^2*log(abs(b)) + 6*log(
abs(a))*log(abs(b))^2 - 2*log(abs(b))^3))*e^(x*(log(abs(a)) - log(abs(b))))
/i
```

maple [A] time = 0.01, size = 73, normalized size = 1.20

$$\frac{\left(x^2\ln(a)^2-2x^2\ln(a)\ln(b)+x^2\ln(b)^2-2x\ln(a)+2x\ln(b)+2\right)a^x b^{-x}}{(\ln(a)-\ln(b))\left(\ln(a)^2-2\ln(a)\ln(b)+\ln(b)^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(a^x*x^2/(b^x),x)
```

```
[Out] (x^2*ln(a)^2-2*x^2*ln(a)*ln(b)+x^2*ln(b)^2-2*x*ln(a)+2*x*ln(b)+2)*a^x/(ln(a
)-ln(b))/(ln(a)^2-2*ln(a)*ln(b)+ln(b)^2)/(b^x)
```

maxima [A] time = 0.97, size = 72, normalized size = 1.18

$$\frac{\left(\left(\log(a)^2-2\,\log(a)\log(b)+\log(b)^2\right)x^2-2\,x\left(\log(a)-\log(b)\right)+2\right)e^{\left(x\log(a)-x\log(b)\right)}}{\log(a)^3-3\,\log(a)^2\log(b)+3\,\log(a)\log(b)^2-\log(b)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a^x*x^2/(b^x),x, algorithm="maxima")
```

```
[Out] ((log(a)^2 - 2*log(a)*log(b) + log(b)^2)*x^2 - 2*x*(log(a) - log(b)) + 2)*e
^(x*log(a) - x*log(b))/(log(a)^3 - 3*log(a)^2*log(b) + 3*log(a)*log(b)^2 -
log(b)^3)
```

mupad [B] time = 3.56, size = 43, normalized size = 0.70

$$\frac{a^x\,\left(x^2\,{\left(\ln(a)-\ln(b)\right)}^2-2\,x\,\left(\ln(a)-\ln(b)\right)+2\right)}{b^x\,{\left(\ln(a)-\ln(b)\right)}^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^x*x^2)/b^x,x)
```

```
[Out] (a^x*(x^2*(log(a) - log(b))^2 - 2*x*(log(a) - log(b)) + 2))/(b^x*(log(a) -
log(b))^3)
```

sympy [A] time = 1.74, size = 333, normalized size = 5.46

$$\begin{cases} \frac{a^{x} x^{2} \log{\left(a \right)}^{2}}{b^{x} \log{\left(a \right)}^{3} - 3 b^{x} \log{\left(a \right)}^{2} \log{\left(b \right)} + 3 b^{x} \log{\left(a \right)} \log{\left(b \right)}^{2} - b^{x} \log{\left(b \right)}^{3}} - \frac{2 a^{x} x^{2} \log{\left(a \right)} \log{\left(b \right)}}{b^{x} \log{\left(a \right)}^{3} - 3 b^{x} \log{\left(a \right)}^{2} \log{\left(b \right)} + 3 b^{x} \log{\left(a \right)} \log{\left(b \right)}^{2} - b^{x} \log{\left(b \right)}^{3}} + \frac{}{b^{x} \log{\left(a \right)}^{3} - 3 b^{x}} \\ \frac{x^{3}}{3} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a**x*x**2/(b**x),x)
```

```
[Out] Piecewise((a**x*x**2*log(a)**2/(b**x*log(a)**3 - 3*b**x*log(a)**2*log(b) +
3*b**x*log(a)*log(b)**2 - b**x*log(b)**3) - 2*a**x*x**2*log(a)*log(b)/(b**x
*log(a)**3 - 3*b**x*log(a)**2*log(b) + 3*b**x*log(a)*log(b)**2 - b**x*log(b
)**3) + a**x*x**2*log(b)**2/(b**x*log(a)**3 - 3*b**x*log(a)**2*log(b) + 3*b
**x*log(a)*log(b)**2 - b**x*log(b)**3) - 2*a**x*x*log(a)/(b**x*log(a)**3 -
3*b**x*log(a)**2*log(b) + 3*b**x*log(a)*log(b)**2 - b**x*log(b)**3) + 2*a**
x*x*log(b)/(b**x*log(a)**3 - 3*b**x*log(a)**2*log(b) + 3*b**x*log(a)*log(b)
**2 - b**x*log(b)**3) + 2*a**x/(b**x*log(a)**3 - 3*b**x*log(a)**2*log(b) +
3*b**x*log(a)*log(b)**2 - b**x*log(b)**3), Ne(a, b)), (x**3/3, True))
```

3.572 $\int \frac{(d+ee^{h+ix})(f+gx)^3}{a+be^{h+ix}+ce^{2h+2ix}}\,dx$

Optimal. Leaf size=770

$$\frac{6g^2(f+gx)\left(\frac{2cd-be}{\sqrt{b^2-4ac}}+e\right)\mathrm{Li}_3\left(-\frac{2ce^{h+ix}}{b-\sqrt{b^2-4ac}}\right)}{i^3\left(b-\sqrt{b^2-4ac}\right)}+\frac{6g^2(f+gx)\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)\mathrm{Li}_3\left(-\frac{2ce^{h+ix}}{b+\sqrt{b^2-4ac}}\right)}{i^3\left(\sqrt{b^2-4ac}+b\right)}-\frac{3g(f+gx)^2\left(\frac{2cd-be}{\sqrt{b^2-4ac}}\right.}{i^2\left(b-\sqrt{\right.}}$$

```
[Out] 1/4*(g*x+f)^4*(e+(-b*e+2*c*d)/(-4*a*c+b^2)^(1/2))/g/(b-(-4*a*c+b^2)^(1/2))-
(g*x+f)^3*ln(1+2*c*exp(i*x+h)/(b-(-4*a*c+b^2)^(1/2)))*(e+(-b*e+2*c*d)/(-4*a
*c+b^2)^(1/2))/i/(b-(-4*a*c+b^2)^(1/2))-3*g*(g*x+f)^2*polylog(2,-2*c*exp(i*
x+h)/(b-(-4*a*c+b^2)^(1/2)))*(e+(-b*e+2*c*d)/(-4*a*c+b^2)^(1/2))/i^2/(b-(-4
*a*c+b^2)^(1/2))+6*g^2*(g*x+f)*polylog(3,-2*c*exp(i*x+h)/(b-(-4*a*c+b^2)^(1
/2)))*(e+(-b*e+2*c*d)/(-4*a*c+b^2)^(1/2))/i^3/(b-(-4*a*c+b^2)^(1/2))-6*g^3*
polylog(4,-2*c*exp(i*x+h)/(b-(-4*a*c+b^2)^(1/2)))*(e+(-b*e+2*c*d)/(-4*a*c+b
^2)^(1/2))/i^4/(b-(-4*a*c+b^2)^(1/2))+1/4*(g*x+f)^4*(e+(b*e-2*c*d)/(-4*a*c+
b^2)^(1/2))/g/(b+(-4*a*c+b^2)^(1/2))-(g*x+f)^3*ln(1+2*c*exp(i*x+h)/(b+(-4*a
*c+b^2)^(1/2)))*(e+(b*e-2*c*d)/(-4*a*c+b^2)^(1/2))/i/(b+(-4*a*c+b^2)^(1/2))
-3*g*(g*x+f)^2*polylog(2,-2*c*exp(i*x+h)/(b+(-4*a*c+b^2)^(1/2)))*(e+(b*e-2*
c*d)/(-4*a*c+b^2)^(1/2))/i^2/(b+(-4*a*c+b^2)^(1/2))+6*g^2*(g*x+f)*polylog(3
,-2*c*exp(i*x+h)/(b+(-4*a*c+b^2)^(1/2)))*(e+(b*e-2*c*d)/(-4*a*c+b^2)^(1/2))
/i^3/(b+(-4*a*c+b^2)^(1/2))-6*g^3*polylog(4,-2*c*exp(i*x+h)/(b+(-4*a*c+b^2)
^(1/2)))*(e+(b*e-2*c*d)/(-4*a*c+b^2)^(1/2))/i^4/(b+(-4*a*c+b^2)^(1/2))
```

Rubi [A] time = 1.37, antiderivative size = 770, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 7, integrand size = 44, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.159, Rules used = {2265, 2184, 2190, 2531, 6609, 2282, 6589}

$$\frac{6g^2(f+gx)\left(\frac{2cd-be}{\sqrt{b^2-4ac}}+e\right)\mathrm{PolyLog}\left(3,-\frac{2ce^{h+ix}}{b-\sqrt{b^2-4ac}}\right)}{i^3\left(b-\sqrt{b^2-4ac}\right)}+\frac{6g^2(f+gx)\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)\mathrm{PolyLog}\left(3,-\frac{2ce^{h+ix}}{\sqrt{b^2-4ac}+b}\right)}{i^3\left(\sqrt{b^2-4ac}+b\right)}-\frac{3g(f}{}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*E^(h + i*x))*(f + g*x)^3)/(a + b*E^(h + i*x) + c*E^(2*h + 2*i*x
)),x]
```

```
[Out] ((e - (2*c*d - b*e)/Sqrt[b^2 - 4*a*c])*(f + g*x)^4)/(4*(b + Sqrt[b^2 - 4*a*
c])*g) + ((e + (2*c*d - b*e)/Sqrt[b^2 - 4*a*c])*(f + g*x)^4)/(4*(b - Sqrt[b
^2 - 4*a*c])*g) - ((e + (2*c*d - b*e)/Sqrt[b^2 - 4*a*c])*(f + g*x)^3*Log[1
+ (2*c*E^(h + i*x))/(b - Sqrt[b^2 - 4*a*c])])/((b - Sqrt[b^2 - 4*a*c])*i) -
 ((e - (2*c*d - b*e)/Sqrt[b^2 - 4*a*c])*(f + g*x)^3*Log[1 + (2*c*E^(h + i*x
))/(b + Sqrt[b^2 - 4*a*c])])/((b + Sqrt[b^2 - 4*a*c])*i) - (3*(e + (2*c*d -
```

```
 b*e)/Sqrt[b^2 - 4*a*c])*g*(f + g*x)^2*PolyLog[2, (-2*c*E^(h + i*x))/(b - S
qrt[b^2 - 4*a*c])])/((b - Sqrt[b^2 - 4*a*c])*i^2) - (3*(e - (2*c*d - b*e)/S
qrt[b^2 - 4*a*c])*g*(f + g*x)^2*PolyLog[2, (-2*c*E^(h + i*x))/(b + Sqrt[b^2
 - 4*a*c])])/((b + Sqrt[b^2 - 4*a*c])*i^2) + (6*(e + (2*c*d - b*e)/Sqrt[b^2
 - 4*a*c])*g^2*(f + g*x)*PolyLog[3, (-2*c*E^(h + i*x))/(b - Sqrt[b^2 - 4*a*
c])])/((b - Sqrt[b^2 - 4*a*c])*i^3) + (6*(e - (2*c*d - b*e)/Sqrt[b^2 - 4*a*
c])*g^2*(f + g*x)*PolyLog[3, (-2*c*E^(h + i*x))/(b + Sqrt[b^2 - 4*a*c])])/(
(b + Sqrt[b^2 - 4*a*c])*i^3) - (6*(e + (2*c*d - b*e)/Sqrt[b^2 - 4*a*c])*g^3
*PolyLog[4, (-2*c*E^(h + i*x))/(b - Sqrt[b^2 - 4*a*c])])/((b - Sqrt[b^2 - 4
*a*c])*i^4) - (6*(e - (2*c*d - b*e)/Sqrt[b^2 - 4*a*c])*g^3*PolyLog[4, (-2*c
*E^(h + i*x))/(b + Sqrt[b^2 - 4*a*c])])/((b + Sqrt[b^2 - 4*a*c])*i^4)
```

Rule 2184

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[((c + d*x)^m*(F^(g*(e + f*x)))^n)/(a + b*(F^(g*(e + f*x)))^n), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2265

```
Int[(((i_.)*(F_)^(u_) + (h_))*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F
_)^(u_) + (c_.)*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dis
t[Simplify[(2*c*h - b*i)/q] + i, Int[(f + g*x)^m/(b - q + 2*c*F^u), x], x]
- Dist[Simplify[(2*c*h - b*i)/q] - i, Int[(f + g*x)^m/(b + q + 2*c*F^u), x]
, x]] /; FreeQ[{F, a, b, c, f, g, h, i}, x] && EqQ[v, 2*u] && LinearQ[u, x]
 && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\int \frac{\left(d+ee^{h+572x}\right)(f+gx)^3}{a+be^{h+572x}+ce^{2h+1144x}}\,dx = -\left(\left(-e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)\int \frac{(f+gx)^3}{b+\sqrt{b^2-4ac}+2ce^{h+572x}}\,dx\right)+\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)\int$$

$$= \frac{\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^4}{4\left(b+\sqrt{b^2-4ac}\right)g}+\frac{\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^4}{4\left(b-\sqrt{b^2-4ac}\right)g}-\frac{\left(2c\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)\right)\int \frac{e^{h+}}{b+\sqrt{b^2}}}{b+\sqrt{b^2-4a}}$$

$$= \frac{\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^4}{4\left(b+\sqrt{b^2-4ac}\right)g}+\frac{\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^4}{4\left(b-\sqrt{b^2-4ac}\right)g}-\frac{\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^3\log}{572\left(b-\sqrt{b^2-}\right.}$$

$$= \frac{\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^4}{4\left(b+\sqrt{b^2-4ac}\right)g}+\frac{\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^4}{4\left(b-\sqrt{b^2-4ac}\right)g}-\frac{\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^3\log}{572\left(b-\sqrt{b^2-}\right.}$$

$$= \frac{\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^4}{4\left(b+\sqrt{b^2-4ac}\right)g}+\frac{\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^4}{4\left(b-\sqrt{b^2-4ac}\right)g}-\frac{\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^3\log}{572\left(b-\sqrt{b^2-}\right.}$$

$$= \frac{\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^4}{4\left(b+\sqrt{b^2-4ac}\right)g}+\frac{\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^4}{4\left(b-\sqrt{b^2-4ac}\right)g}-\frac{\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^3\log}{572\left(b-\sqrt{b^2-}\right.}$$

$$= \frac{\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^4}{4\left(b+\sqrt{b^2-4ac}\right)g}+\frac{\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^4}{4\left(b-\sqrt{b^2-4ac}\right)g}-\frac{\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^3\log}{572\left(b-\sqrt{b^2-}\right.}$$

Mathematica [B] time = 4.68, size = 2441, normalized size = 3.17

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*E^(h + i*x))*(f + g*x)^3)/(a + b*E^(h + i*x) + c*E^(2*h +
 2*i*x)),x]

[Out] -1/4*(-4*Sqrt[-(b^2 - 4*a*c)^2]*d*f^3*i^4*x - 6*Sqrt[-(b^2 - 4*a*c)^2]*d*f^
2*g*i^4*x^2 - 4*Sqrt[-(b^2 - 4*a*c)^2]*d*f*g^2*i^4*x^3 - Sqrt[-(b^2 - 4*a*c
)^2]*d*g^3*i^4*x^4 + 4*b*Sqrt[b^2 - 4*a*c]*d*f^3*i^3*ArcTan[(b + 2*c*E^(h +
 i*x))/Sqrt[-b^2 + 4*a*c]] + 8*a*Sqrt[-b^2 + 4*a*c]*e*f^3*i^3*ArcTanh[(b +
2*c*E^(h + i*x))/Sqrt[b^2 - 4*a*c]] + 6*Sqrt[-(b^2 - 4*a*c)^2]*d*f^2*g*i^3*
```

x*Log[1 + (2*c*E^(h + i*x))/(b - Sqrt[b^2 - 4*a*c])] + 6*b*Sqrt[-b^2 + 4*a*c]*d*f^2*g*i^3*x*Log[1 + (2*c*E^(h + i*x))/(b - Sqrt[b^2 - 4*a*c])] - 12*a*Sqrt[-b^2 + 4*a*c]*e*f^2*g*i^3*x*Log[1 + (2*c*E^(h + i*x))/(b - Sqrt[b^2 - 4*a*c])] + 6*Sqrt[-(b^2 - 4*a*c)^2]*d*f*g^2*i^3*x^2*Log[1 + (2*c*E^(h + i*x))/(b - Sqrt[b^2 - 4*a*c])] + 6*b*Sqrt[-b^2 + 4*a*c]*d*f*g^2*i^3*x^2*Log[1 + (2*c*E^(h + i*x))/(b - Sqrt[b^2 - 4*a*c])] - 12*a*Sqrt[-b^2 + 4*a*c]*e*f*g^2*i^3*x^2*Log[1 + (2*c*E^(h + i*x))/(b - Sqrt[b^2 - 4*a*c])] + 2*Sqrt[-(b^2 - 4*a*c)^2]*d*g^3*i^3*x^3*Log[1 + (2*c*E^(h + i*x))/(b - Sqrt[b^2 - 4*a*c])] + 2*b*Sqrt[-b^2 + 4*a*c]*d*g^3*i^3*x^3*Log[1 + (2*c*E^(h + i*x))/(b - Sqrt[b^2 - 4*a*c])] - 4*a*Sqrt[-b^2 + 4*a*c]*e*g^3*i^3*x^3*Log[1 + (2*c*E^(h + i*x))/(b - Sqrt[b^2 - 4*a*c])] + 6*Sqrt[-(b^2 - 4*a*c)^2]*d*f^2*g*i^3*x*Log[1 + (2*c*E^(h + i*x))/(b + Sqrt[b^2 - 4*a*c])] - 6*b*Sqrt[-b^2 + 4*a*c]*d*f^2*g*i^3*x*Log[1 + (2*c*E^(h + i*x))/(b + Sqrt[b^2 - 4*a*c])] + 12*a*Sqrt[-b^2 + 4*a*c]*e*f^2*g*i^3*x*Log[1 + (2*c*E^(h + i*x))/(b + Sqrt[b^2 - 4*a*c])] + 6*Sqrt[-(b^2 - 4*a*c)^2]*d*f*g^2*i^3*x^2*Log[1 + (2*c*E^(h + i*x))/(b + Sqrt[b^2 - 4*a*c])] - 6*b*Sqrt[-b^2 + 4*a*c]*d*f*g^2*i^3*x^2*Log[1 + (2*c*E^(h + i*x))/(b + Sqrt[b^2 - 4*a*c])] + 12*a*Sqrt[-b^2 + 4*a*c]*e*f*g^2*i^3*x^2*Log[1 + (2*c*E^(h + i*x))/(b + Sqrt[b^2 - 4*a*c])] + 2*Sqrt[-(b^2 - 4*a*c)^2]*d*g^3*i^3*x^3*Log[1 + (2*c*E^(h + i*x))/(b + Sqrt[b^2 - 4*a*c])] - 2*b*Sqrt[-b^2 + 4*a*c]*d*g^3*i^3*x^3*Log[1 + (2*c*E^(h + i*x))/(b + Sqrt[b^2 - 4*a*c])] + 4*a*Sqrt[-b^2 + 4*a*c]*e*g^3*i^3*x^3*Log[1 + (2*c*E^(h + i*x))/(b + Sqrt[b^2 - 4*a*c])] + 2*Sqrt[-(b^2 - 4*a*c)^2]*d*f^3*i^3*Log[a + E^(h + i*x)*(b + c*E^(h + i*x))] + 6*(Sqrt[-(b^2 - 4*a*c)^2]*d + b*Sqrt[-b^2 + 4*a*c]*d - 2*a*Sqrt[-b^2 + 4*a*c]*e)*g*i^2*(f + g*x)^2*PolyLog[2, (2*c*E^(h + i*x))/(-b + Sqrt[b^2 - 4*a*c])] + 6*(Sqrt[-(b^2 - 4*a*c)^2]*d - b*Sqrt[-b^2 + 4*a*c]*d + 2*a*Sqrt[-b^2 + 4*a*c]*e)*g*i^2*(f + g*x)^2*PolyLog[2, (-2*c*E^(h + i*x))/(b + Sqrt[b^2 - 4*a*c])] - 12*Sqrt[-(b^2 - 4*a*c)^2]*d*f*g^2*i*PolyLog[3, (2*c*E^(h + i*x))/(-b + Sqrt[b^2 - 4*a*c])] - 12*b*Sqrt[-b^2 + 4*a*c]*d*f*g^2*i*PolyLog[3, (2*c*E^(h + i*x))/(-b + Sqrt[b^2 - 4*a*c])] + 24*a*Sqrt[-b^2 + 4*a*c]*e*f*g^2*i*PolyLog[3, (2*c*E^(h + i*x))/(-b + Sqrt[b^2 - 4*a*c])] - 12*Sqrt[-(b^2 - 4*a*c)^2]*d*g^3*i*x*PolyLog[3, (2*c*E^(h + i*x))/(-b + Sqrt[b^2 - 4*a*c])] - 12*b*Sqrt[-b^2 + 4*a*c]*d*g^3*i*x*PolyLog[3, (2*c*E^(h + i*x))/(-b + Sqrt[b^2 - 4*a*c])] + 24*a*Sqrt[-b^2 + 4*a*c]*e*g^3*i*x*PolyLog[3, (2*c*E^(h + i*x))/(-b + Sqrt[b^2 - 4*a*c])] - 12*Sqrt[-(b^2 - 4*a*c)^2]*d*f*g^2*i*PolyLog[3, (-2*c*E^(h + i*x))/(b + Sqrt[b^2 - 4*a*c])] + 12*b*Sqrt[-b^2 + 4*a*c]*d*f*g^2*i*PolyLog[3, (-2*c*E^(h + i*x))/(b + Sqrt[b^2 - 4*a*c])] - 24*a*Sqrt[-b^2 + 4*a*c]*e*f*g^2*i*PolyLog[3, (-2*c*E^(h + i*x))/(b + Sqrt[b^2 - 4*a*c])] - 12*Sqrt[-(b^2 - 4*a*c)^2]*d*g^3*i*x*PolyLog[3, (-2*c*E^(h + i*x))/(b + Sqrt[b^2 - 4*a*c])] + 12*b*Sqrt[-b^2 + 4*a*c]*d*g^3*i*x*PolyLog[3, (-2*c*E^(h + i*x))/(b + Sqrt[b^2 - 4*a*c])] - 24*a*Sqrt[-b^2 + 4*a*c]*e*g^3*i*x*PolyLog[3, (-2*c*E^(h + i*x))/(b + Sqrt[b^2 - 4*a*c])] + 12*Sqrt[-(b^2 - 4*a*c)^2]*d*g^3*PolyLog[4, (2*c*E^(h + i*x))/(-b + Sqrt[b^2 - 4*a*c])] + 12*b*Sqrt[-b^2 + 4*a*c]*d*g^3*PolyLog[4, (2*c*E^(h + i*x))/(-b + Sqrt[b^2 - 4*a*c])] - 24*a*Sqrt[-b^2 + 4*a*c]*e*g^3*PolyLog[4, (2*c*E^(h + i*x))/(-b + Sqrt[b^2 - 4*a*c])] + 12*Sqrt[-(b

```
^2 - 4*a*c)^2]*d*g^3*PolyLog[4, (-2*c*E^(h + i*x))/(b + Sqrt[b^2 - 4*a*c])]
 - 12*b*Sqrt[-b^2 + 4*a*c]*d*g^3*PolyLog[4, (-2*c*E^(h + i*x))/(b + Sqrt[b^
2 - 4*a*c])] + 24*a*Sqrt[-b^2 + 4*a*c]*e*g^3*PolyLog[4, (-2*c*E^(h + i*x))/
(b + Sqrt[b^2 - 4*a*c])])/(a*Sqrt[-(b^2 - 4*a*c)^2]*i^4)
```

fricas [C] time = 0.51, size = 1859, normalized size = 2.41

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*exp(i*x+h))*(g*x+f)^3/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h)),x, a
lgorithm="fricas")
```

```
[Out] 1/4*((b^2 - 4*a*c)*d*g^3*i^4*x^4 + 4*(b^2 - 4*a*c)*d*f*g^2*i^4*x^3 + 6*(b^2
 - 4*a*c)*d*f^2*g*i^4*x^2 + 4*(b^2 - 4*a*c)*d*f^3*i^4*x - 6*((b^2 - 4*a*c)*
d*g^3*i^2*x^2 + 2*(b^2 - 4*a*c)*d*f*g^2*i^2*x + (b^2 - 4*a*c)*d*f^2*g*i^2 +
 ((a*b*d - 2*a^2*e)*g^3*i^2*x^2 + 2*(a*b*d - 2*a^2*e)*f*g^2*i^2*x + (a*b*d
- 2*a^2*e)*f^2*g*i^2)*sqrt((b^2 - 4*a*c)/a^2))*dilog(-1/2*(a*sqrt((b^2 - 4*
a*c)/a^2)*e^(i*x + h) + b*e^(i*x + h) + 2*a)/a + 1) - 6*((b^2 - 4*a*c)*d*g^
3*i^2*x^2 + 2*(b^2 - 4*a*c)*d*f*g^2*i^2*x + (b^2 - 4*a*c)*d*f^2*g*i^2 - ((a
*b*d - 2*a^2*e)*g^3*i^2*x^2 + 2*(a*b*d - 2*a^2*e)*f*g^2*i^2*x + (a*b*d - 2*
a^2*e)*f^2*g*i^2)*sqrt((b^2 - 4*a*c)/a^2))*dilog(1/2*(a*sqrt((b^2 - 4*a*c)/
a^2)*e^(i*x + h) - b*e^(i*x + h) - 2*a)/a + 1) + 2*((b^2 - 4*a*c)*d*g^3*h^3
 - 3*(b^2 - 4*a*c)*d*f*g^2*h^2*i + 3*(b^2 - 4*a*c)*d*f^2*g*h*i^2 - (b^2 - 4
*a*c)*d*f^3*i^3 - ((a*b*d - 2*a^2*e)*g^3*h^3 - 3*(a*b*d - 2*a^2*e)*f*g^2*h^
2*i + 3*(a*b*d - 2*a^2*e)*f^2*g*h*i^2 - (a*b*d - 2*a^2*e)*f^3*i^3)*sqrt((b^
2 - 4*a*c)/a^2))*log(2*c*e^(i*x + h) + a*sqrt((b^2 - 4*a*c)/a^2) + b) + 2*(
(b^2 - 4*a*c)*d*g^3*h^3 - 3*(b^2 - 4*a*c)*d*f*g^2*h^2*i + 3*(b^2 - 4*a*c)*d
*f^2*g*h*i^2 - (b^2 - 4*a*c)*d*f^3*i^3 + ((a*b*d - 2*a^2*e)*g^3*h^3 - 3*(a*
b*d - 2*a^2*e)*f*g^2*h^2*i + 3*(a*b*d - 2*a^2*e)*f^2*g*h*i^2 - (a*b*d - 2*a
^2*e)*f^3*i^3)*sqrt((b^2 - 4*a*c)/a^2))*log(2*c*e^(i*x + h) - a*sqrt((b^2 -
 4*a*c)/a^2) + b) - 2*((b^2 - 4*a*c)*d*g^3*i^3*x^3 + 3*(b^2 - 4*a*c)*d*f*g^
2*i^3*x^2 + 3*(b^2 - 4*a*c)*d*f^2*g*i^3*x + (b^2 - 4*a*c)*d*g^3*h^3 - 3*(b^
2 - 4*a*c)*d*f*g^2*h^2*i + 3*(b^2 - 4*a*c)*d*f^2*g*h*i^2 + ((a*b*d - 2*a^2*
e)*g^3*i^3*x^3 + 3*(a*b*d - 2*a^2*e)*f*g^2*i^3*x^2 + 3*(a*b*d - 2*a^2*e)*f^
2*g*i^3*x + (a*b*d - 2*a^2*e)*g^3*h^3 - 3*(a*b*d - 2*a^2*e)*f*g^2*h^2*i + 3
*(a*b*d - 2*a^2*e)*f^2*g*h*i^2)*sqrt((b^2 - 4*a*c)/a^2))*log(1/2*(a*sqrt((b
^2 - 4*a*c)/a^2)*e^(i*x + h) + b*e^(i*x + h) + 2*a)/a) - 2*((b^2 - 4*a*c)*d
*g^3*i^3*x^3 + 3*(b^2 - 4*a*c)*d*f*g^2*i^3*x^2 + 3*(b^2 - 4*a*c)*d*f^2*g*i^
3*x + (b^2 - 4*a*c)*d*g^3*h^3 - 3*(b^2 - 4*a*c)*d*f*g^2*h^2*i + 3*(b^2 - 4*
a*c)*d*f^2*g*h*i^2 - ((a*b*d - 2*a^2*e)*g^3*i^3*x^3 + 3*(a*b*d - 2*a^2*e)*f
*g^2*i^3*x^2 + 3*(a*b*d - 2*a^2*e)*f^2*g*i^3*x + (a*b*d - 2*a^2*e)*g^3*h^3
- 3*(a*b*d - 2*a^2*e)*f*g^2*h^2*i + 3*(a*b*d - 2*a^2*e)*f^2*g*h*i^2)*sqrt((
b^2 - 4*a*c)/a^2))*log(-1/2*(a*sqrt((b^2 - 4*a*c)/a^2)*e^(i*x + h) - b*e^(i
*x + h) - 2*a)/a) - 12*((b^2 - 4*a*c)*d*g^3 + (a*b*d - 2*a^2*e)*g^3*sqrt((b
```

```
^2 - 4*a*c)/a^2))*polylog(4, -1/2*(a*sqrt((b^2 - 4*a*c)/a^2)*e^(i*x + h) +
b*e^(i*x + h))/a) - 12*((b^2 - 4*a*c)*d*g^3 - (a*b*d - 2*a^2*e)*g^3*sqrt((b
^2 - 4*a*c)/a^2))*polylog(4, 1/2*(a*sqrt((b^2 - 4*a*c)/a^2)*e^(i*x + h) - b
*e^(i*x + h))/a) + 12*((b^2 - 4*a*c)*d*g^3*i*x + (b^2 - 4*a*c)*d*f*g^2*i +
((a*b*d - 2*a^2*e)*g^3*i*x + (a*b*d - 2*a^2*e)*f*g^2*i)*sqrt((b^2 - 4*a*c)/
a^2))*polylog(3, -1/2*(a*sqrt((b^2 - 4*a*c)/a^2)*e^(i*x + h) + b*e^(i*x + h
))/a) + 12*((b^2 - 4*a*c)*d*g^3*i*x + (b^2 - 4*a*c)*d*f*g^2*i - ((a*b*d - 2
*a^2*e)*g^3*i*x + (a*b*d - 2*a^2*e)*f*g^2*i)*sqrt((b^2 - 4*a*c)/a^2))*polyl
og(3, 1/2*(a*sqrt((b^2 - 4*a*c)/a^2)*e^(i*x + h) - b*e^(i*x + h))/a))/((a*b
^2 - 4*a^2*c)*i^4)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(gx+f)^3\left(ee^{(ix+h)}+d\right)}{ce^{(2\,ix+2\,h)}+be^{(ix+h)}+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*exp(i*x+h))*(g*x+f)^3/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h)),x, a
lgorithm="giac")
```

```
[Out] integrate((g*x + f)^3*(e*e^(i*x + h) + d)/(c*e^(2*i*x + 2*h) + b*e^(i*x + h
) + a), x)
```

maple [F] time = 0.53, size = 0, normalized size = 0.00

$$\int \frac{\left(e\,e^{ix+h}+d\right)(gx+f)^3}{b\,e^{ix+h}+c\,e^{2ix+2h}+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*exp(i*x+h))*(g*x+f)^3/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h)),x)
```

```
[Out] int((d+e*exp(i*x+h))*(g*x+f)^3/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h)),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*exp(i*x+h))*(g*x+f)^3/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h)),x, a
lgorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
```

```
elp (example of legal syntax is 'assume(4*a*c-b^2>0)', see `assume?` for mo
re details)Is 4*a*c-b^2 positive or negative?
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(f+g\,x\right)^3\,\left(d+e\,\mathrm{e}^{h+i\,x}\right)}{a+b\,\mathrm{e}^{h+i\,x}+c\,\mathrm{e}^{2\,h+2\,i\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((f + g*x)^3*(d + e*exp(h + i*x)))/(a + b*exp(h + i*x) + c*exp(2*h + 2*
i*x)),x)
```

```
[Out] int(((f + g*x)^3*(d + e*exp(h + i*x)))/(a + b*exp(h + i*x) + c*exp(2*h + 2*
i*x)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d+ee^{h}e^{ix}\right)\left(f+gx\right)^{3}}{a+be^{h}e^{ix}+ce^{2h}e^{2ix}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*exp(i*x+h))*(g*x+f)**3/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h)),x)
```

```
[Out] Integral((d + e*exp(h)*exp(i*x))*(f + g*x)**3/(a + b*exp(h)*exp(i*x) + c*ex
p(2*h)*exp(2*i*x)), x)
```

3.573 $\int \frac{\left(d+ee^{h+ix}\right)(f+gx)^2}{a+be^{h+ix}+ce^{2h+2ix}}\,dx$

Optimal. Leaf size=599

$$-\frac{2g(f+gx)\left(\frac{2cd-be}{\sqrt{b^2-4ac}}+e\right)\mathrm{Li}_2\left(-\frac{2ce^{h+ix}}{b-\sqrt{b^2-4ac}}\right)}{i^2\left(b-\sqrt{b^2-4ac}\right)}-\frac{2g(f+gx)\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)\mathrm{Li}_2\left(-\frac{2ce^{h+ix}}{b+\sqrt{b^2-4ac}}\right)}{i^2\left(\sqrt{b^2-4ac}+b\right)}-\frac{(f+gx)^2\left(\frac{2cd-be}{\sqrt{b^2-4ac}}+e \ldots\right.}{i\left(b-\sqrt{b \ldots}\right.}$$

```
[Out] 1/3*(g*x+f)^3*(e+(-b*e+2*c*d)/(-4*a*c+b^2)^(1/2))/g/(b-(-4*a*c+b^2)^(1/2))-
(g*x+f)^2*ln(1+2*c*exp(i*x+h)/(b-(-4*a*c+b^2)^(1/2)))*(e+(-b*e+2*c*d)/(-4*a
*c+b^2)^(1/2))/i/(b-(-4*a*c+b^2)^(1/2))-2*g*(g*x+f)*polylog(2,-2*c*exp(i*x+
h)/(b-(-4*a*c+b^2)^(1/2)))*(e+(-b*e+2*c*d)/(-4*a*c+b^2)^(1/2))/i^2/(b-(-4*a
*c+b^2)^(1/2))+2*g^2*polylog(3,-2*c*exp(i*x+h)/(b-(-4*a*c+b^2)^(1/2)))*(e+(
-b*e+2*c*d)/(-4*a*c+b^2)^(1/2))/i^3/(b-(-4*a*c+b^2)^(1/2))+1/3*(g*x+f)^3*(e
+(b*e-2*c*d)/(-4*a*c+b^2)^(1/2))/g/(b+(-4*a*c+b^2)^(1/2))-(g*x+f)^2*ln(1+2*
c*exp(i*x+h)/(b+(-4*a*c+b^2)^(1/2)))*(e+(b*e-2*c*d)/(-4*a*c+b^2)^(1/2))/i/(
b+(-4*a*c+b^2)^(1/2))-2*g*(g*x+f)*polylog(2,-2*c*exp(i*x+h)/(b+(-4*a*c+b^2)
^(1/2)))*(e+(b*e-2*c*d)/(-4*a*c+b^2)^(1/2))/i^2/(b+(-4*a*c+b^2)^(1/2))+2*g^
2*polylog(3,-2*c*exp(i*x+h)/(b+(-4*a*c+b^2)^(1/2)))*(e+(b*e-2*c*d)/(-4*a*c+
b^2)^(1/2))/i^3/(b+(-4*a*c+b^2)^(1/2))
```

Rubi [A] time = 1.00, antiderivative size = 599, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 6, integrand size = 44, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.136, Rules used = {2265, 2184, 2190, 2531, 2282, 6589}

$$-\frac{2g(f+gx)\left(\frac{2cd-be}{\sqrt{b^2-4ac}}+e\right)\text{PolyLog}\left(2,-\frac{2ce^{h+ix}}{b-\sqrt{b^2-4ac}}\right)}{i^2\left(b-\sqrt{b^2-4ac}\right)}-\frac{2g(f+gx)\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)\text{PolyLog}\left(2,-\frac{2ce^{h+ix}}{\sqrt{b^2-4ac}+b}\right)}{i^2\left(\sqrt{b^2-4ac}+b\right)}+\frac{2g^2 \ldots}{\ldots}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*E^(h + i*x))*(f + g*x)^2)/(a + b*E^(h + i*x) + c*E^(2*h + 2*i*x
)),x]
```

```
[Out] ((e - (2*c*d - b*e)/Sqrt[b^2 - 4*a*c])*(f + g*x)^3)/(3*(b + Sqrt[b^2 - 4*a*
c])*g) + ((e + (2*c*d - b*e)/Sqrt[b^2 - 4*a*c])*(f + g*x)^3)/(3*(b - Sqrt[b
^2 - 4*a*c])*g) - ((e + (2*c*d - b*e)/Sqrt[b^2 - 4*a*c])*(f + g*x)^2*Log[1
+ (2*c*E^(h + i*x))/(b - Sqrt[b^2 - 4*a*c])])/((b - Sqrt[b^2 - 4*a*c])*i) -
 ((e - (2*c*d - b*e)/Sqrt[b^2 - 4*a*c])*(f + g*x)^2*Log[1 + (2*c*E^(h + i*x
))/(b + Sqrt[b^2 - 4*a*c])])/((b + Sqrt[b^2 - 4*a*c])*i) - (2*(e + (2*c*d -
 b*e)/Sqrt[b^2 - 4*a*c])*g*(f + g*x)*PolyLog[2, (-2*c*E^(h + i*x))/(b - Sqr
t[b^2 - 4*a*c])])/((b - Sqrt[b^2 - 4*a*c])*i^2) - (2*(e - (2*c*d - b*e)/Sqr
t[b^2 - 4*a*c])*g*(f + g*x)*PolyLog[2, (-2*c*E^(h + i*x))/(b + Sqrt[b^2 - 4
```

```
*a*c])])/((b + Sqrt[b^2 - 4*a*c])*i^2) + (2*(e + (2*c*d - b*e)/Sqrt[b^2 - 4
*a*c])*g^2*PolyLog[3, (-2*c*E^(h + i*x))/(b - Sqrt[b^2 - 4*a*c])])/((b - Sq
rt[b^2 - 4*a*c])*i^3) + (2*(e - (2*c*d - b*e)/Sqrt[b^2 - 4*a*c])*g^2*PolyLo
g[3, (-2*c*E^(h + i*x))/(b + Sqrt[b^2 - 4*a*c])])/((b + Sqrt[b^2 - 4*a*c])*
i^3)
```

Rule 2184

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[((c + d*x)^m*(F^(g*(e + f*x)))^n)/(a + b*(F^(g*(e + f*x)))^n), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2265

```
Int[(((i_.)*(F_)^(u_) + (h_))*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F
_)^(u_) + (c_.)*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dis
t[Simplify[(2*c*h - b*i)/q] + i, Int[(f + g*x)^m/(b - q + 2*c*F^u), x], x]
- Dist[Simplify[(2*c*h - b*i)/q] - i, Int[(f + g*x)^m/(b + q + 2*c*F^u), x]
, x]] /; FreeQ[{F, a, b, c, f, g, h, i}, x] && EqQ[v, 2*u] && LinearQ[u, x]
 && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\left(d+ee^{h+573x}\right)(f+gx)^2}{a+be^{h+573x}+ce^{2h+1146x}}\,dx = -\left(\left(-e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)\int \frac{(f+gx)^2}{b+\sqrt{b^2-4ac}+2ce^{h+573x}}\,dx\right)+\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)\int$$

$$= \frac{\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^3}{3\left(b+\sqrt{b^2-4ac}\right)g}+\frac{\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^3}{3\left(b-\sqrt{b^2-4ac}\right)g}-\frac{\left(2c\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)\right)\int \frac{e}{b+\sqrt{}}}{b+\sqrt{b^2-}}$$

$$= \frac{\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^3}{3\left(b+\sqrt{b^2-4ac}\right)g}+\frac{\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^3}{3\left(b-\sqrt{b^2-4ac}\right)g}-\frac{\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^2\,l}{573\left(b-\sqrt{b^2}\right.}$$

$$= \frac{\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^3}{3\left(b+\sqrt{b^2-4ac}\right)g}+\frac{\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^3}{3\left(b-\sqrt{b^2-4ac}\right)g}-\frac{\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^2\,l}{573\left(b-\sqrt{b^2}\right.}$$

$$= \frac{\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^3}{3\left(b+\sqrt{b^2-4ac}\right)g}+\frac{\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^3}{3\left(b-\sqrt{b^2-4ac}\right)g}-\frac{\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^2\,l}{573\left(b-\sqrt{b^2}\right.}$$

$$= \frac{\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^3}{3\left(b+\sqrt{b^2-4ac}\right)g}+\frac{\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^3}{3\left(b-\sqrt{b^2-4ac}\right)g}-\frac{\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^2\,l}{573\left(b-\sqrt{b^2}\right.}$$

Mathematica [B] time = 2.68, size = 1412, normalized size = 2.36

$$-\frac{-2\sqrt{-\left(b^2-4ac\right)^2}\,dg^2x^3i^3-6\sqrt{-\left(b^2-4ac\right)^2}\,dfgx^2i^3-6\sqrt{-\left(b^2-4ac\right)^2}\,df^2xi^3+6b\sqrt{b^2-4ac}\,df^2\tan^{-1}\left(\frac{b+2}{\sqrt{4}}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*E^(h + i*x))*(f + g*x)^2)/(a + b*E^(h + i*x) + c*E^(2*h +
 2*i*x)),x]
```

```
[Out] -1/6*(-6*Sqrt[-(b^2 - 4*a*c)^2]*d*f^2*i^3*x - 6*Sqrt[-(b^2 - 4*a*c)^2]*d*f*
g*i^3*x^2 - 2*Sqrt[-(b^2 - 4*a*c)^2]*d*g^2*i^3*x^3 + 6*b*Sqrt[b^2 - 4*a*c]*
d*f^2*i^2*ArcTan[(b + 2*c*E^(h + i*x))/Sqrt[-b^2 + 4*a*c]] + 12*a*Sqrt[-b^2
 + 4*a*c]*e*f^2*i^2*ArcTanh[(b + 2*c*E^(h + i*x))/Sqrt[b^2 - 4*a*c]] + 6*Sq
rt[-(b^2 - 4*a*c)^2]*d*f*g*i^2*x*Log[1 + (2*c*E^(h + i*x))/(b - Sqrt[b^2 -
4*a*c])] + 6*b*Sqrt[-b^2 + 4*a*c]*d*f*g*i^2*x*Log[1 + (2*c*E^(h + i*x))/(b
- Sqrt[b^2 - 4*a*c])] - 12*a*Sqrt[-b^2 + 4*a*c]*e*f*g*i^2*x*Log[1 + (2*c*E^
(h + i*x))/(b - Sqrt[b^2 - 4*a*c])] + 3*Sqrt[-(b^2 - 4*a*c)^2]*d*g^2*i^2*x^
2*Log[1 + (2*c*E^(h + i*x))/(b - Sqrt[b^2 - 4*a*c])] + 3*b*Sqrt[-b^2 + 4*a*
c]*d*g^2*i^2*x^2*Log[1 + (2*c*E^(h + i*x))/(b - Sqrt[b^2 - 4*a*c])] - 6*a*S
qrt[-b^2 + 4*a*c]*e*g^2*i^2*x^2*Log[1 + (2*c*E^(h + i*x))/(b - Sqrt[b^2 - 4
*a*c])] + 6*Sqrt[-(b^2 - 4*a*c)^2]*d*f*g*i^2*x*Log[1 + (2*c*E^(h + i*x))/(b
 + Sqrt[b^2 - 4*a*c])] - 6*b*Sqrt[-b^2 + 4*a*c]*d*f*g*i^2*x*Log[1 + (2*c*E^
(h + i*x))/(b + Sqrt[b^2 - 4*a*c])] + 12*a*Sqrt[-b^2 + 4*a*c]*e*f*g*i^2*x*L
og[1 + (2*c*E^(h + i*x))/(b + Sqrt[b^2 - 4*a*c])] + 3*Sqrt[-(b^2 - 4*a*c)^2
]*d*g^2*i^2*x^2*Log[1 + (2*c*E^(h + i*x))/(b + Sqrt[b^2 - 4*a*c])] - 3*b*Sq
rt[-b^2 + 4*a*c]*d*g^2*i^2*x^2*Log[1 + (2*c*E^(h + i*x))/(b + Sqrt[b^2 - 4*
a*c])] + 6*a*Sqrt[-b^2 + 4*a*c]*e*g^2*i^2*x^2*Log[1 + (2*c*E^(h + i*x))/(b
+ Sqrt[b^2 - 4*a*c])] + 3*Sqrt[-(b^2 - 4*a*c)^2]*d*f^2*i^2*Log[a + E^(h + i
*x)*(b + c*E^(h + i*x))] + 6*(Sqrt[-(b^2 - 4*a*c)^2]*d + b*Sqrt[-b^2 + 4*a*
c]*d - 2*a*Sqrt[-b^2 + 4*a*c]*e)*g*i*(f + g*x)*PolyLog[2, (2*c*E^(h + i*x))
/(-b + Sqrt[b^2 - 4*a*c])] + 6*(Sqrt[-(b^2 - 4*a*c)^2]*d - b*Sqrt[-b^2 + 4*
a*c]*d + 2*a*Sqrt[-b^2 + 4*a*c]*e)*g*i*(f + g*x)*PolyLog[2, (-2*c*E^(h + i*
x))/(b + Sqrt[b^2 - 4*a*c])] - 6*Sqrt[-(b^2 - 4*a*c)^2]*d*g^2*PolyLog[3, (2
*c*E^(h + i*x))/(-b + Sqrt[b^2 - 4*a*c])] - 6*b*Sqrt[-b^2 + 4*a*c]*d*g^2*Po
lyLog[3, (2*c*E^(h + i*x))/(-b + Sqrt[b^2 - 4*a*c])] + 12*a*Sqrt[-b^2 + 4*a
*c]*e*g^2*PolyLog[3, (2*c*E^(h + i*x))/(-b + Sqrt[b^2 - 4*a*c])] - 6*Sqrt[-
(b^2 - 4*a*c)^2]*d*g^2*PolyLog[3, (-2*c*E^(h + i*x))/(b + Sqrt[b^2 - 4*a*c]
)] + 6*b*Sqrt[-b^2 + 4*a*c]*d*g^2*PolyLog[3, (-2*c*E^(h + i*x))/(b + Sqrt[b
^2 - 4*a*c])] - 12*a*Sqrt[-b^2 + 4*a*c]*e*g^2*PolyLog[3, (-2*c*E^(h + i*x))
/(b + Sqrt[b^2 - 4*a*c])])/(a*Sqrt[-(b^2 - 4*a*c)^2]*i^3)
```

fricas [C] time = 0.47, size = 1193, normalized size = 1.99

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*exp(i*x+h))*(g*x+f)^2/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h)),x, a
lgorithm="fricas")
```

```
[Out] 1/6*(2*(b^2 - 4*a*c)*d*g^2*i^3*x^3 + 6*(b^2 - 4*a*c)*d*f*g*i^3*x^2 + 6*(b^2
 - 4*a*c)*d*f^2*i^3*x - 6*((b^2 - 4*a*c)*d*g^2*i*x + (b^2 - 4*a*c)*d*f*g*i
+ ((a*b*d - 2*a^2*e)*g^2*i*x + (a*b*d - 2*a^2*e)*f*g*i)*sqrt((b^2 - 4*a*c)/
a^2))*dilog(-1/2*(a*sqrt((b^2 - 4*a*c)/a^2)*e^(i*x + h) + b*e^(i*x + h) + 2
*a)/a + 1) - 6*((b^2 - 4*a*c)*d*g^2*i*x + (b^2 - 4*a*c)*d*f*g*i - ((a*b*d -
```

```
 2*a^2*e)*g^2*i*x + (a*b*d - 2*a^2*e)*f*g*i)*sqrt((b^2 - 4*a*c)/a^2))*dilog
(1/2*(a*sqrt((b^2 - 4*a*c)/a^2)*e^(i*x + h) - b*e^(i*x + h) - 2*a)/a + 1) -
 3*((b^2 - 4*a*c)*d*g^2*h^2 - 2*(b^2 - 4*a*c)*d*f*g*h*i + (b^2 - 4*a*c)*d*f
^2*i^2 - ((a*b*d - 2*a^2*e)*g^2*h^2 - 2*(a*b*d - 2*a^2*e)*f*g*h*i + (a*b*d
- 2*a^2*e)*f^2*i^2)*sqrt((b^2 - 4*a*c)/a^2))*log(2*c*e^(i*x + h) + a*sqrt((
b^2 - 4*a*c)/a^2) + b) - 3*((b^2 - 4*a*c)*d*g^2*h^2 - 2*(b^2 - 4*a*c)*d*f*g
*h*i + (b^2 - 4*a*c)*d*f^2*i^2 + ((a*b*d - 2*a^2*e)*g^2*h^2 - 2*(a*b*d - 2*
a^2*e)*f*g*h*i + (a*b*d - 2*a^2*e)*f^2*i^2)*sqrt((b^2 - 4*a*c)/a^2))*log(2*
c*e^(i*x + h) - a*sqrt((b^2 - 4*a*c)/a^2) + b) - 3*((b^2 - 4*a*c)*d*g^2*i^2
*x^2 + 2*(b^2 - 4*a*c)*d*f*g*i^2*x - (b^2 - 4*a*c)*d*g^2*h^2 + 2*(b^2 - 4*a
*c)*d*f*g*h*i + ((a*b*d - 2*a^2*e)*g^2*i^2*x^2 + 2*(a*b*d - 2*a^2*e)*f*g*i^
2*x - (a*b*d - 2*a^2*e)*g^2*h^2 + 2*(a*b*d - 2*a^2*e)*f*g*h*i)*sqrt((b^2 -
4*a*c)/a^2))*log(1/2*(a*sqrt((b^2 - 4*a*c)/a^2)*e^(i*x + h) + b*e^(i*x + h)
 + 2*a)/a) - 3*((b^2 - 4*a*c)*d*g^2*i^2*x^2 + 2*(b^2 - 4*a*c)*d*f*g*i^2*x -
 (b^2 - 4*a*c)*d*g^2*h^2 + 2*(b^2 - 4*a*c)*d*f*g*h*i - ((a*b*d - 2*a^2*e)*g
^2*i^2*x^2 + 2*(a*b*d - 2*a^2*e)*f*g*i^2*x - (a*b*d - 2*a^2*e)*g^2*h^2 + 2*
(a*b*d - 2*a^2*e)*f*g*h*i)*sqrt((b^2 - 4*a*c)/a^2))*log(-1/2*(a*sqrt((b^2 -
 4*a*c)/a^2)*e^(i*x + h) - b*e^(i*x + h) - 2*a)/a) + 6*((b^2 - 4*a*c)*d*g^2
 + (a*b*d - 2*a^2*e)*g^2*sqrt((b^2 - 4*a*c)/a^2))*polylog(3, -1/2*(a*sqrt((
b^2 - 4*a*c)/a^2)*e^(i*x + h) + b*e^(i*x + h))/a) + 6*((b^2 - 4*a*c)*d*g^2
- (a*b*d - 2*a^2*e)*g^2*sqrt((b^2 - 4*a*c)/a^2))*polylog(3, 1/2*(a*sqrt((b^
2 - 4*a*c)/a^2)*e^(i*x + h) - b*e^(i*x + h))/a))/((a*b^2 - 4*a^2*c)*i^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(gx+f\right)^{2}\left(ee^{(ix+h)}+d\right)}{ce^{(2\,ix+2\,h)}+be^{(ix+h)}+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*exp(i*x+h))*(g*x+f)^2/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h)),x, a
lgorithm="giac")
```

```
[Out] integrate((g*x + f)^2*(e*e^(i*x + h) + d)/(c*e^(2*i*x + 2*h) + b*e^(i*x + h
) + a), x)
```

maple [F] time = 0.41, size = 0, normalized size = 0.00

$$\int \frac{\left(e\,\mathrm{e}^{ix+h}+d\right)\left(gx+f\right)^{2}}{b\,\mathrm{e}^{ix+h}+c\,\mathrm{e}^{2ix+2h}+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*exp(i*x+h)+d)*(g*x+f)^2/(b*exp(i*x+h)+c*exp(2*i*x+2*h)+a),x)
```

```
[Out] int((e*exp(i*x+h)+d)*(g*x+f)^2/(b*exp(i*x+h)+c*exp(2*i*x+2*h)+a),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*exp(i*x+h))*(g*x+f)^2/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h)),x, a
lgorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*a*c-b^2>0)', see `assume?` for mo
re details)Is 4*a*c-b^2 positive or negative?
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(f+g\,x\right)^2\,\left(d+e\,\mathrm{e}^{h+i\,x}\right)}{a+b\,\mathrm{e}^{h+i\,x}+c\,\mathrm{e}^{2\,h+2\,i\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((f + g*x)^2*(d + e*exp(h + i*x)))/(a + b*exp(h + i*x) + c*exp(2*h + 2*
i*x)),x)
```

```
[Out] int(((f + g*x)^2*(d + e*exp(h + i*x)))/(a + b*exp(h + i*x) + c*exp(2*h + 2*
i*x)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d+ee^{h}e^{ix}\right)\left(f+gx\right)^{2}}{a+be^{h}e^{ix}+ce^{2h}e^{2ix}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*exp(i*x+h))*(g*x+f)**2/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h)),x)
```

```
[Out] Integral((d + e*exp(h)*exp(i*x))*(f + g*x)**2/(a + b*exp(h)*exp(i*x) + c*ex
p(2*h)*exp(2*i*x)), x)
```

3.574 $\int \frac{\left(d+ee^{h+ix}\right)(f+gx)}{a+be^{h+ix}+ce^{2h+2ix}}\,dx$

Optimal. Leaf size=428

$$-\frac{(f+gx)\left(\frac{2cd-be}{\sqrt{b^2-4ac}}+e\right)\log\left(\frac{2ce^{h+ix}}{b-\sqrt{b^2-4ac}}+1\right)}{i\left(b-\sqrt{b^2-4ac}\right)}-\frac{(f+gx)\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)\log\left(\frac{2ce^{h+ix}}{\sqrt{b^2-4ac}+b}+1\right)}{i\left(\sqrt{b^2-4ac}+b\right)}+\frac{(f+gx)^2\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right.}{2g\left(\sqrt{b^2-4ac}+b\right)}$$

```
[Out] 1/2*(g*x+f)^2*(e+(-b*e+2*c*d)/(-4*a*c+b^2)^(1/2))/g/(b-(-4*a*c+b^2)^(1/2))-
(g*x+f)*ln(1+2*c*exp(i*x+h)/(b-(-4*a*c+b^2)^(1/2)))*(e+(-b*e+2*c*d)/(-4*a*c
+b^2)^(1/2))/i/(b-(-4*a*c+b^2)^(1/2))-g*polylog(2,-2*c*exp(i*x+h)/(b-(-4*a*
c+b^2)^(1/2)))*(e+(-b*e+2*c*d)/(-4*a*c+b^2)^(1/2))/i^2/(b-(-4*a*c+b^2)^(1/2
))+1/2*(g*x+f)^2*(e+(b*e-2*c*d)/(-4*a*c+b^2)^(1/2))/g/(b+(-4*a*c+b^2)^(1/2)
)-(g*x+f)*ln(1+2*c*exp(i*x+h)/(b+(-4*a*c+b^2)^(1/2)))*(e+(b*e-2*c*d)/(-4*a*
c+b^2)^(1/2))/i/(b+(-4*a*c+b^2)^(1/2))-g*polylog(2,-2*c*exp(i*x+h)/(b+(-4*a
*c+b^2)^(1/2)))*(e+(b*e-2*c*d)/(-4*a*c+b^2)^(1/2))/i^2/(b+(-4*a*c+b^2)^(1/2
))
```

Rubi [A] time = 0.58, antiderivative size = 428, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 5, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.119, Rules used = {2265, 2184, 2190, 2279, 2391}

$$-\frac{g\left(\frac{2cd-be}{\sqrt{b^2-4ac}}+e\right)\text{PolyLog}\left(2,-\frac{2ce^{h+ix}}{b-\sqrt{b^2-4ac}}\right)}{i^2\left(b-\sqrt{b^2-4ac}\right)}-\frac{g\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)\text{PolyLog}\left(2,-\frac{2ce^{h+ix}}{\sqrt{b^2-4ac}+b}\right)}{i^2\left(\sqrt{b^2-4ac}+b\right)}-\frac{(f+gx)\left(\frac{2cd-be}{\sqrt{b^2-4ac}}+e\right)\text{lo}}{i\left(b-\sqrt{b^2-\right.}}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*E^(h + i*x))*(f + g*x))/(a + b*E^(h + i*x) + c*E^(2*h + 2*i*x))
,x]
```

```
[Out] ((e - (2*c*d - b*e)/Sqrt[b^2 - 4*a*c])*(f + g*x)^2)/(2*(b + Sqrt[b^2 - 4*a*
c])*g) + ((e + (2*c*d - b*e)/Sqrt[b^2 - 4*a*c])*(f + g*x)^2)/(2*(b - Sqrt[b
^2 - 4*a*c])*g) - ((e + (2*c*d - b*e)/Sqrt[b^2 - 4*a*c])*(f + g*x)*Log[1 +
(2*c*E^(h + i*x))/(b - Sqrt[b^2 - 4*a*c])])/((b - Sqrt[b^2 - 4*a*c])*i) - (
(e - (2*c*d - b*e)/Sqrt[b^2 - 4*a*c])*(f + g*x)*Log[1 + (2*c*E^(h + i*x))/(
b + Sqrt[b^2 - 4*a*c])])/((b + Sqrt[b^2 - 4*a*c])*i) - ((e + (2*c*d - b*e)/
Sqrt[b^2 - 4*a*c])*g*PolyLog[2, (-2*c*E^(h + i*x))/(b - Sqrt[b^2 - 4*a*c])]
)/((b - Sqrt[b^2 - 4*a*c])*i^2) - ((e - (2*c*d - b*e)/Sqrt[b^2 - 4*a*c])*g*
PolyLog[2, (-2*c*E^(h + i*x))/(b + Sqrt[b^2 - 4*a*c])])/((b + Sqrt[b^2 - 4*
a*c])*i^2)
```

Rule 2184

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[((c + d*x)^m*(F^(g*(e + f*x)))^n)/(a + b*(F^(g*(e + f*x)))^n), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2265

```
Int[(((i_.)*(F_)^(u_) + (h_))*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F
_)^(u_) + (c_.)*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dis
t[Simplify[(2*c*h - b*i)/q] + i, Int[(f + g*x)^m/(b - q + 2*c*F^u), x], x]
- Dist[Simplify[(2*c*h - b*i)/q] - i, Int[(f + g*x)^m/(b + q + 2*c*F^u), x]
, x]] /; FreeQ[{F, a, b, c, f, g, h, i}, x] && EqQ[v, 2*u] && LinearQ[u, x]
 && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\left(d+ee^{h+574x}\right)(f+gx)}{a+be^{h+574x}+ce^{2h+1148x}}\,dx = -\left(\left(-e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)\int \frac{f+gx}{b+\sqrt{b^2-4ac}+2ce^{h+574x}}\,dx\right)+\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)\int$$

$$= \frac{\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^2}{2\left(b+\sqrt{b^2-4ac}\right)g}+\frac{\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^2}{2\left(b-\sqrt{b^2-4ac}\right)g}-\frac{\left(2c\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)\right)\int \frac{}{b+\sqrt{}}}{b+\sqrt{b^2-}}$$

$$= \frac{\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^2}{2\left(b+\sqrt{b^2-4ac}\right)g}+\frac{\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^2}{2\left(b-\sqrt{b^2-4ac}\right)g}-\frac{\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)\,\mathrm{lo}}{574\left(b-\sqrt{b^2}\right.}$$

$$= \frac{\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^2}{2\left(b+\sqrt{b^2-4ac}\right)g}+\frac{\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^2}{2\left(b-\sqrt{b^2-4ac}\right)g}-\frac{\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)\,\mathrm{lo}}{574\left(b-\sqrt{b^2}\right.}$$

$$= \frac{\left(e-\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^2}{2\left(b+\sqrt{b^2-4ac}\right)g}+\frac{\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)^2}{2\left(b-\sqrt{b^2-4ac}\right)g}-\frac{\left(e+\frac{2cd-be}{\sqrt{b^2-4ac}}\right)(f+gx)\,\mathrm{lo}}{574\left(b-\sqrt{b^2}\right.}$$

Mathematica [A] time = 1.75, size = 677, normalized size = 1.58

$$-\frac{i\left(df\sqrt{-\left(b^2-4ac\right)^2}\,\log\left(a+e^{h+ix}\left(b+ce^{h+ix}\right)\right)+2bdf\sqrt{b^2-4ac}\,\tan^{-1}\left(\frac{b+2ce^{h+ix}}{\sqrt{4ac-b^2}}\right)-2dfix\sqrt{-\left(b^2-4ac\right)^2}+\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*E^(h + i*x))*(f + g*x))/(a + b*E^(h + i*x) + c*E^(2*h + 2
*i*x)),x]
```

```
[Out] -1/2*(i*(-2*Sqrt[-(b^2 - 4*a*c)^2]*d*f*i*x - Sqrt[-(b^2 - 4*a*c)^2]*d*g*i*x
^2 + 2*b*Sqrt[b^2 - 4*a*c]*d*f*ArcTan[(b + 2*c*E^(h + i*x))/Sqrt[-b^2 + 4*a
*c]] + 4*a*Sqrt[-b^2 + 4*a*c]*e*f*ArcTanh[(b + 2*c*E^(h + i*x))/Sqrt[b^2 -
4*a*c]] + Sqrt[-(b^2 - 4*a*c)^2]*d*g*x*Log[1 + (2*c*E^(h + i*x))/(b - Sqrt[
b^2 - 4*a*c])] + b*Sqrt[-b^2 + 4*a*c]*d*g*x*Log[1 + (2*c*E^(h + i*x))/(b -
Sqrt[b^2 - 4*a*c])] - 2*a*Sqrt[-b^2 + 4*a*c]*e*g*x*Log[1 + (2*c*E^(h + i*x)
)/(b - Sqrt[b^2 - 4*a*c])] + Sqrt[-(b^2 - 4*a*c)^2]*d*g*x*Log[1 + (2*c*E^(h
 + i*x))/(b + Sqrt[b^2 - 4*a*c])] - b*Sqrt[-b^2 + 4*a*c]*d*g*x*Log[1 + (2*c
*E^(h + i*x))/(b + Sqrt[b^2 - 4*a*c])] + 2*a*Sqrt[-b^2 + 4*a*c]*e*g*x*Log[1
 + (2*c*E^(h + i*x))/(b + Sqrt[b^2 - 4*a*c])] + Sqrt[-(b^2 - 4*a*c)^2]*d*f*
```

```
Log[a + E^(h + i*x)*(b + c*E^(h + i*x))]) + (Sqrt[-(b^2 - 4*a*c)^2]*d + b*S
qrt[-b^2 + 4*a*c]*d - 2*a*Sqrt[-b^2 + 4*a*c]*e)*g*PolyLog[2, (2*c*E^(h + i*
x))/(-b + Sqrt[b^2 - 4*a*c])] + (Sqrt[-(b^2 - 4*a*c)^2]*d - b*Sqrt[-b^2 + 4
*a*c]*d + 2*a*Sqrt[-b^2 + 4*a*c]*e)*g*PolyLog[2, (-2*c*E^(h + i*x))/(b + Sq
rt[b^2 - 4*a*c])])/(a*Sqrt[-(b^2 - 4*a*c)^2]*i^2)
```

fricas [A] time = 0.45, size = 651, normalized size = 1.52

$$\frac{\left(b^2-4\,ac\right)dgi^2x^2+2\left(b^2-4\,ac\right)dfi^2x-\left(\left(b^2-4\,ac\right)dg+\left(abd-2\,a^2e\right)g\sqrt{\frac{b^2-4\,ac}{a^2}}\right)\mathrm{Li}_2\left(-\frac{a\sqrt{\frac{b^2-4\,ac}{a^2}}\,e^{(ix+h)}+be^{(ix+h)}+2\,a}{2\,a}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*exp(i*x+h))*(g*x+f)/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h)),x, alg
orithm="fricas")
```

```
[Out] 1/2*((b^2 - 4*a*c)*d*g*i^2*x^2 + 2*(b^2 - 4*a*c)*d*f*i^2*x - ((b^2 - 4*a*c)
*d*g + (a*b*d - 2*a^2*e)*g*sqrt((b^2 - 4*a*c)/a^2))*dilog(-1/2*(a*sqrt((b^2
 - 4*a*c)/a^2)*e^(i*x + h) + b*e^(i*x + h) + 2*a)/a + 1) - ((b^2 - 4*a*c)*d
*g - (a*b*d - 2*a^2*e)*g*sqrt((b^2 - 4*a*c)/a^2))*dilog(1/2*(a*sqrt((b^2 -
4*a*c)/a^2)*e^(i*x + h) - b*e^(i*x + h) - 2*a)/a + 1) + ((b^2 - 4*a*c)*d*g*
h - (b^2 - 4*a*c)*d*f*i - ((a*b*d - 2*a^2*e)*g*h - (a*b*d - 2*a^2*e)*f*i)*s
qrt((b^2 - 4*a*c)/a^2))*log(2*c*e^(i*x + h) + a*sqrt((b^2 - 4*a*c)/a^2) + b
) + ((b^2 - 4*a*c)*d*g*h - (b^2 - 4*a*c)*d*f*i + ((a*b*d - 2*a^2*e)*g*h - (
a*b*d - 2*a^2*e)*f*i)*sqrt((b^2 - 4*a*c)/a^2))*log(2*c*e^(i*x + h) - a*sqrt
((b^2 - 4*a*c)/a^2) + b) - ((b^2 - 4*a*c)*d*g*i*x + (b^2 - 4*a*c)*d*g*h + (
(a*b*d - 2*a^2*e)*g*i*x + (a*b*d - 2*a^2*e)*g*h)*sqrt((b^2 - 4*a*c)/a^2))*l
og(1/2*(a*sqrt((b^2 - 4*a*c)/a^2)*e^(i*x + h) + b*e^(i*x + h) + 2*a)/a) - (
(b^2 - 4*a*c)*d*g*i*x + (b^2 - 4*a*c)*d*g*h - ((a*b*d - 2*a^2*e)*g*i*x + (a
*b*d - 2*a^2*e)*g*h)*sqrt((b^2 - 4*a*c)/a^2))*log(-1/2*(a*sqrt((b^2 - 4*a*c
)/a^2)*e^(i*x + h) - b*e^(i*x + h) - 2*a)/a))/((a*b^2 - 4*a^2*c)*i^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(gx+f\right)\left(ee^{(ix+h)}+d\right)}{ce^{(2\,ix+2\,h)}+be^{(ix+h)}+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*exp(i*x+h))*(g*x+f)/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h)),x, alg
orithm="giac")
```

```
[Out] integrate((g*x + f)*(e*e^(i*x + h) + d)/(c*e^(2*i*x + 2*h) + b*e^(i*x + h)
+ a), x)
```

maple [B] time = 0.05, size = 1249, normalized size = 2.92

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*exp(i*x+h)+d)*(g*x+f)/(b*exp(i*x+h)+c*exp(2*i*x+2*h)+a),x)
```

```
[Out] -1/2*d*f/i/a*ln(a+b*exp(i*x)*exp(h)+c*exp(i*x)^2*exp(2*h))-d*f/i/a*exp(h)*b
/(4*a*c*exp(2*h)-exp(h)^2*b^2)^(1/2)*arctan((exp(h)*b+2*exp(2*h)*exp(i*x)*c
)/(4*a*c*exp(2*h)-exp(h)^2*b^2)^(1/2))+d*f/i/a*ln(exp(i*x))-1/2*d*g/i/a*x/(
exp(h)^2*b^2-4*a*c*exp(2*h))^(1/2)*ln((-2*exp(2*h)*exp(i*x)*c-exp(h)*b+(exp
(h)^2*b^2-4*a*c*exp(2*h))^(1/2))/(-exp(h)*b+(exp(h)^2*b^2-4*a*c*exp(2*h))^(
1/2)))*exp(h)*b+1/2*d*g/i/a*x/(exp(h)^2*b^2-4*a*c*exp(2*h))^(1/2)*ln((2*exp
(2*h)*exp(i*x)*c+exp(h)*b+(exp(h)^2*b^2-4*a*c*exp(2*h))^(1/2))/(exp(h)*b+(e
xp(h)^2*b^2-4*a*c*exp(2*h))^(1/2)))*exp(h)*b-1/2*d*g/i/a*x*ln((-2*exp(2*h)*
exp(i*x)*c-exp(h)*b+(exp(h)^2*b^2-4*a*c*exp(2*h))^(1/2))/(-exp(h)*b+(exp(h)
^2*b^2-4*a*c*exp(2*h))^(1/2)))-1/2*d*g/i/a*x*ln((2*exp(2*h)*exp(i*x)*c+exp(
h)*b+(exp(h)^2*b^2-4*a*c*exp(2*h))^(1/2))/(exp(h)*b+(exp(h)^2*b^2-4*a*c*exp
(2*h))^(1/2)))-1/2*d*g/i^2/a/(exp(h)^2*b^2-4*a*c*exp(2*h))^(1/2)*dilog((-2*
exp(2*h)*exp(i*x)*c-exp(h)*b+(exp(h)^2*b^2-4*a*c*exp(2*h))^(1/2))/(-exp(h)*
b+(exp(h)^2*b^2-4*a*c*exp(2*h))^(1/2)))*exp(h)*b+1/2*d*g/i^2/a/(exp(h)^2*b^
2-4*a*c*exp(2*h))^(1/2)*dilog((2*exp(2*h)*exp(i*x)*c+exp(h)*b+(exp(h)^2*b^2
-4*a*c*exp(2*h))^(1/2))/(exp(h)*b+(exp(h)^2*b^2-4*a*c*exp(2*h))^(1/2)))*exp
(h)*b-1/2*d*g/i^2/a*dilog((-2*exp(2*h)*exp(i*x)*c-exp(h)*b+(exp(h)^2*b^2-4*
a*c*exp(2*h))^(1/2))/(-exp(h)*b+(exp(h)^2*b^2-4*a*c*exp(2*h))^(1/2)))-1/2*d
*g/i^2/a*dilog((2*exp(2*h)*exp(i*x)*c+exp(h)*b+(exp(h)^2*b^2-4*a*c*exp(2*h)
)^(1/2))/(exp(h)*b+(exp(h)^2*b^2-4*a*c*exp(2*h))^(1/2)))+1/2*d*g*x^2/a+2*e*
exp(h)*f/i/(4*a*c*exp(2*h)-exp(h)^2*b^2)^(1/2)*arctan((exp(h)*b+2*exp(2*h)*
exp(i*x)*c)/(4*a*c*exp(2*h)-exp(h)^2*b^2)^(1/2))+e*exp(h)*g/i*x/(exp(h)^2*b
^2-4*a*c*exp(2*h))^(1/2)*ln((-2*exp(2*h)*exp(i*x)*c-exp(h)*b+(exp(h)^2*b^2-
4*a*c*exp(2*h))^(1/2))/(-exp(h)*b+(exp(h)^2*b^2-4*a*c*exp(2*h))^(1/2)))-e*e
xp(h)*g/i*x/(exp(h)^2*b^2-4*a*c*exp(2*h))^(1/2)*ln((2*exp(2*h)*exp(i*x)*c+e
xp(h)*b+(exp(h)^2*b^2-4*a*c*exp(2*h))^(1/2))/(exp(h)*b+(exp(h)^2*b^2-4*a*c*
exp(2*h))^(1/2)))+e*exp(h)*g/i^2/(exp(h)^2*b^2-4*a*c*exp(2*h))^(1/2)*dilog(
(-2*exp(2*h)*exp(i*x)*c-exp(h)*b+(exp(h)^2*b^2-4*a*c*exp(2*h))^(1/2))/(-exp
(h)*b+(exp(h)^2*b^2-4*a*c*exp(2*h))^(1/2)))-e*exp(h)*g/i^2/(exp(h)^2*b^2-4*
a*c*exp(2*h))^(1/2)*dilog((2*exp(2*h)*exp(i*x)*c+exp(h)*b+(exp(h)^2*b^2-4*a
*c*exp(2*h))^(1/2))/(exp(h)*b+(exp(h)^2*b^2-4*a*c*exp(2*h))^(1/2)))
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*exp(i*x+h))*(g*x+f)/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h)),x, alg
orithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*a*c-b^2>0)', see `assume?` for mo
re details)Is 4*a*c-b^2 positive or negative?
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(f+g\,x\right)\,\left(d+e\,\mathrm{e}^{h+i\,x}\right)}{a+b\,\mathrm{e}^{h+i\,x}+c\,\mathrm{e}^{2\,h+2\,i\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((f + g*x)*(d + e*exp(h + i*x)))/(a + b*exp(h + i*x) + c*exp(2*h + 2*i*
x)),x)
```

```
[Out] int(((f + g*x)*(d + e*exp(h + i*x)))/(a + b*exp(h + i*x) + c*exp(2*h + 2*i*
x)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d+ee^{h}e^{ix}\right)\left(f+gx\right)}{a+be^{h}e^{ix}+ce^{2h}e^{2ix}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*exp(i*x+h))*(g*x+f)/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h)),x)
```

```
[Out] Integral((d + e*exp(h)*exp(i*x))*(f + g*x)/(a + b*exp(h)*exp(i*x) + c*exp(2
*h)*exp(2*i*x)), x)
```

3.575 $\int \frac{d+ee^{h+ix}}{a+be^{h+ix}+ce^{2h+2ix}}\,dx$

Optimal. Leaf size=95

$$\frac{(bd-2ae)\tanh^{-1}\left(\frac{b+2ce^{h+ix}}{\sqrt{b^2-4ac}}\right)}{ai\sqrt{b^2-4ac}}-\frac{d\log\left(a+be^{h+ix}+ce^{2h+2ix}\right)}{2ai}+\frac{dx}{a}$$

```
[Out] d*x/a-1/2*d*ln(a+b*exp(i*x+h)+c*exp(2*i*x+2*h))/a/i+(-2*a*e+b*d)*arctanh((b
+2*c*exp(i*x+h))/(-4*a*c+b^2)^(1/2))/a/i/(-4*a*c+b^2)^(1/2)
```

Rubi [A] time = 0.15, antiderivative size = 95, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.162, Rules used = {2282, 800, 634, 618, 206, 628}

$$\frac{(bd-2ae)\tanh^{-1}\left(\frac{b+2ce^{h+ix}}{\sqrt{b^2-4ac}}\right)}{ai\sqrt{b^2-4ac}}-\frac{d\log\left(a+be^{h+ix}+ce^{2h+2ix}\right)}{2ai}+\frac{dx}{a}$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*E^(h + i*x))/(a + b*E^(h + i*x) + c*E^(2*h + 2*i*x)),x]
```

```
[Out] (d*x)/a + ((b*d - 2*a*e)*ArcTanh[(b + 2*c*E^(h + i*x))/Sqrt[b^2 - 4*a*c]])/
(a*Sqrt[b^2 - 4*a*c]*i) - (d*Log[a + b*E^(h + i*x) + c*E^(2*h + 2*i*x)])/(2
*a*i)
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 618

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> Dist[-2, Subst[I
nt[1/Simp[b^2 - 4*a*c - x^2, x], x], x, b + 2*c*x], x] /; FreeQ[{a, b, c},
x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 634

```
Int[((d_.) + (e_.)*(x_))/((a_) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> D
ist[(2*c*d - b*e)/(2*c), Int[1/(a + b*x + c*x^2), x], x] + Dist[e/(2*c), In
t[(b + 2*c*x)/(a + b*x + c*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && NeQ
[2*c*d - b*e, 0] && NeQ[b^2 - 4*a*c, 0] &&  !NiceSqrtQ[b^2 - 4*a*c]
```

Rule 800

```
Int[(((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_)))/((a_.) + (b_.)*(x_) +
(c_.)*(x_)^2), x_Symbol] :> Int[ExpandIntegrand[((d + e*x)^m*(f + g*x))/(a
+ b*x + c*x^2), x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[b^2 - 4*a*
c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegerQ[m]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}
\int \frac{d+ee^{h+575x}}{a+be^{h+575x}+ce^{2h+1150x}}\,dx &= \frac{1}{575}\operatorname{Subst}\left(\int \frac{d+ex}{x\left(a+bx+cx^2\right)}\,dx,x,e^{h+575x}\right)\\
&= \frac{1}{575}\operatorname{Subst}\left(\int \left(\frac{d}{ax}+\frac{-bd+ae-cdx}{a\left(a+bx+cx^2\right)}\right)dx,x,e^{h+575x}\right)\\
&= \frac{dx}{a}+\frac{\operatorname{Subst}\left(\int \frac{-bd+ae-cdx}{a+bx+cx^2}\,dx,x,e^{h+575x}\right)}{575a}\\
&= \frac{dx}{a}-\frac{d\operatorname{Subst}\left(\int \frac{b+2cx}{a+bx+cx^2}\,dx,x,e^{h+575x}\right)}{1150a}-\frac{(bd-2ae)\operatorname{Subst}\left(\int \frac{1}{a+bx+cx^2}\,dx,x,e^{h\cdots}\right.}{1150a}\\
&= \frac{dx}{a}-\frac{d\log\left(a+be^{h+575x}+ce^{2h+1150x}\right)}{1150a}+\frac{(bd-2ae)\operatorname{Subst}\left(\int \frac{1}{b^2-4ac-x^2}\,dx,x,b+\cdots\right.}{575a}\\
&= \frac{dx}{a}+\frac{(bd-2ae)\tanh^{-1}\left(\frac{b+2ce^{h+575x}}{\sqrt{b^2-4ac}}\right)}{575a\sqrt{b^2-4ac}}-\frac{d\log\left(a+be^{h+575x}+ce^{2h+1150x}\right)}{1150a}
\end{aligned}$$

Mathematica [A] time = 0.17, size = 94, normalized size = 0.99

$$-\frac{\frac{2(bd-2ae)\tan^{-1}\left(\frac{b+2ce^{h+ix}}{\sqrt{4ac-b^2}}\right)}{i\sqrt{4ac-b^2}}+\frac{d\log\left(a+e^{h+ix}\left(b+ce^{h+ix}\right)\right)}{i}-2dx}{2a}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*E^(h + i*x))/(a + b*E^(h + i*x) + c*E^(2*h + 2*i*x)),x]
```

```
[Out] -1/2*(-2*d*x + (2*(b*d - 2*a*e)*ArcTan[(b + 2*c*E^(h + i*x))/Sqrt[-b^2 + 4*
a*c]])/(Sqrt[-b^2 + 4*a*c]*i) + (d*Log[a + E^(h + i*x)*(b + c*E^(h + i*x))]
)/i)/a
```

fricas [A] time = 0.45, size = 291, normalized size = 3.06

$$\left[\frac{2\left(b^2-4ac\right)dix-\left(b^2-4ac\right)d\log\left(ce^{(2ix+2h)}+be^{(ix+h)}+a\right)-\sqrt{b^2-4ac}\,(bd-2ae)\log\left(\frac{2c^2e^{(2ix+2h)}+2bce^{(ix+h)}+b^2}{ce^{(2ix+2h)}}\right.}{2\left(ab^2-4a^2c\right)i}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*exp(i*x+h))/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h)),x, algorithm="
fricas")
```

```
[Out] [1/2*(2*(b^2 - 4*a*c)*d*i*x - (b^2 - 4*a*c)*d*log(c*e^(2*i*x + 2*h) + b*e^(
i*x + h) + a) - sqrt(b^2 - 4*a*c)*(b*d - 2*a*e)*log((2*c^2*e^(2*i*x + 2*h)
+ 2*b*c*e^(i*x + h) + b^2 - 2*a*c - sqrt(b^2 - 4*a*c)*(2*c*e^(i*x + h) + b)
)/(c*e^(2*i*x + 2*h) + b*e^(i*x + h) + a)))/((a*b^2 - 4*a^2*c)*i), 1/2*(2*(
b^2 - 4*a*c)*d*i*x - (b^2 - 4*a*c)*d*log(c*e^(2*i*x + 2*h) + b*e^(i*x + h)
+ a) + 2*sqrt(-b^2 + 4*a*c)*(b*d - 2*a*e)*arctan(-sqrt(-b^2 + 4*a*c)*(2*c*e
^(i*x + h) + b)/(b^2 - 4*a*c)))/((a*b^2 - 4*a^2*c)*i)]
```

giac [A] time = 0.26, size = 127, normalized size = 1.34

$$\frac{1}{2}\left(\frac{2\left(bde^{(3h)}-2ae^{(3h+1)}\right)\arctan\left(\frac{\left(2ce^{(ix+4h)}+be^{(3h)}\right)e^{(-3h)}}{\sqrt{-b^2+4ac}}\right)e^{(-3h)}}{\sqrt{-b^2+4ac}\,a}+\frac{d\log\left(ce^{(2ix+8h)}+be^{(ix+7h)}+ae^{(6h)}\right)}{a}-\frac{2d\log}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*exp(i*x+h))/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h)),x, algorithm="
giac")
```

```
[Out] 1/2*(2*(b*d*e^(3*h) - 2*a*e^(3*h + 1))*arctan((2*c*e^(i*x + 4*h) + b*e^(3*h
))*e^(-3*h)/sqrt(-b^2 + 4*a*c))*e^(-3*h)/(sqrt(-b^2 + 4*a*c)*a) + d*log(c*e
^(2*i*x + 8*h) + b*e^(i*x + 7*h) + a*e^(6*h))/a - 2*d*log(e^(i*x + 4*h))/a)
*i
```

maple [B] time = 0.02, size = 183, normalized size = 1.93

$$-\frac{bd\arctan\left(\frac{2c\,\mathrm{e}^{ix}\mathrm{e}^{2h}+b\,\mathrm{e}^{h}}{\sqrt{4ac\,\mathrm{e}^{2h}-b^{2}\mathrm{e}^{2h}}}\right)\mathrm{e}^{h}}{\sqrt{4ac\,\mathrm{e}^{2h}-b^{2}\mathrm{e}^{2h}}\;ai}+\frac{2e\arctan\left(\frac{2c\,\mathrm{e}^{ix}\mathrm{e}^{2h}+b\,\mathrm{e}^{h}}{\sqrt{4ac\,\mathrm{e}^{2h}-b^{2}\mathrm{e}^{2h}}}\right)\mathrm{e}^{h}}{\sqrt{4ac\,\mathrm{e}^{2h}-b^{2}\mathrm{e}^{2h}}\;i}-\frac{d\ln\left(b\,\mathrm{e}^{h}\mathrm{e}^{ix}+c\,\mathrm{e}^{2h}\mathrm{e}^{2ix}+a\right)}{2ai}+\frac{d\ln\left(\mathrm{e}^{ix}\right)}{ai}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*exp(i*x+h)+d)/(b*exp(i*x+h)+c*exp(2*i*x+2*h)+a),x)
```

```
[Out] -1/2*d/i/a*ln(a+b*exp(h)*exp(i*x)+c*exp(i*x)^2*exp(2*h))-d/i/a*exp(h)*b/(4*
a*c*exp(2*h)-exp(h)^2*b^2)^(1/2)*arctan((2*c*exp(i*x)*exp(2*h)+b*exp(h))/(4
*a*c*exp(2*h)-exp(h)^2*b^2)^(1/2))+d/i/a*ln(exp(i*x))+2*e*exp(h)/i/(4*a*c*e
xp(2*h)-exp(h)^2*b^2)^(1/2)*arctan((2*c*exp(i*x)*exp(2*h)+b*exp(h))/(4*a*c*
exp(2*h)-exp(h)^2*b^2)^(1/2))
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*exp(i*x+h))/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h)),x, algorithm="
maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*a*c-b^2>0)', see `assume?` for mo
re details)Is 4*a*c-b^2 positive or negative?
```

mupad [B] time = 3.78, size = 91, normalized size = 0.96

$$\frac{d\,x}{a}-\frac{d\,\ln\left(a+b\,\mathrm{e}^{i\,x}\,\mathrm{e}^{h}+c\,\mathrm{e}^{2\,h}\,\mathrm{e}^{2\,i\,x}\right)}{2\,a\,i}+\frac{\mathrm{atan}\left(\frac{b+2\,c\,\mathrm{e}^{i\,x}\,\mathrm{e}^{h}}{\sqrt{4\,a\,c-b^2}}\right)\,\left(2\,a\,e-b\,d\right)}{a\,i\,\sqrt{4\,a\,c-b^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d + e*exp(h + i*x))/(a + b*exp(h + i*x) + c*exp(2*h + 2*i*x)),x)
```

```
[Out] (d*x)/a - (d*log(a + b*exp(i*x)*exp(h) + c*exp(2*h)*exp(2*i*x)))/(2*a*i) +
(atan((b + 2*c*exp(i*x)*exp(h))/(4*a*c - b^2)^(1/2))*(2*a*e - b*d))/(a*i*(4
*a*c - b^2)^(1/2))
```

sympy [A] time = 1.03, size = 116, normalized size = 1.22

$$\operatorname{RootSum}\left(z^{2}\left(4a^{2}ci^{2}-ab^{2}i^{2}\right)+z\left(4acdi-b^{2}di\right)+ae^{2}-bde+cd^{2},\left(i\mapsto i\log\left(e^{h+ix}+\frac{4ia^{2}ci-iab^{2}i+abe+2a}{2ace-bcd}\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*exp(i*x+h))/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h)),x)
```

```
[Out] RootSum(_z**2*(4*a**2*c*i**2 - a*b**2*i**2) + _z*(4*a*c*d*i - b**2*d*i) + a
*e**2 - b*d*e + c*d**2, Lambda(_i, _i*log(exp(h + i*x) + (4*_i*a**2*c*i - _
i*a*b**2*i + a*b*e + 2*a*c*d - b**2*d)/(2*a*c*e - b*c*d)))) + d*x/a
```

3.576 $\int \frac{d+ee^{h+ix}}{(a+be^{h+ix}+ce^{2h+2ix})(f+gx)}\,dx$

Optimal. Leaf size=84

$$d\text{Int}\left(\frac{1}{(f+gx)\left(a+be^{h+ix}+ce^{2h+2ix}\right)},x\right)+e\text{Int}\left(\frac{e^{h+ix}}{(f+gx)\left(a+be^{h+ix}+ce^{2h+2ix}\right)},x\right)$$

```
[Out] d*CannotIntegrate(1/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h))/(g*x+f),x)+e*CannotIn
tegrate(exp(i*x+h)/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h))/(g*x+f),x)
```

Rubi [A] time = 1.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{d+ee^{h+ix}}{\left(a+be^{h+ix}+ce^{2h+2ix}\right)(f+gx)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(d + e*E^(h + i*x))/((a + b*E^(h + i*x) + c*E^(2*h + 2*i*x))*(f + g*x))
,x]
```

```
[Out] d*Defer[Int][1/((a + b*E^(h + i*x) + c*E^(2*h + 2*i*x))*(f + g*x)), x] + e*
Defer[Int][E^(h + i*x)/((a + b*E^(h + i*x) + c*E^(2*h + 2*i*x))*(f + g*x)),
 x]
```

Rubi steps

$$\int \frac{d+ee^{h+576x}}{\left(a+be^{h+576x}+ce^{2h+1152x}\right)(f+gx)}\,dx=\int \left(\frac{d}{\left(a+be^{h+576x}+ce^{2h+1152x}\right)(f+gx)}+\frac{ee^{h+576x}}{\left(a+be^{h+576x}+ce^{2h+1152x}\right.}\right.$$

$$=d\int \frac{1}{\left(a+be^{h+576x}+ce^{2h+1152x}\right)(f+gx)}\,dx+e\int \frac{e^{h+5}}{\left(a+be^{h+576x}+ce\right.}$$

Mathematica [A] time = 0.44, size = 0, normalized size = 0.00

$$\int \frac{d+ee^{h+ix}}{\left(a+be^{h+ix}+ce^{2h+2ix}\right)(f+gx)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(d + e*E^(h + i*x))/((a + b*E^(h + i*x) + c*E^(2*h + 2*i*x))*(f +
 g*x)),x]
```

```
[Out] Integrate[(d + e*E^(h + i*x))/((a + b*E^(h + i*x) + c*E^(2*h + 2*i*x))*(f +
 g*x)), x]
```

fricas [A] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{ee^{(ix+h)}+d}{agx+af+\left(cgx+cf\right)e^{(2\,ix+2\,h)}+\left(bgx+bf\right)e^{(ix+h)}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*exp(i*x+h))/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h))/(g*x+f),x, alg
orithm="fricas")
```

```
[Out] integral((e*e^(i*x + h) + d)/(a*g*x + a*f + (c*g*x + c*f)*e^(2*i*x + 2*h) +
 (b*g*x + b*f)*e^(i*x + h)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{ee^{(ix+h)}+d}{\left(gx+f\right)\left(ce^{(2\,ix+2\,h)}+be^{(ix+h)}+a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*exp(i*x+h))/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h))/(g*x+f),x, alg
orithm="giac")
```

```
[Out] integrate((e*e^(i*x + h) + d)/((g*x + f)*(c*e^(2*i*x + 2*h) + b*e^(i*x + h)
 + a)), x)
```

maple [A] time = 0.24, size = 0, normalized size = 0.00

$$\int \frac{e\,{\mathrm e}^{ix+h}+d}{\left(b\,{\mathrm e}^{ix+h}+c\,{\mathrm e}^{2ix+2h}+a\right)\left(gx+f\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*exp(i*x+h)+d)/(b*exp(i*x+h)+c*exp(2*i*x+2*h)+a)/(g*x+f),x)
```

```
[Out] int((e*exp(i*x+h)+d)/(b*exp(i*x+h)+c*exp(2*i*x+2*h)+a)/(g*x+f),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{ee^{(ix+h)}+d}{\left(gx+f\right)\left(ce^{(2\,ix+2\,h)}+be^{(ix+h)}+a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*exp(i*x+h))/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h))/(g*x+f),x, alg
orithm="maxima")
```

```
[Out] integrate((e*e^(i*x + h) + d)/((g*x + f)*(c*e^(2*i*x + 2*h) + b*e^(i*x + h)
 + a)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{d+e\,\mathrm{e}^{h+i\,x}}{\left(f+g\,x\right)\,\left(a+b\,\mathrm{e}^{h+i\,x}+c\,\mathrm{e}^{2\,h+2\,i\,x}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d + e*exp(h + i*x))/((f + g*x)*(a + b*exp(h + i*x) + c*exp(2*h + 2*i*x
))),x)
```

```
[Out] int((d + e*exp(h + i*x))/((f + g*x)*(a + b*exp(h + i*x) + c*exp(2*h + 2*i*x
))), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{d+ee^{h}e^{ix}}{\left(f+gx\right)\left(a+be^{h}e^{ix}+ce^{2h}e^{2ix}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*exp(i*x+h))/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h))/(g*x+f),x)
```

```
[Out] Integral((d + e*exp(h)*exp(i*x))/((f + g*x)*(a + b*exp(h)*exp(i*x) + c*exp(
2*h)*exp(2*i*x))), x)
```

3.577 $\int \frac{d+ee^{h+ix}}{\left(a+be^{h+ix}+ce^{2h+2ix}\right)(f+gx)^2}\,dx$

Optimal. Leaf size=84

$$d\text{Int}\left(\frac{1}{(f+gx)^2\left(a+be^{h+ix}+ce^{2h+2ix}\right)},x\right)+e\text{Int}\left(\frac{e^{h+ix}}{(f+gx)^2\left(a+be^{h+ix}+ce^{2h+2ix}\right)},x\right)$$

```
[Out] d*CannotIntegrate(1/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h))/(g*x+f)^2,x)+e*Cannot
Integrate(exp(i*x+h)/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h))/(g*x+f)^2,x)
```

Rubi [A] time = 0.87, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{d+ee^{h+ix}}{\left(a+be^{h+ix}+ce^{2h+2ix}\right)(f+gx)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(d + e*E^(h + i*x))/((a + b*E^(h + i*x) + c*E^(2*h + 2*i*x))*(f + g*x)^
2),x]
```

```
[Out] d*Defer[Int][1/((a + b*E^(h + i*x) + c*E^(2*h + 2*i*x))*(f + g*x)^2), x] +
e*Defer[Int][E^(h + i*x)/((a + b*E^(h + i*x) + c*E^(2*h + 2*i*x))*(f + g*x)
^2), x]
```

Rubi steps

$$\int \frac{d+ee^{h+577x}}{\left(a+be^{h+577x}+ce^{2h+1154x}\right)(f+gx)^2}\,dx=\int\left(\frac{d}{\left(a+be^{h+577x}+ce^{2h+1154x}\right)(f+gx)^2}+\frac{ee^{h+577x}}{\left(a+be^{h+577x}+ce^{2h+11\cdots}\right.}\right.$$

$$=d\int\frac{1}{\left(a+be^{h+577x}+ce^{2h+1154x}\right)(f+gx)^2}\,dx+e\int\frac{}{\left(a+be^{h+577x}\cdots\right.}$$

Mathematica [A] time = 6.01, size = 0, normalized size = 0.00

$$\int \frac{d+ee^{h+ix}}{\left(a+be^{h+ix}+ce^{2h+2ix}\right)(f+gx)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(d + e*E^(h + i*x))/((a + b*E^(h + i*x) + c*E^(2*h + 2*i*x))*(f +
 g*x)^2),x]
```

```
[Out] Integrate[(d + e*E^(h + i*x))/((a + b*E^(h + i*x) + c*E^(2*h + 2*i*x))*(f +
 g*x)^2), x]
```

fricas [A] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{ee^{(ix+h)} + d}{ag^2x^2 + 2\,afgx + af^2 + \left(cg^2x^2 + 2\,cfgx + cf^2\right)e^{(2\,ix+2\,h)} + \left(bg^2x^2 + 2\,bfgx + bf^2\right)e^{(ix+h)}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*exp(i*x+h))/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h))/(g*x+f)^2,x, a
lgorithm="fricas")
```

```
[Out] integral((e*e^(i*x + h) + d)/(a*g^2*x^2 + 2*a*f*g*x + a*f^2 + (c*g^2*x^2 +
2*c*f*g*x + c*f^2)*e^(2*i*x + 2*h) + (b*g^2*x^2 + 2*b*f*g*x + b*f^2)*e^(i*x
 + h)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{ee^{(ix+h)} + d}{\left(gx + f\right)^2 \left(ce^{(2\,ix+2\,h)} + be^{(ix+h)} + a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*exp(i*x+h))/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h))/(g*x+f)^2,x, a
lgorithm="giac")
```

```
[Out] integrate((e*e^(i*x + h) + d)/((g*x + f)^2*(c*e^(2*i*x + 2*h) + b*e^(i*x +
h) + a)), x)
```

maple [A] time = 0.29, size = 0, normalized size = 0.00

$$\int \frac{e\,\mathrm{e}^{ix+h} + d}{\left(b\,\mathrm{e}^{ix+h} + c\,\mathrm{e}^{2ix+2h} + a\right)\left(gx + f\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*exp(i*x+h)+d)/(b*exp(i*x+h)+c*exp(2*i*x+2*h)+a)/(g*x+f)^2,x)
```

```
[Out] int((e*exp(i*x+h)+d)/(b*exp(i*x+h)+c*exp(2*i*x+2*h)+a)/(g*x+f)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{ee^{(ix+h)} + d}{\left(gx + f\right)^2 \left(ce^{(2\,ix+2\,h)} + be^{(ix+h)} + a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*exp(i*x+h))/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h))/(g*x+f)^2,x, a
lgorithm="maxima")
```

```
[Out] integrate((e*e^(i*x + h) + d)/((g*x + f)^2*(c*e^(2*i*x + 2*h) + b*e^(i*x +
h) + a)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{d+e\,\mathrm{e}^{h+i\,x}}{{\left(f+g\,x\right)}^2\,\left(a+b\,\mathrm{e}^{h+i\,x}+c\,\mathrm{e}^{2\,h+2\,i\,x}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d + e*exp(h + i*x))/((f + g*x)^2*(a + b*exp(h + i*x) + c*exp(2*h + 2*i
*x))),x)
```

```
[Out] int((d + e*exp(h + i*x))/((f + g*x)^2*(a + b*exp(h + i*x) + c*exp(2*h + 2*i
*x))), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*exp(i*x+h))/(a+b*exp(i*x+h)+c*exp(2*i*x+2*h))/(g*x+f)**2,x)
```

```
[Out] Timed out
```

3.578 $\int \frac{\left(be-aee^{c+dx}\right)x}{be-2aee^{c+dx}-bee^{2(c+dx)}}\,dx$

Optimal. Leaf size=150

$$-\frac{\mathrm{Li}_2\left(-\frac{be^{c+dx}}{a-\sqrt{a^2+b^2}}\right)}{2d^2}-\frac{\mathrm{Li}_2\left(-\frac{be^{c+dx}}{a+\sqrt{a^2+b^2}}\right)}{2d^2}-\frac{x\log\left(\frac{be^{c+dx}}{a-\sqrt{a^2+b^2}}+1\right)}{2d}-\frac{x\log\left(\frac{be^{c+dx}}{\sqrt{a^2+b^2}+a}+1\right)}{2d}+\frac{x^2}{2}$$

```
[Out] 1/2*x^2-1/2*x*ln(1+b*exp(d*x+c)/(a-(a^2+b^2)^(1/2)))/d-1/2*x*ln(1+b*exp(d*x
+c)/(a+(a^2+b^2)^(1/2)))/d-1/2*polylog(2,-b*exp(d*x+c)/(a-(a^2+b^2)^(1/2)))
/d^2-1/2*polylog(2,-b*exp(d*x+c)/(a+(a^2+b^2)^(1/2)))/d^2
```

Rubi [A] time = 0.67, antiderivative size = 150, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 5, integrand size = 47, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.106, Rules used = {2265, 2184, 2190, 2279, 2391}

$$-\frac{\mathrm{PolyLog}\left(2,-\frac{be^{c+dx}}{a-\sqrt{a^2+b^2}}\right)}{2d^2}-\frac{\mathrm{PolyLog}\left(2,-\frac{be^{c+dx}}{\sqrt{a^2+b^2}+a}\right)}{2d^2}-\frac{x\log\left(\frac{be^{c+dx}}{a-\sqrt{a^2+b^2}}+1\right)}{2d}-\frac{x\log\left(\frac{be^{c+dx}}{\sqrt{a^2+b^2}+a}+1\right)}{2d}+\frac{x^2}{2}$$

Antiderivative was successfully verified.

```
[In] Int[((b*e - a*e*E^(c + d*x))*x)/(b*e - 2*a*e*E^(c + d*x) - b*e*E^(2*(c + d*
x))),x]
```

```
[Out] x^2/2 - (x*Log[1 + (b*E^(c + d*x))/(a - Sqrt[a^2 + b^2])])/(2*d) - (x*Log[1
 + (b*E^(c + d*x))/(a + Sqrt[a^2 + b^2])])/(2*d) - PolyLog[2, -((b*E^(c + d
*x))/(a - Sqrt[a^2 + b^2]))]/(2*d^2) - PolyLog[2, -((b*E^(c + d*x))/(a + Sq
rt[a^2 + b^2]))]/(2*d^2)
```

Rule 2184

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[((c + d*x)^m*(F^(g*(e + f*x)))^n)/(a + b*(F^(g*(e + f*x)))^n), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2265

```
Int[(((i_.)*(F_)^(u_) + (h_))*((f_.) + (g_.)*(x_))^(m_.))/((a_.) + (b_.)*(F
_)^(u_) + (c_.)*(F_)^(v_)), x_Symbol] :> With[{q = Rt[b^2 - 4*a*c, 2]}, Dis
t[Simplify[(2*c*h - b*i)/q] + i, Int[(f + g*x)^m/(b - q + 2*c*F^u), x], x]
- Dist[Simplify[(2*c*h - b*i)/q] - i, Int[(f + g*x)^m/(b + q + 2*c*F^u), x]
, x]] /; FreeQ[{F, a, b, c, f, g, h, i}, x] && EqQ[v, 2*u] && LinearQ[u, x]
 && NeQ[b^2 - 4*a*c, 0] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\left(be-aee^{c+dx}\right)x}{be-2aee^{c+dx}-bee^{2(c+dx)}}\,dx = -\left(\left(\left(\left(a-\sqrt{a^2+b^2}\right)e\right)\int \frac{x}{-2ae+2\sqrt{a^2+b^2}\,e-2bee^{c+dx}}\,dx\right)-\left(\left(a+\sqrt{a^2+b^2}\right.\right.\right.$$

$$=\frac{x^2}{2}+(be)\int \frac{e^{c+dx}x}{-2ae-2\sqrt{a^2+b^2}\,e-2bee^{c+dx}}\,dx+(be)\int \frac{e^{c+dx}x}{-2ae+2\sqrt{a^2+b^2}\,e-}$$

$$=\frac{x^2}{2}-\frac{x\log\left(1+\frac{be^{c+dx}}{a-\sqrt{a^2+b^2}}\right)}{2d}-\frac{x\log\left(1+\frac{be^{c+dx}}{a+\sqrt{a^2+b^2}}\right)}{2d}+\frac{\int \log\left(1-\frac{2bee^{c+dx}}{-2ae-2\sqrt{a^2+b^2}\,e}\right.}{2d}$$

$$=\frac{x^2}{2}-\frac{x\log\left(1+\frac{be^{c+dx}}{a-\sqrt{a^2+b^2}}\right)}{2d}-\frac{x\log\left(1+\frac{be^{c+dx}}{a+\sqrt{a^2+b^2}}\right)}{2d}+\frac{\text{Subst}\left(\int \frac{\log\left(1-\frac{2bex}{-2ae-2\sqrt{a^2+b}}\right.}{x}\right.}{2d^2}$$

$$=\frac{x^2}{2}-\frac{x\log\left(1+\frac{be^{c+dx}}{a-\sqrt{a^2+b^2}}\right)}{2d}-\frac{x\log\left(1+\frac{be^{c+dx}}{a+\sqrt{a^2+b^2}}\right)}{2d}-\frac{\text{Li}_2\left(-\frac{be^{c+dx}}{a-\sqrt{a^2+b^2}}\right)}{2d^2}-\frac{\text{Li}_2\left(\right.}{}$$

Mathematica [B] time = 0.43, size = 398, normalized size = 2.65

$$\left(\sqrt{a^2+b^2}+a\right)\text{Li}_2\left(\frac{\left(\sqrt{a^2+b^2}-a\right)e^{-c-dx}}{b}\right)+\left(\sqrt{a^2+b^2}-a\right)\text{Li}_2\left(-\frac{\left(a+\sqrt{a^2+b^2}\right)e^{-c-dx}}{b}\right)+a\text{Li}_2\left(\frac{be^{c+dx}}{\sqrt{a^2+b^2}-a}\right)-a\text{Li}_2\left(-\frac{be^{c}}{a+\sqrt{a}}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((b*e - a*e*E^(c + d*x))*x)/(b*e - 2*a*e*E^(c + d*x) - b*e*E^(2*(
c + d*x))),x]
```

```
[Out] (-(a*d*x*Log[1 + ((a - Sqrt[a^2 + b^2])*E^(-c - d*x))/b]) - Sqrt[a^2 + b^2]
*d*x*Log[1 + ((a - Sqrt[a^2 + b^2])*E^(-c - d*x))/b] + a*d*x*Log[1 + ((a +
Sqrt[a^2 + b^2])*E^(-c - d*x))/b] - Sqrt[a^2 + b^2]*d*x*Log[1 + ((a + Sqrt[
a^2 + b^2])*E^(-c - d*x))/b] + a*d*x*Log[1 + (b*E^(c + d*x))/(a - Sqrt[a^2
+ b^2])] - a*d*x*Log[1 + (b*E^(c + d*x))/(a + Sqrt[a^2 + b^2])] + (a + Sqrt
[a^2 + b^2])*PolyLog[2, ((-a + Sqrt[a^2 + b^2])*E^(-c - d*x))/b] + (-a + Sq
rt[a^2 + b^2])*PolyLog[2, -(((a + Sqrt[a^2 + b^2])*E^(-c - d*x))/b)] + a*Po
lyLog[2, (b*E^(c + d*x))/(-a + Sqrt[a^2 + b^2])] - a*PolyLog[2, -((b*E^(c +
 d*x))/(a + Sqrt[a^2 + b^2]))])/(2*Sqrt[a^2 + b^2]*d^2)
```

fricas [A] time = 0.54, size = 251, normalized size = 1.67

$$\frac{d^2x^2 + c\log\left(2\,be^{(dx+c)} + 2\,b\sqrt{\frac{a^2+b^2}{b^2}} + 2\,a\right) + c\log\left(2\,be^{(dx+c)} - 2\,b\sqrt{\frac{a^2+b^2}{b^2}} + 2\,a\right) - (dx+c)\log\left(-\frac{b\sqrt{\frac{a^2+b^2}{b^2}}\,e^{(dx+c)}+a}{b}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*e-a*e*exp(d*x+c))*x/(b*e-2*a*e*exp(d*x+c)-b*e*exp(2*d*x+2*c)),
x, algorithm="fricas")
```

```
[Out] 1/2*(d^2*x^2 + c*log(2*b*e^(d*x + c) + 2*b*sqrt((a^2 + b^2)/b^2) + 2*a) + c
*log(2*b*e^(d*x + c) - 2*b*sqrt((a^2 + b^2)/b^2) + 2*a) - (d*x + c)*log(-(b
*sqrt((a^2 + b^2)/b^2)*e^(d*x + c) + a*e^(d*x + c) - b)/b) - (d*x + c)*log(
(b*sqrt((a^2 + b^2)/b^2)*e^(d*x + c) - a*e^(d*x + c) + b)/b) - dilog((b*sqr
t((a^2 + b^2)/b^2)*e^(d*x + c) + a*e^(d*x + c) - b)/b + 1) - dilog(-(b*sqrt
((a^2 + b^2)/b^2)*e^(d*x + c) - a*e^(d*x + c) + b)/b + 1))/d^2
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(aee^{(dx+c)} - be\right)x}{bee^{(2\,dx+2\,c)} + 2\,aee^{(dx+c)} - be}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*e-a*e*exp(d*x+c))*x/(b*e-2*a*e*exp(d*x+c)-b*e*exp(2*d*x+2*c)),
x, algorithm="giac")
```

```
[Out] integrate((a*e*e^(d*x + c) - b*e)*x/(b*e*e^(2*d*x + 2*c) + 2*a*e*e^(d*x + c
) - b*e), x)
```

maple [B] time = 0.05, size = 285, normalized size = 1.90

$$\frac{x^2}{2}-\frac{x\ln\left(\frac{b\,\mathrm{e}^{dx}\mathrm{e}^{2c}+a\,\mathrm{e}^{c}-\sqrt{a^2\mathrm{e}^{2c}+b^2\mathrm{e}^{2c}}}{a\,\mathrm{e}^{c}-\sqrt{a^2\mathrm{e}^{2c}+b^2\mathrm{e}^{2c}}}\right)}{2d}-\frac{x\ln\left(\frac{b\,\mathrm{e}^{dx}\mathrm{e}^{2c}+a\,\mathrm{e}^{c}+\sqrt{a^2\mathrm{e}^{2c}+b^2\mathrm{e}^{2c}}}{a\,\mathrm{e}^{c}+\sqrt{a^2\mathrm{e}^{2c}+b^2\mathrm{e}^{2c}}}\right)}{2d}-\frac{\mathrm{dilog}\left(\frac{b\,\mathrm{e}^{dx}\mathrm{e}^{2c}+a\,\mathrm{e}^{c}-\sqrt{a^2\mathrm{e}^{2c}+b^2\mathrm{e}^{2c}}}{a\,\mathrm{e}^{c}-\sqrt{a^2\mathrm{e}^{2c}+b^2\mathrm{e}^{2c}}}\right)}{2d^2}-\frac{\mathrm{dilog}\left(\frac{b\,\mathrm{e}^{dx}\mathrm{e}}{a}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*e-a*e*exp(d*x+c))*x/(b*e-2*a*e*exp(d*x+c)-b*e*exp(2*d*x+2*c)),x)
```

```
[Out] -1/2/d*x*ln((exp(2*c)*exp(d*x)*b+exp(c)*a-(exp(c)^2*a^2+exp(2*c)*b^2)^(1/2)
)/(exp(c)*a-(exp(c)^2*a^2+exp(2*c)*b^2)^(1/2)))-1/2/d*x*ln((exp(2*c)*exp(d*
x)*b+exp(c)*a+(exp(c)^2*a^2+exp(2*c)*b^2)^(1/2))/(exp(c)*a+(exp(c)^2*a^2+ex
p(2*c)*b^2)^(1/2)))-1/2/d^2*dilog((exp(2*c)*exp(d*x)*b+exp(c)*a-(exp(c)^2*a
^2+exp(2*c)*b^2)^(1/2))/(exp(c)*a-(exp(c)^2*a^2+exp(2*c)*b^2)^(1/2)))-1/2/d
^2*dilog((exp(2*c)*exp(d*x)*b+exp(c)*a+(exp(c)^2*a^2+exp(2*c)*b^2)^(1/2))/(
exp(c)*a+(exp(c)^2*a^2+exp(2*c)*b^2)^(1/2)))+1/2*x^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(aee^{(dx+c)} - be\right)x}{bee^{(2\,dx+2\,c)} + 2\,aee^{(dx+c)} - be}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*e-a*e*exp(d*x+c))*x/(b*e-2*a*e*exp(d*x+c)-b*e*exp(2*d*x+2*c)),
x, algorithm="maxima")
```

```
[Out] integrate((a*e*e^(d*x + c) - b*e)*x/(b*e*e^(2*d*x + 2*c) + 2*a*e*e^(d*x + c
) - b*e), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int -\frac{x\,\left(b\,e-a\,e\,\mathrm{e}^{c+d\,x}\right)}{2\,a\,e\,\mathrm{e}^{c+d\,x}-b\,e+b\,e\,\mathrm{e}^{2\,c+2\,d\,x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-(x*(b*e - a*e*exp(c + d*x)))/(2*a*e*exp(c + d*x) - b*e + b*e*exp(2*c +
 2*d*x)),x)
```

```
[Out] int(-(x*(b*e - a*e*exp(c + d*x)))/(2*a*e*exp(c + d*x) - b*e + b*e*exp(2*c +
 2*d*x)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x\left(ae^{c}e^{dx} - b\right)}{2ae^{c}e^{dx} + be^{2c}e^{2dx} - b}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*e-a*e*exp(d*x+c))*x/(b*e-2*a*e*exp(d*x+c)-b*e*exp(2*d*x+2*c)),
x)
```

```
[Out] Integral(x*(a*exp(c)*exp(d*x) - b)/(2*a*exp(c)*exp(d*x) + b*exp(2*c)*exp(2*
d*x) - b), x)
```

3.579 $\int F^{a+b\log(c+dx^n)}x^2\,dx$

Optimal. Leaf size=65

$$\frac{1}{3}x^3F^a\left(c+dx^n\right)^{b\log(F)}\left(\frac{dx^n}{c}+1\right)^{-b\log(F)}\ {}_2F_1\left(\frac{3}{n},-b\log(F);\frac{n+3}{n};-\frac{dx^n}{c}\right)$$

```
[Out] 1/3*F^a*x^3*(c+d*x^n)^(b*ln(F))*hypergeom([3/n, -b*ln(F)],[(3+n)/n],-d*x^n/
c)/((1+d*x^n/c)^(b*ln(F)))
```

Rubi [A] time = 0.05, antiderivative size = 65, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {2274, 12, 365, 364}

$$\frac{1}{3}x^3F^a\left(c+dx^n\right)^{b\log(F)}\left(\frac{dx^n}{c}+1\right)^{-b\log(F)}\ {}_2F_1\left(\frac{3}{n},-b\log(F);\frac{n+3}{n};-\frac{dx^n}{c}\right)$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*Log[c + d*x^n])*x^2,x]
```

```
[Out] (F^a*x^3*(c + d*x^n)^(b*Log[F])*Hypergeometric2F1[3/n, -(b*Log[F]), (3 + n)
/n, -((d*x^n)/c)])/(3*(1 + (d*x^n)/c)^(b*Log[F]))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rule 365

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[(a^
IntPart[p]*(a + b*x^n)^FracPart[p])/(1 + (b*x^n)/a)^FracPart[p], Int[(c*x)^
m*(1 + (b*x^n)/a)^p, x], x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0]
 &&  !(ILtQ[p, 0] || GtQ[a, 0])
```

Rule 2274

```
Int[(u_.)*(F_)^((a_.)*(Log[z_]*(b_.) + (v_.))), x_Symbol] :> Int[u*F^(a*v)*
z^(a*b*Log[F]), x] /; FreeQ[{F, a, b}, x]
```

Rubi steps

$$\begin{aligned}
\int F^{a+b\log(c+dx^n)}x^2\,dx &= \int F^a x^2\left(c+dx^n\right)^{b\log(F)}\,dx \\
&= F^a\int x^2\left(c+dx^n\right)^{b\log(F)}\,dx \\
&= \left(F^a\left(c+dx^n\right)^{b\log(F)}\left(1+\frac{dx^n}{c}\right)^{-b\log(F)}\right)\int x^2\left(1+\frac{dx^n}{c}\right)^{b\log(F)}\,dx \\
&= \frac{1}{3}F^a x^3\left(c+dx^n\right)^{b\log(F)}\left(1+\frac{dx^n}{c}\right)^{-b\log(F)}\,{}_2F_1\left(\frac{3}{n},-b\log(F);\frac{3+n}{n};-\frac{dx^n}{c}\right)
\end{aligned}$$

Mathematica [A] time = 0.18, size = 85, normalized size = 1.31

$$-\frac{x^3\left(-\frac{dx^n}{c}\right)^{-3/n}\left(c+dx^n\right)F^{a+b\log(c+dx^n)}\,{}_2F_1\left(\frac{n-3}{n},b\log(F)+1;b\log(F)+2;\frac{dx^n}{c}+1\right)}{cn(b\log(F)+1)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*Log[c + d*x^n])*x^2,x]
[Out] -((F^(a + b*Log[c + d*x^n])*x^3*(c + d*x^n)*Hypergeometric2F1[(-3 + n)/n, 1
 + b*Log[F], 2 + b*Log[F], 1 + (d*x^n)/c])/(c*n*(-((d*x^n)/c))^(3/n)*(1 + b
*Log[F])))
```

fricas [F] time = 0.77, size = 0, normalized size = 0.00

$$\text{integral}\left(F^{b\log(dx^n+c)+a}x^2,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*log(c+d*x^n))*x^2,x, algorithm="fricas")
[Out] integral(F^(b*log(d*x^n + c) + a)*x^2, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{b\log(dx^n+c)+a}x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*log(c+d*x^n))*x^2,x, algorithm="giac")
```

```
[Out] integrate(F^(b*log(d*x^n + c) + a)*x^2, x)
```

maple [F] time = 0.06, size = 0, normalized size = 0.00

$$\int x^{2} F^{b \ln \left(d \,x^{n}+c \right)+a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a+b*ln(c+d*x^n))*x^2,x)
```

```
[Out] int(F^(a+b*ln(c+d*x^n))*x^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{b \log\left(d x^{n} + c\right) + a} x^{2}\,{d x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*log(c+d*x^n))*x^2,x, algorithm="maxima")
```

```
[Out] integrate(F^(b*log(d*x^n + c) + a)*x^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int F^{a+b\,\ln\left(c+d\,x^n\right)}\,x^2 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*log(c + d*x^n))*x^2,x)
```

```
[Out] int(F^(a + b*log(c + d*x^n))*x^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*ln(c+d*x**n))*x**2,x)
```

```
[Out] Timed out
```

3.580 $\int F^{a+b\log(c+dx^n)}x\,dx$

Optimal. Leaf size=65

$$\frac{1}{2}x^2F^a(c+dx^n)^{b\log(F)}\left(\frac{dx^n}{c}+1\right)^{-b\log(F)}{}_2F_1\left(\frac{2}{n},-b\log(F);\frac{n+2}{n};-\frac{dx^n}{c}\right)$$

```
[Out] 1/2*F^a*x^2*(c+d*x^n)^(b*ln(F))*hypergeom([2/n, -b*ln(F)],[(2+n)/n],-d*x^n/
c)/((1+d*x^n/c)^(b*ln(F)))
```

Rubi [A] time = 0.03, antiderivative size = 65, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {2274, 12, 365, 364}

$$\frac{1}{2}x^2F^a(c+dx^n)^{b\log(F)}\left(\frac{dx^n}{c}+1\right)^{-b\log(F)}{}_2F_1\left(\frac{2}{n},-b\log(F);\frac{n+2}{n};-\frac{dx^n}{c}\right)$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*Log[c + d*x^n])*x,x]
```

```
[Out] (F^a*x^2*(c + d*x^n)^(b*Log[F])*Hypergeometric2F1[2/n, -(b*Log[F]), (2 + n)
/n, -((d*x^n)/c)])/(2*(1 + (d*x^n)/c)^(b*Log[F]))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] && !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rule 365

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[(a^
IntPart[p]*(a + b*x^n)^FracPart[p])/(1 + (b*x^n)/a)^FracPart[p], Int[(c*x)^
m*(1 + (b*x^n)/a)^p, x], x] /; FreeQ[{a, b, c, m, n, p}, x] && !IGtQ[p, 0]
 && !(ILtQ[p, 0] || GtQ[a, 0])
```

Rule 2274

```
Int[(u_.)*(F_)^((a_.)*(Log[z_]*(b_.) + (v_.))), x_Symbol] :> Int[u*F^(a*v)*
z^(a*b*Log[F]), x] /; FreeQ[{F, a, b}, x]
```

Rubi steps

$$
\begin{aligned}
\int F^{a+b\log(c+dx^n)}x\,dx &= \int F^a x\,(c+dx^n)^{b\log(F)}\,dx \\
&= F^a\int x\,(c+dx^n)^{b\log(F)}\,dx \\
&= \left(F^a\,(c+dx^n)^{b\log(F)}\left(1+\frac{dx^n}{c}\right)^{-b\log(F)}\right)\int x\left(1+\frac{dx^n}{c}\right)^{b\log(F)}\,dx \\
&= \frac{1}{2}F^a x^2\,(c+dx^n)^{b\log(F)}\left(1+\frac{dx^n}{c}\right)^{-b\log(F)}\,{}_2F_1\left(\frac{2}{n},-b\log(F);\frac{2+n}{n};-\frac{dx^n}{c}\right)
\end{aligned}
$$

Mathematica [A] time = 0.11, size = 85, normalized size = 1.31

$$
-\frac{x^2\left(-\frac{dx^n}{c}\right)^{-2/n}(c+dx^n)\,F^{a+b\log(c+dx^n)}\,{}_2F_1\left(\frac{n-2}{n},b\log(F)+1;b\log(F)+2;\frac{dx^n}{c}+1\right)}{cn(b\log(F)+1)}
$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*Log[c + d*x^n])*x,x]
```

```
[Out] -((F^(a + b*Log[c + d*x^n])*x^2*(c + d*x^n)*Hypergeometric2F1[(-2 + n)/n, 1
 + b*Log[F], 2 + b*Log[F], 1 + (d*x^n)/c])/(c*n*(-((d*x^n)/c))^(2/n)*(1 + b
*Log[F])))
```

fricas [F] time = 0.47, size = 0, normalized size = 0.00

$$
\mathrm{integral}\left(F^{b\log(dx^n+c)+a}x,x\right)
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*log(c+d*x^n))*x,x, algorithm="fricas")
```

```
[Out] integral(F^(b*log(d*x^n + c) + a)*x, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$
\int F^{b\log(dx^n+c)+a}x\,dx
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*log(c+d*x^n))*x,x, algorithm="giac")
```

```
[Out] integrate(F^(b*log(d*x^n + c) + a)*x, x)
```

maple [F] time = 0.05, size = 0, normalized size = 0.00

$$\int x\,F^{b\ln(d\,x^{n}+c)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(b*ln(d*x^n+c)+a)*x,x)
```

```
[Out] int(F^(b*ln(d*x^n+c)+a)*x,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{b\log(dx^{n}+c)+a}x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*log(c+d*x^n))*x,x, algorithm="maxima")
```

```
[Out] integrate(F^(b*log(d*x^n + c) + a)*x, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int F^{a+b\,\ln(c+d\,x^{n})}\,x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*log(c + d*x^n))*x,x)
```

```
[Out] int(F^(a + b*log(c + d*x^n))*x, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*ln(c+d*x**n))*x,x)
```

```
[Out] Timed out
```

3.581 $\int F^{a+b\log(c+dx^n)}\,dx$

Optimal. Leaf size=56

$$xF^a(c+dx^n)^{b\log(F)}\left(\frac{dx^n}{c}+1\right)^{-b\log(F)}{}_2F_1\left(\frac{1}{n},-b\log(F);1+\frac{1}{n};-\frac{dx^n}{c}\right)$$

```
[Out] F^a*x*(c+d*x^n)^(b*ln(F))*hypergeom([1/n, -b*ln(F)],[1+1/n],-d*x^n/c)/((1+d
*x^n/c)^(b*ln(F)))
```

Rubi [A] time = 0.02, antiderivative size = 56, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {2274, 12, 246, 245}

$$xF^a(c+dx^n)^{b\log(F)}\left(\frac{dx^n}{c}+1\right)^{-b\log(F)}{}_2F_1\left(\frac{1}{n},-b\log(F);1+\frac{1}{n};-\frac{dx^n}{c}\right)$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*Log[c + d*x^n]),x]
```

```
[Out] (F^a*x*(c + d*x^n)^(b*Log[F])*Hypergeometric2F1[n^(-1), -(b*Log[F]), 1 + n^
(-1), -((d*x^n)/c)])/(1 + (d*x^n)/c)^(b*Log[F])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 245

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[a^p*x*Hypergeometric2F
1[-p, 1/n, 1/n + 1, -((b*x^n)/a)], x] /; FreeQ[{a, b, n, p}, x] &&  !IGtQ[p
, 0] &&  !IntegerQ[1/n] &&  !ILtQ[Simplify[1/n + p], 0] && (IntegerQ[p] ||
GtQ[a, 0])
```

Rule 246

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[(a^IntPart[p]*(a + b*x
^n)^FracPart[p])/(1 + (b*x^n)/a)^FracPart[p], Int[(1 + (b*x^n)/a)^p, x], x]
 /; FreeQ[{a, b, n, p}, x] &&  !IGtQ[p, 0] &&  !IntegerQ[1/n] &&  !ILtQ[Sim
plify[1/n + p], 0] &&  !(IntegerQ[p] || GtQ[a, 0])
```

Rule 2274

```
Int[(u_.)*(F_)^((a_.)*(Log[z_]*(b_.) + (v_.))), x_Symbol] :> Int[u*F^(a*v)*
z^(a*b*Log[F]), x] /; FreeQ[{F, a, b}, x]
```

Rubi steps

$$\begin{aligned}\int F^{a+b\log(c+dx^n)}\,dx &= \int F^a\left(c+dx^n\right)^{b\log(F)}\,dx\\ &= F^a\int\left(c+dx^n\right)^{b\log(F)}\,dx\\ &= \left(F^a\left(c+dx^n\right)^{b\log(F)}\left(1+\frac{dx^n}{c}\right)^{-b\log(F)}\right)\int\left(1+\frac{dx^n}{c}\right)^{b\log(F)}\,dx\\ &= F^a x\left(c+dx^n\right)^{b\log(F)}\left(1+\frac{dx^n}{c}\right)^{-b\log(F)}{}_2F_1\left(\frac{1}{n},-b\log(F);1+\frac{1}{n};-\frac{dx^n}{c}\right)\end{aligned}$$

Mathematica [A] time = 0.09, size = 83, normalized size = 1.48

$$-\frac{x\left(-\frac{dx^n}{c}\right)^{-1/n}\left(c+dx^n\right)F^{a+b\log(c+dx^n)}\,{}_2F_1\left(\frac{n-1}{n},b\log(F)+1;b\log(F)+2;\frac{dx^n}{c}+1\right)}{cn(b\log(F)+1)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*Log[c + d*x^n]),x]
```

```
[Out] -((F^(a + b*Log[c + d*x^n])*x*(c + d*x^n)*Hypergeometric2F1[(-1 + n)/n, 1 +
 b*Log[F], 2 + b*Log[F], 1 + (d*x^n)/c])/(c*n*(-((d*x^n)/c))^n^(-1)*(1 + b*
Log[F])))
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(F^{b\log(dx^n+c)+a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*log(c+d*x^n)),x, algorithm="fricas")
```

```
[Out] integral(F^(b*log(d*x^n + c) + a), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{b\log(dx^n+c)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*log(c+d*x^n)),x, algorithm="giac")
```

```
[Out] integrate(F^(b*log(d*x^n + c) + a), x)
```

maple [F] time = 0.09, size = 0, normalized size = 0.00

$$\int F^{b\ln(d\,x^{n}+c)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(b*ln(d*x^n+c)+a),x)
```

```
[Out] int(F^(b*ln(d*x^n+c)+a),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{b\log(dx^{n}+c)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*log(c+d*x^n)),x, algorithm="maxima")
```

```
[Out] integrate(F^(b*log(d*x^n + c) + a), x)
```

mupad [B] time = 4.01, size = 58, normalized size = 1.04

$$\frac{F^{a}\,x\,\left(c+d\,x^{n}\right)^{b\,\ln(F)}\,{}_2\mathrm{F}_1\left(\frac{1}{n},-b\,\ln(F);\ \frac{1}{n}+1;\ -\frac{d\,x^{n}}{c}\right)}{\left(\frac{d\,x^{n}}{c}+1\right)^{b\,\ln(F)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*log(c + d*x^n)),x)
```

```
[Out] (F^a*x*(c + d*x^n)^(b*log(F))*hypergeom([1/n, -b*log(F)], 1/n + 1, -(d*x^n)
/c))/((d*x^n)/c + 1)^(b*log(F))
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*ln(c+d*x**n)),x)
```

```
[Out] Timed out
```

3.582 $\int \frac{F^{a+b\log\left(c+dx^n\right)}}{x}\,dx$

Optimal. Leaf size=57

$$-\frac{F^a\left(c+dx^n\right)^{b\log(F)+1}\,{}_2F_1\left(1,b\log(F)+1;b\log(F)+2;\frac{dx^n}{c}+1\right)}{cn(b\log(F)+1)}$$

```
[Out] -F^a*(c+d*x^n)^(1+b*ln(F))*hypergeom([1, 1+b*ln(F)],[2+b*ln(F)],1+d*x^n/c)/
c/n/(1+b*ln(F))
```

Rubi [A] time = 0.06, antiderivative size = 57, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {2274, 12, 266, 65}

$$-\frac{F^a\left(c+dx^n\right)^{b\log(F)+1}\,{}_2F_1\left(1,b\log(F)+1;b\log(F)+2;\frac{dx^n}{c}+1\right)}{cn(b\log(F)+1)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*Log[c + d*x^n])/x,x]
```

```
[Out] -((F^a*(c + d*x^n)^(1 + b*Log[F])*Hypergeometric2F1[1, 1 + b*Log[F], 2 + b*
Log[F], 1 + (d*x^n)/c])/(c*n*(1 + b*Log[F])))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 65

```
Int[((b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((c + d*x
)^(n + 1)*Hypergeometric2F1[-m, n + 1, n + 2, 1 + (d*x)/c])/(d*(n + 1)*(-(d
/(b*c)))^m), x] /; FreeQ[{b, c, d, m, n}, x] && !IntegerQ[n] && (IntegerQ[
m] || GtQ[-(d/(b*c)), 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2274

```
Int[(u_.)*(F_)^((a_.)*(Log[z_]*(b_.) + (v_.))), x_Symbol] :> Int[u*F^(a*v)*
z^(a*b*Log[F]), x] /; FreeQ[{F, a, b}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{F^{a+b\log(c+dx^n)}}{x}\,dx &= \int \frac{F^a\left(c+dx^n\right)^{b\log(F)}}{x}\,dx\\ &= F^a\int \frac{\left(c+dx^n\right)^{b\log(F)}}{x}\,dx\\ &= \frac{F^a\,\mathrm{Subst}\left(\int \frac{(c+dx)^{b\log(F)}}{x}\,dx,x,x^n\right)}{n}\\ &= -\frac{F^a\left(c+dx^n\right)^{1+b\log(F)}\,{}_2F_1\left(1,1+b\log(F);2+b\log(F);1+\frac{dx^n}{c}\right)}{cn(1+b\log(F))}\end{aligned}$$

Mathematica [A] time = 0.11, size = 50, normalized size = 0.88

$$-\frac{F^{a+b\log(c+dx^n)}\left({}_2F_1\left(1,b\log(F);b\log(F)+1;\frac{dx^n}{c}+1\right)-1\right)}{bn\log(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*Log[c + d*x^n])/x,x]
```

```
[Out] -((F^(a + b*Log[c + d*x^n])*(-1 + Hypergeometric2F1[1, b*Log[F], 1 + b*Log[
F], 1 + (d*x^n)/c]))/(b*n*Log[F]))
```

fricas [F] time = 0.44, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{F^{b\log(dx^n+c)+a}}{x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*log(c+d*x^n))/x,x, algorithm="fricas")
```

```
[Out] integral(F^(b*log(d*x^n + c) + a)/x, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{b\log(dx^n+c)+a}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*log(c+d*x^n))/x,x, algorithm="giac")
```

```
[Out] integrate(F^(b*log(d*x^n + c) + a)/x, x)
```

maple [F] time = 0.16, size = 0, normalized size = 0.00

$$\int \frac{F^{b \ln(d\,x^n+c)+a}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(b*ln(d*x^n+c)+a)/x,x)
```

```
[Out] int(F^(b*ln(d*x^n+c)+a)/x,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{b \log(dx^n+c)+a}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*log(c+d*x^n))/x,x, algorithm="maxima")
```

```
[Out] integrate(F^(b*log(d*x^n + c) + a)/x, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{F^{a+b\,\ln(c+d\,x^n)}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*log(c + d*x^n))/x,x)
```

```
[Out] int(F^(a + b*log(c + d*x^n))/x, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{a+b\log{(c+dx^n)}}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*ln(c+d*x**n))/x,x)
```

```
[Out] Integral(F**(a + b*log(c + d*x**n))/x, x)
```

3.583 $\int \frac{F^{a+b\log\left(c+dx^n\right)}}{x^2}\,dx$

Optimal. Leaf size=66

$$-\frac{F^a\left(c+dx^n\right)^{b\log(F)}\left(\frac{dx^n}{c}+1\right)^{-b\log(F)}\,{}_2F_1\left(-\frac{1}{n},-b\log(F);-\frac{1-n}{n};-\frac{dx^n}{c}\right)}{x}$$

```
[Out] -F^a*(c+d*x^n)^(b*ln(F))*hypergeom([-1/n, -b*ln(F)],[(-1+n)/n],-d*x^n/c)/x/
((1+d*x^n/c)^(b*ln(F)))
```

Rubi [A] time = 0.05, antiderivative size = 66, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {2274, 12, 365, 364}

$$-\frac{F^a\left(c+dx^n\right)^{b\log(F)}\left(\frac{dx^n}{c}+1\right)^{-b\log(F)}\,{}_2F_1\left(-\frac{1}{n},-b\log(F);-\frac{1-n}{n};-\frac{dx^n}{c}\right)}{x}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*Log[c + d*x^n])/x^2,x]
```

```
[Out] -((F^a*(c + d*x^n)^(b*Log[F])*Hypergeometric2F1[-n^(-1), -(b*Log[F]), -((1
- n)/n), -((d*x^n)/c)])/(x*(1 + (d*x^n)/c)^(b*Log[F])))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rule 365

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[(a^
IntPart[p]*(a + b*x^n)^FracPart[p])/(1 + (b*x^n)/a)^FracPart[p], Int[(c*x)^
m*(1 + (b*x^n)/a)^p, x], x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0]
 &&  !(ILtQ[p, 0] || GtQ[a, 0])
```

Rule 2274

```
Int[(u_.)*(F_)^((a_.)*(Log[z_]*(b_.) + (v_.))), x_Symbol] :> Int[u*F^(a*v)*
z^(a*b*Log[F]), x] /; FreeQ[{F, a, b}, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{F^{a+b\log(c+dx^n)}}{x^2}\,dx &= \int \frac{F^a\,(c+dx^n)^{b\log(F)}}{x^2}\,dx\\
&= F^a \int \frac{(c+dx^n)^{b\log(F)}}{x^2}\,dx\\
&= \left(F^a\,(c+dx^n)^{b\log(F)}\left(1+\frac{dx^n}{c}\right)^{-b\log(F)}\right)\int \frac{\left(1+\frac{dx^n}{c}\right)^{b\log(F)}}{x^2}\,dx\\
&= -\frac{F^a\,(c+dx^n)^{b\log(F)}\left(1+\frac{dx^n}{c}\right)^{-b\log(F)}\,{}_2F_1\left(-\frac{1}{n},-b\log(F);-\frac{1-n}{n};-\frac{dx^n}{c}\right)}{x}
\end{aligned}$$

Mathematica [A] time = 0.12, size = 81, normalized size = 1.23

$$-\frac{\left(-\frac{dx^n}{c}\right)^{\frac{1}{n}}(c+dx^n)\,F^{a+b\log(c+dx^n)}\,{}_2F_1\left(1+\frac{1}{n},b\log(F)+1;b\log(F)+2;\frac{dx^n}{c}+1\right)}{cnx(b\log(F)+1)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*Log[c + d*x^n])/x^2,x]
```

```
[Out] -((F^(a + b*Log[c + d*x^n])*(-((d*x^n)/c))^n^(-1)*(c + d*x^n)*Hypergeometri
c2F1[1 + n^(-1), 1 + b*Log[F], 2 + b*Log[F], 1 + (d*x^n)/c])/(c*n*x*(1 + b*
Log[F])))
```

fricas [F] time = 0.46, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{F^{b\log(dx^n+c)+a}}{x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*log(c+d*x^n))/x^2,x, algorithm="fricas")
```

```
[Out] integral(F^(b*log(d*x^n + c) + a)/x^2, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{b\log(dx^n+c)+a}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*log(c+d*x^n))/x^2,x, algorithm="giac")
[Out] integrate(F^(b*log(d*x^n + c) + a)/x^2, x)
```

maple [F] time = 0.05, size = 0, normalized size = 0.00

$$\int \frac{F^{b\ln(d\,x^n+c)+a}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(b*ln(d*x^n+c)+a)/x^2,x)
[Out] int(F^(b*ln(d*x^n+c)+a)/x^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{b\log(dx^n+c)+a}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*log(c+d*x^n))/x^2,x, algorithm="maxima")
[Out] integrate(F^(b*log(d*x^n + c) + a)/x^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{F^{a+b\,\ln(c+d\,x^n)}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*log(c + d*x^n))/x^2,x)
[Out] int(F^(a + b*log(c + d*x^n))/x^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*ln(c+d*x**n))/x**2,x)
```

```
[Out] Timed out
```

3.584 $\int \frac{F^{a+b\log\left(c+dx^n\right)}}{x^3}\,dx$

Optimal. Leaf size=68

$$-\frac{F^a\left(c+dx^n\right)^{b\log(F)}\left(\frac{dx^n}{c}+1\right)^{-b\log(F)}\,{}_2F_1\left(-\frac{2}{n},-b\log(F);-\frac{2-n}{n};-\frac{dx^n}{c}\right)}{2x^2}$$

```
[Out] -1/2*F^a*(c+d*x^n)^(b*ln(F))*hypergeom([-2/n, -b*ln(F)],[(-2+n)/n],-d*x^n/c
)/x^2/((1+d*x^n/c)^(b*ln(F)))
```

Rubi [A] time = 0.04, antiderivative size = 68, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {2274, 12, 365, 364}

$$-\frac{F^a\left(c+dx^n\right)^{b\log(F)}\left(\frac{dx^n}{c}+1\right)^{-b\log(F)}\,{}_2F_1\left(-\frac{2}{n},-b\log(F);-\frac{2-n}{n};-\frac{dx^n}{c}\right)}{2x^2}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*Log[c + d*x^n])/x^3,x]
```

```
[Out] -(F^a*(c + d*x^n)^(b*Log[F])*Hypergeometric2F1[-2/n, -(b*Log[F]), -((2 - n)
/n), -((d*x^n)/c)])/(2*x^2*(1 + (d*x^n)/c)^(b*Log[F]))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rule 365

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[(a^
IntPart[p]*(a + b*x^n)^FracPart[p])/(1 + (b*x^n)/a)^FracPart[p], Int[(c*x)^
m*(1 + (b*x^n)/a)^p, x], x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0]
 &&  !(ILtQ[p, 0] || GtQ[a, 0])
```

Rule 2274

```
Int[(u_.)*(F_)^((a_.)*(Log[z_]*(b_.) + (v_.))), x_Symbol] :> Int[u*F^(a*v)*
z^(a*b*Log[F]), x] /; FreeQ[{F, a, b}, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{F^{a+b\log(c+dx^n)}}{x^3}\,dx &= \int \frac{F^a\,(c+dx^n)^{b\log(F)}}{x^3}\,dx \\
&= F^a \int \frac{(c+dx^n)^{b\log(F)}}{x^3}\,dx \\
&= \left(F^a\,(c+dx^n)^{b\log(F)}\left(1+\frac{dx^n}{c}\right)^{-b\log(F)}\right)\int \frac{\left(1+\frac{dx^n}{c}\right)^{b\log(F)}}{x^3}\,dx \\
&= -\frac{F^a\,(c+dx^n)^{b\log(F)}\left(1+\frac{dx^n}{c}\right)^{-b\log(F)}\,{}_2F_1\left(-\frac{2}{n},-b\log(F);-\frac{2-n}{n};-\frac{dx^n}{c}\right)}{2x^2}
\end{aligned}$$

Mathematica [A] time = 0.12, size = 85, normalized size = 1.25

$$-\frac{\left(-\frac{dx^n}{c}\right)^{2/n}(c+dx^n)\,F^{a+b\log(c+dx^n)}\,{}_2F_1\left(\frac{n+2}{n},b\log(F)+1;b\log(F)+2;\frac{dx^n}{c}+1\right)}{cnx^2(b\log(F)+1)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*Log[c + d*x^n])/x^3,x]
```

```
[Out] -((F^(a + b*Log[c + d*x^n])*(-((d*x^n)/c))^(2/n)*(c + d*x^n)*Hypergeometric
2F1[(2 + n)/n, 1 + b*Log[F], 2 + b*Log[F], 1 + (d*x^n)/c])/(c*n*x^2*(1 + b*
Log[F])))
```

fricas [F] time = 0.45, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{F^{b\log(dx^n+c)+a}}{x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*log(c+d*x^n))/x^3,x, algorithm="fricas")
```

```
[Out] integral(F^(b*log(d*x^n + c) + a)/x^3, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{b\log(dx^n+c)+a}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*log(c+d*x^n))/x^3,x, algorithm="giac")
[Out] integrate(F^(b*log(d*x^n + c) + a)/x^3, x)
```

maple [F] time = 0.05, size = 0, normalized size = 0.00

$$\int \frac{F^{b\ln(d\,x^n+c)+a}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(b*ln(d*x^n+c)+a)/x^3,x)
[Out] int(F^(b*ln(d*x^n+c)+a)/x^3,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{b\log(dx^n+c)+a}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*log(c+d*x^n))/x^3,x, algorithm="maxima")
[Out] integrate(F^(b*log(d*x^n + c) + a)/x^3, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{F^{a+b\,\ln(c+d\,x^n)}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*log(c + d*x^n))/x^3,x)
[Out] int(F^(a + b*log(c + d*x^n))/x^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*ln(c+d*x**n))/x**3,x)
```

```
[Out] Timed out
```

3.585 $\int F^{a+b\log(c+dx^n)}(dx)^m\,dx$

Optimal. Leaf size=77

$$\frac{F^a(dx)^{m+1}\left(c+dx^n\right)^{b\log(F)}\left(\frac{dx^n}{c}+1\right)^{-b\log(F)}{}_2F_1\left(\frac{m+1}{n},-b\log(F);\frac{m+n+1}{n};-\frac{dx^n}{c}\right)}{d(m+1)}$$

```
[Out] F^a*(d*x)^(1+m)*(c+d*x^n)^(b*ln(F))*hypergeom([(1+m)/n, -b*ln(F)],[(1+m+n)/
n],-d*x^n/c)/d/(1+m)/((1+d*x^n/c)^(b*ln(F)))
```

Rubi [A] time = 0.05, antiderivative size = 77, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2274, 12, 365, 364}

$$\frac{F^a(dx)^{m+1}\left(c+dx^n\right)^{b\log(F)}\left(\frac{dx^n}{c}+1\right)^{-b\log(F)}{}_2F_1\left(\frac{m+1}{n},-b\log(F);\frac{m+n+1}{n};-\frac{dx^n}{c}\right)}{d(m+1)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*Log[c + d*x^n])*(d*x)^m,x]
```

```
[Out] (F^a*(d*x)^(1 + m)*(c + d*x^n)^(b*Log[F])*Hypergeometric2F1[(1 + m)/n, -(b*
Log[F]), (1 + m + n)/n, -((d*x^n)/c)])/(d*(1 + m)*(1 + (d*x^n)/c)^(b*Log[F]
))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rule 365

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[(a^
IntPart[p]*(a + b*x^n)^FracPart[p])/(1 + (b*x^n)/a)^FracPart[p], Int[(c*x)^
m*(1 + (b*x^n)/a)^p, x], x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0]
 &&  !(ILtQ[p, 0] || GtQ[a, 0])
```

Rule 2274

```
Int[(u_.)*(F_)^((a_.)*(Log[z_]*(b_.) + (v_.))), x_Symbol] :> Int[u*F^(a*v)*
z^(a*b*Log[F]), x] /; FreeQ[{F, a, b}, x]
```

Rubi steps

$$\begin{aligned}\int F^{a+b\log(c+dx^n)}(dx)^m\,dx &= \int F^a(dx)^m\,(c+dx^n)^{b\log(F)}\,dx\\ &= F^a\int(dx)^m\,(c+dx^n)^{b\log(F)}\,dx\\ &= \left(F^a\,(c+dx^n)^{b\log(F)}\left(1+\frac{dx^n}{c}\right)^{-b\log(F)}\right)\int(dx)^m\left(1+\frac{dx^n}{c}\right)^{b\log(F)}\,dx\\ &= \frac{F^a(dx)^{1+m}\,(c+dx^n)^{b\log(F)}\left(1+\frac{dx^n}{c}\right)^{-b\log(F)}\,{}_2F_1\left(\frac{1+m}{n},-b\log(F);\frac{1+m+n}{n};-\frac{dx^n}{c}\right)}{d(1+m)}\end{aligned}$$

Mathematica [A] time = 0.17, size = 94, normalized size = 1.22

$$-\frac{x(dx)^m\,(c+dx^n)\left(-\frac{dx^n}{c}\right)^{-\frac{m+1}{n}}F^{a+b\log(c+dx^n)}\,{}_2F_1\left(1-\frac{m+1}{n},b\log(F)+1;b\log(F)+2;\frac{dx^n}{c}+1\right)}{cn(b\log(F)+1)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*Log[c + d*x^n])*(d*x)^m,x]
```

```
[Out] -((F^(a + b*Log[c + d*x^n])*x*(d*x)^m*(c + d*x^n)*Hypergeometric2F1[1 - (1
+ m)/n, 1 + b*Log[F], 2 + b*Log[F], 1 + (d*x^n)/c])/(c*n*(-((d*x^n)/c))^((1
 + m)/n)*(1 + b*Log[F])))
```

fricas [F] time = 0.47, size = 0, normalized size = 0.00

$$\text{integral}\left((dx)^m\,F^{b\log(dx^n+c)+a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*log(c+d*x^n))*(d*x)^m,x, algorithm="fricas")
```

```
[Out] integral((d*x)^m*F^(b*log(d*x^n + c) + a), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int(dx)^m\,F^{b\log(dx^n+c)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*log(c+d*x^n))*(d*x)^m,x, algorithm="giac")
[Out] integrate((d*x)^m*F^(b*log(d*x^n + c) + a), x)
```

maple [F] time = 0.08, size = 0, normalized size = 0.00

$$\int F^{b\ln(d\,x^n+c)+a}\,(dx)^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(b*ln(d*x^n+c)+a)*(d*x)^m,x)
[Out] int(F^(b*ln(d*x^n+c)+a)*(d*x)^m,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (dx)^m\,F^{b\log(dx^n+c)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(a+b*log(c+d*x^n))*(d*x)^m,x, algorithm="maxima")
[Out] integrate((d*x)^m*F^(b*log(d*x^n + c) + a), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int F^{a+b\,\ln(c+d\,x^n)}\,(d\,x)^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*log(c + d*x^n))*(d*x)^m,x)
[Out] int(F^(a + b*log(c + d*x^n))*(d*x)^m, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(a+b*ln(c+d*x**n))*(d*x)**m,x)
[Out] Timed out
```

3.586 $\int e^{\log^2((d+ex)^n)}(d+ex)^m\,dx$

Optimal. Leaf size=76

$$\frac{\sqrt{\pi}\,e^{-\frac{(m+1)^2}{4n^2}}(d+ex)^{m+1}\left((d+ex)^n\right)^{-\frac{m+1}{n}}\operatorname{erfi}\left(\frac{2n\log((d+ex)^n)+m+1}{2n}\right)}{2en}$$

```
[Out] 1/2*(e*x+d)^(1+m)*erfi(1/2*(1+m+2*n*ln((e*x+d)^n))/n)*Pi^(1/2)/e/exp(1/4*(1
+m)^2/n^2)/n/(((e*x+d)^n)^((1+m)/n))
```

Rubi [A] time = 0.16, antiderivative size = 76, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.150, Rules used = {2276, 2234, 2204}

$$\frac{\sqrt{\pi}\,e^{-\frac{(m+1)^2}{4n^2}}(d+ex)^{m+1}\left((d+ex)^n\right)^{-\frac{m+1}{n}}\operatorname{Erfi}\left(\frac{2n\log((d+ex)^n)+m+1}{2n}\right)}{2en}$$

Antiderivative was successfully verified.

```
[In] Int[E^Log[(d + e*x)^n]^2*(d + e*x)^m,x]
```

```
[Out] (Sqrt[Pi]*(d + e*x)^(1 + m)*Erfi[(1 + m + 2*n*Log[(d + e*x)^n])/(2*n)])/(2*
e*E^((1 + m)^2/(4*n^2))*n*((d + e*x)^n)^((1 + m)/n))
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2234

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2276

```
Int[(F_)^(((a_.) + Log[(c_.)*(x_)^(n_.)]^2*(b_.))*(d_.))*((e_.)*(x_))^(m_.)
, x_Symbol] :> Dist[(e*x)^(m + 1)/(e*n*(c*x^n)^((m + 1)/n)), Subst[Int[E^(a
*d*Log[F] + ((m + 1)*x)/n + b*d*Log[F]*x^2), x], x, Log[c*x^n]], x] /; Free
Q[{F, a, b, c, d, e, m, n}, x]
```

Rubi steps

$$\int e^{\log^2((d+ex)^n)}(d+ex)^m\,dx = \frac{\text{Subst}\left(\int e^{\log^2(x^n)}x^m\,dx, x, d+ex\right)}{e}$$
$$= \frac{\left((d+ex)^{1+m}\left((d+ex)^n\right)^{-\frac{1+m}{n}}\right)\text{Subst}\left(\int e^{\frac{(1+m)x}{n}+x^2}\,dx, x, \log\left((d+ex)^n\right)\right)}{en}$$
$$= \frac{\left(e^{-\frac{(1+m)^2}{4n^2}}(d+ex)^{1+m}\left((d+ex)^n\right)^{-\frac{1+m}{n}}\right)\text{Subst}\left(\int e^{\frac{1}{4}\left(\frac{1+m}{n}+2x\right)^2}\,dx, x, \log\left((d+ex)^n\right)\right)}{en}$$
$$= \frac{e^{-\frac{(1+m)^2}{4n^2}}\sqrt{\pi}\,(d+ex)^{1+m}\left((d+ex)^n\right)^{-\frac{1+m}{n}}\,\text{erfi}\left(\frac{1+m+2n\log((d+ex)^n)}{2n}\right)}{2en}$$

Mathematica [F] time = 0.09, size = 0, normalized size = 0.00

$$\int e^{\log^2((d+ex)^n)}(d+ex)^m\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[E^Log[(d + e*x)^n]^2*(d + e*x)^m,x]
[Out] Integrate[E^Log[(d + e*x)^n]^2*(d + e*x)^m, x]
```

fricas [A] time = 0.43, size = 55, normalized size = 0.72

$$\frac{\sqrt{\pi}\sqrt{n^2}\,\text{erfi}\left(\frac{\left(2n^2\log(ex+d)+m+1\right)\sqrt{n^2}}{2n^2}\right)e^{\left(-\frac{m^2+2m+1}{4n^2}\right)}}{2en}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(log((e*x+d)^n)^2)*(e*x+d)^m,x, algorithm="fricas")
[Out] 1/2*sqrt(pi)*sqrt(n^2)*erfi(1/2*(2*n^2*log(e*x + d) + m + 1)*sqrt(n^2)/n^2)
*e^(-1/4*(m^2 + 2*m + 1)/n^2)/(e*n)
```

giac [A] time = 0.27, size = 56, normalized size = 0.74

$$-\frac{\sqrt{\pi}\,i\,\text{erf}\left(in\log(xe+d)+\frac{im}{2n}+\frac{i}{2n}\right)e^{\left(-\frac{m^2}{4n^2}-\frac{m}{2n^2}-\frac{1}{4n^2}-1\right)}}{2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(log((e*x+d)^n)^2)*(e*x+d)^m,x, algorithm="giac")
```

```
[Out] -1/2*sqrt(pi)*i*erf(i*n*log(x*e + d) + 1/2*i*m/n + 1/2*i/n)*e^(-1/4*m^2/n^2
 - 1/2*m/n^2 - 1/4/n^2 - 1)/n
```

maple [F] time = 0.11, size = 0, normalized size = 0.00

$$\int \left(ex+d\right)^{m} {\mathrm e}^{\ln\left(\left(ex+d\right)^{n}\right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(ln((e*x+d)^n)^2)*(e*x+d)^m,x)
```

```
[Out] int(exp(ln((e*x+d)^n)^2)*(e*x+d)^m,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (ex+d)^m e^{\left(\log\left((ex+d)^n\right)^2\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(log((e*x+d)^n)^2)*(e*x+d)^m,x, algorithm="maxima")
```

```
[Out] integrate((e*x + d)^m*e^(log((e*x + d)^n)^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int {\mathrm{e}}^{{\ln\left({\left(d+e\,x\right)}^n\right)}^2}\,{\left(d+e\,x\right)}^m \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(log((d + e*x)^n)^2)*(d + e*x)^m,x)
```

```
[Out] int(exp(log((d + e*x)^n)^2)*(d + e*x)^m, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d + ex\right)^{m} e^{\log{\left(\left(d + ex\right)^{n} \right)}^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(ln((e*x+d)**n)**2)*(e*x+d)**m,x)
```

```
[Out] Integral((d + e*x)**m*exp(log((d + e*x)**n)**2), x)
```

3.587 $\int F^{f\left(a+b\log^2(c(d+ex)^n)\right)}(dg+egx)^m\,dx$

Optimal. Leaf size=137

$$\frac{\sqrt{\pi}\,F^{af}(dg+egx)^{m+1}e^{-\frac{(m+1)^2}{4bfn^2\log(F)}}\,(c(d+ex)^n)^{-\frac{m+1}{n}}\,\mathrm{erfi}\left(\frac{2bfn\log(F)\log(c(d+ex)^n)+m+1}{2\sqrt{b}\,\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e\sqrt{f}\,gn\sqrt{\log(F)}}$$

```
[Out] 1/2*F^(a*f)*(e*g*x+d*g)^(1+m)*erfi(1/2*(1+m+2*b*f*n*ln(F)*ln(c*(e*x+d)^n))/
n/b^(1/2)/f^(1/2)/ln(F)^(1/2))*Pi^(1/2)/e/exp(1/4*(1+m)^2/b/f/n^2/ln(F))/g/
n/((c*(e*x+d)^n)^((1+m)/n))/b^(1/2)/f^(1/2)/ln(F)^(1/2)
```

Rubi [A] time = 0.39, antiderivative size = 136, normalized size of antiderivative = 0.99, number of steps used = 4, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {2276, 2234, 2204}

$$\frac{\sqrt{\pi}\,F^{af}(g(d+ex))^{m+1}e^{-\frac{(m+1)^2}{4bfn^2\log(F)}}\,(c(d+ex)^n)^{-\frac{m+1}{n}}\,\mathrm{Erfi}\left(\frac{2bfn\log(F)\log(c(d+ex)^n)+m+1}{2\sqrt{b}\,\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e\sqrt{f}\,gn\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n]^2))*(d*g + e*g*x)^m,x]
```

```
[Out] (F^(a*f)*Sqrt[Pi]*(g*(d + e*x))^(1 + m)*Erfi[(1 + m + 2*b*f*n*Log[F]*Log[c*
(d + e*x)^n])/(2*Sqrt[b]*Sqrt[f]*n*Sqrt[Log[F]])])/(2*Sqrt[b]*e*E^((1 + m)^
2/(4*b*f*n^2*Log[F]))*Sqrt[f]*g*n*(c*(d + e*x)^n)^((1 + m)/n)*Sqrt[Log[F]])
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2234

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2276

```
Int[(F_)^(((a_.) + Log[(c_.)*(x_)^(n_.)]^2*(b_.))*(d_.))*((e_.)*(x_))^(m_.)
, x_Symbol] :> Dist[(e*x)^(m + 1)/(e*n*(c*x^n)^((m + 1)/n)), Subst[Int[E^(a
*d*Log[F] + ((m + 1)*x)/n + b*d*Log[F]*x^2), x], x, Log[c*x^n]], x] /; Free
```

```
Q[{F, a, b, c, d, e, m, n}, x]
```

Rubi steps

$$\int F^{f\left(a+b\log^2(c(d+ex)^n)\right)}(dg+egx)^m\,dx = \frac{\operatorname{Subst}\left(\int F^{f\left(a+b\log^2(cx^n)\right)}(gx)^m\,dx, x, d+ex\right)}{e}$$

$$= \frac{\left((g(d+ex))^{1+m}\left(c(d+ex)^n\right)^{-\frac{1+m}{n}}\right)\operatorname{Subst}\left(\int e^{\frac{(1+m)x}{n}+af\log(F)+bfx^2\log(F)}\,dx, x, \right.}{egn}$$

$$= \frac{\left(e^{-\frac{(1+m)^2}{4bfn^2\log(F)}}F^{af}(g(d+ex))^{1+m}\left(c(d+ex)^n\right)^{-\frac{1+m}{n}}\right)\operatorname{Subst}\left(\int e^{\frac{\left(\frac{1+m}{n}+2bfx\log(F)\right)^2}{4bf\log(F)}}\right.}{egn}$$

$$= \frac{e^{-\frac{(1+m)^2}{4bfn^2\log(F)}}F^{af}\sqrt{\pi}\,(g(d+ex))^{1+m}\left(c(d+ex)^n\right)^{-\frac{1+m}{n}}\operatorname{erfi}\left(\frac{1+m+2bfn\log(F)\log(c(}{2\sqrt{b}\sqrt{f}\,n\sqrt{\log(F}}\right.}{2\sqrt{b}\,e\sqrt{f}\,gn\sqrt{\log(F)}}$$

Mathematica [F] time = 0.17, size = 0, normalized size = 0.00

$$\int F^{f\left(a+b\log^2(c(d+ex)^n)\right)}(dg+egx)^m\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n]^2))*(d*g + e*g*x)^m,x]
[Out] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n]^2))*(d*g + e*g*x)^m, x]
```

fricas [A] time = 0.42, size = 143, normalized size = 1.04

$$-\frac{\sqrt{\pi}\sqrt{-bfn^2\log(F)}\operatorname{erf}\left(\frac{\left(2bfn^2\log(ex+d)\log(F)+2bfn\log(F)\log(c)+m+1\right)\sqrt{-bfn^2\log(F)}}{2bfn^2\log(F)}\right)e^{\left(\frac{4abf^2n^2\log(F)^2+4bfmn^2\log(F)\log(g)-4\left(bfm+\right.}{4bfn^2\log(F)}\right.}}{2en}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))*(e*g*x+d*g)^m,x, algorithm="fricas
")
[Out] -1/2*sqrt(pi)*sqrt(-b*f*n^2*log(F))*erf(1/2*(2*b*f*n^2*log(e*x + d)*log(F)
+ 2*b*f*n*log(F)*log(c) + m + 1)*sqrt(-b*f*n^2*log(F))/(b*f*n^2*log(F)))*e^
```

```
(1/4*(4*a*b*f^2*n^2*log(F)^2 + 4*b*f*m*n^2*log(F)*log(g) - 4*(b*f*m + b*f)*
n*log(F)*log(c) - m^2 - 2*m - 1)/(b*f*n^2*log(F)))/(e*n)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(egx + dg\right)^{m} F^{\left(b \log\left(\left(ex+d\right)^{n} c\right)^{2} + a\right)f}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))*(e*g*x+d*g)^m,x, algorithm="giac")
```

```
[Out] integrate((e*g*x + d*g)^m*F^((b*log((e*x + d)^n*c)^2 + a)*f), x)
```

maple [F] time = 84.22, size = 0, normalized size = 0.00

$$\int F^{\left(b \ln\left(c\left(ex+d\right)^{n}\right)^{2} + a\right)f} \left(egx + dg\right)^{m}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a+b*ln(c*(e*x+d)^n)^2))*(e*g*x+d*g)^m,x)
```

```
[Out] int(F^(f*(a+b*ln(c*(e*x+d)^n)^2))*(e*g*x+d*g)^m,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(egx + dg\right)^{m} F^{\left(b \log\left(\left(ex+d\right)^{n} c\right)^{2} + a\right)f}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))*(e*g*x+d*g)^m,x, algorithm="maxima
")
```

```
[Out] integrate((e*g*x + d*g)^m*F^((b*log((e*x + d)^n*c)^2 + a)*f), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \mathrm{e}^{f\,\ln(F)\,\left(b\,\ln\left(c\,(d+e\,x)^{n}\right)^{2}+a\right)}\,\left(d\,g+e\,g\,x\right)^{m}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n)^2))*(d*g + e*g*x)^m,x)
```

```
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n)^2))*(d*g + e*g*x)^m, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{f\left(a+b\log\left(c(d+ex)^n\right)^2\right)}\left(g\left(d+ex\right)\right)^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n)**2))*(e*g*x+d*g)**m,x)
```

```
[Out] Integral(F**(f*(a + b*log(c*(d + e*x)**n)**2))*(g*(d + e*x))**m, x)
```

3.588 $\int F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}(dg+egx)^2\,dx$

Optimal. Leaf size=123

$$\frac{\sqrt{\pi}\,g^2F^{af}(d+ex)^3e^{-\frac{9}{4bfn^2\log(F)}}\left(c(d+ex)^n\right)^{-3/n}\operatorname{erfi}\left(\frac{2bfn\log(F)\log\left(c(d+ex)^n\right)+3}{2\sqrt{b}\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e\sqrt{f}\,n\sqrt{\log(F)}}$$

```
[Out] 1/2*F^(a*f)*g^2*(e*x+d)^3*erfi(1/2*(3+2*b*f*n*ln(F)*ln(c*(e*x+d)^n))/n/b^(1
/2)/f^(1/2)/ln(F)^(1/2))*Pi^(1/2)/e/exp(9/4/b/f/n^2/ln(F))/n/((c*(e*x+d)^n)
^(3/n))/b^(1/2)/f^(1/2)/ln(F)^(1/2)
```

Rubi [A] time = 0.25, antiderivative size = 123, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.129, Rules used = {12, 2276, 2234, 2204}

$$\frac{\sqrt{\pi}\,g^2F^{af}(d+ex)^3e^{-\frac{9}{4bfn^2\log(F)}}\left(c(d+ex)^n\right)^{-3/n}\text{Erfi}\left(\frac{2bfn\log(F)\log\left(c(d+ex)^n\right)+3}{2\sqrt{b}\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e\sqrt{f}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n]^2))*(d*g + e*g*x)^2,x]
```

```
[Out] (F^(a*f)*g^2*Sqrt[Pi]*(d + e*x)^3*Erfi[(3 + 2*b*f*n*Log[F]*Log[c*(d + e*x)^
n])/(2*Sqrt[b]*Sqrt[f]*n*Sqrt[Log[F]])])/(2*Sqrt[b]*e*E^(9/(4*b*f*n^2*Log[F
]))*Sqrt[f]*n*(c*(d + e*x)^n)^(3/n)*Sqrt[Log[F]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2234

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2276

```
Int[(F_)^(((a_.) + Log[(c_.)*(x_)^(n_.)]^2*(b_.))*(d_.))*((e_.)*(x_))^(m_.)
, x_Symbol] :> Dist[(e*x)^(m + 1)/(e*n*(c*x^n)^((m + 1)/n)), Subst[Int[E^(a
*d*Log[F] + ((m + 1)*x)/n + b*d*Log[F]*x^2), x], x, Log[c*x^n]], x] /; Free
Q[{F, a, b, c, d, e, m, n}, x]
```

Rubi steps

$$\int F^{f\left(a+b\log^2(c(d+ex)^n)\right)}(dg+egx)^2\,dx = \frac{\text{Subst}\left(\int F^{f\left(a+b\log^2(cx^n)\right)}g^2x^2\,dx,x,d+ex\right)}{e}$$
$$= \frac{g^2\,\text{Subst}\left(\int F^{f\left(a+b\log^2(cx^n)\right)}x^2\,dx,x,d+ex\right)}{e}$$
$$= \frac{\left(g^2(d+ex)^3\left(c(d+ex)^n\right)^{-3/n}\right)\text{Subst}\left(\int e^{\frac{3x}{n}+af\log(F)+bfx^2\log(F)}\,dx,x,\log\left(c(d\right.\right.}{en}$$
$$= \frac{\left(e^{-\frac{9}{4bfn^2\log(F)}}F^{af}g^2(d+ex)^3\left(c(d+ex)^n\right)^{-3/n}\right)\text{Subst}\left(\int e^{\frac{\left(\frac{3}{n}+2bfx\log(F)\right)^2}{4bf\log(F)}}\,dx,x,\text{l}\right.}{en}$$
$$= \frac{e^{-\frac{9}{4bfn^2\log(F)}}F^{af}g^2\sqrt{\pi}\,(d+ex)^3\left(c(d+ex)^n\right)^{-3/n}\text{erfi}\left(\frac{3+2bfn\log(F)\log(c(d+ex)^n)}{2\sqrt{b}\,\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e\sqrt{f}\,n\sqrt{\log(F)}}$$

Mathematica [A] time = 0.25, size = 123, normalized size = 1.00

$$\frac{\sqrt{\pi}\,g^2F^{af}(d+ex)^3e^{-\frac{9}{4bfn^2\log(F)}}\left(c(d+ex)^n\right)^{-3/n}\text{erfi}\left(\frac{2bfn\log(F)\log(c(d+ex)^n)+3}{2\sqrt{b}\,\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e\sqrt{f}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n]^2))*(d*g + e*g*x)^2,x]
```

```
[Out] (F^(a*f)*g^2*Sqrt[Pi]*(d + e*x)^3*Erfi[(3 + 2*b*f*n*Log[F]*Log[c*(d + e*x)^
n])/(2*Sqrt[b]*Sqrt[f]*n*Sqrt[Log[F]])])/(2*Sqrt[b]*e*E^(9/(4*b*f*n^2*Log[F
]))*Sqrt[f]*n*(c*(d + e*x)^n)^(3/n)*Sqrt[Log[F]])
```

fricas [A] time = 0.43, size = 119, normalized size = 0.97

$$-\frac{\sqrt{\pi}\sqrt{-bfn^2\log(F)}\,g^2\operatorname{erf}\left(\frac{\left(2\,bfn^2\log(ex+d)\log(F)+2\,bfn\log(F)\log(c)+3\right)\sqrt{-bfn^2\log(F)}}{2\,bfn^2\log(F)}\right)e^{\left(\frac{4\,abf^2n^2\log(F)^2-12\,bfn\log(F)\log(c)-9}{4\,bfn^2\log(F)}\right)}}{2\,en}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))*(e*g*x+d*g)^2,x, algorithm="fricas
")
```

```
[Out] -1/2*sqrt(pi)*sqrt(-b*f*n^2*log(F))*g^2*erf(1/2*(2*b*f*n^2*log(e*x + d)*log
(F) + 2*b*f*n*log(F)*log(c) + 3)*sqrt(-b*f*n^2*log(F))/(b*f*n^2*log(F)))*e^
(1/4*(4*a*b*f^2*n^2*log(F)^2 - 12*b*f*n*log(F)*log(c) - 9)/(b*f*n^2*log(F))
)/(e*n)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\left(egx+dg\right)^2F^{\left(b\log\left(\left(ex+d\right)^nc\right)^2+a\right)f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))*(e*g*x+d*g)^2,x, algorithm="giac")
```

```
[Out] integrate((e*g*x + d*g)^2*F^((b*log((e*x + d)^n*c)^2 + a)*f), x)
```

maple [F] time = 0.36, size = 0, normalized size = 0.00

$$\int\left(egx+dg\right)^2F^{\left(b\ln\left(c\left(ex+d\right)^n\right)^2+a\right)f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^((b*ln(c*(e*x+d)^n)^2+a)*f)*(e*g*x+d*g)^2,x)
```

```
[Out] int(F^((b*ln(c*(e*x+d)^n)^2+a)*f)*(e*g*x+d*g)^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\left(egx+dg\right)^2F^{\left(b\log\left(\left(ex+d\right)^nc\right)^2+a\right)f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))*(e*g*x+d*g)^2,x, algorithm="maxima
")
```

```
[Out] integrate((e*g*x + d*g)^2*F^((b*log((e*x + d)^n*c)^2 + a)*f), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int e^{f\,\ln(F)\,\left(b\,\ln\left(c\,(d+e\,x)^n\right)^2+a\right)}\,\left(d\,g+e\,g\,x\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n)^2))*(d*g + e*g*x)^2,x)
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n)^2))*(d*g + e*g*x)^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n)**2))*(e*g*x+d*g)**2,x)
[Out] Timed out
```

3.589 $\int F^{f\left(a+b\log^2(c(d+ex)^n)\right)}(dg+egx)\,dx$

Optimal. Leaf size=115

$$\frac{\sqrt{\pi}\,gF^{af}(d+ex)^2e^{-\frac{1}{bfn^2\log(F)}}\,(c(d+ex)^n)^{-2/n}\,\mathrm{erfi}\left(\frac{bfn\log(F)\log(c(d+ex)^n)+1}{\sqrt{b}\,\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e\sqrt{f}\,n\sqrt{\log(F)}}$$

```
[Out] 1/2*F^(a*f)*g*(e*x+d)^2*erfi((1+b*f*n*ln(F)*ln(c*(e*x+d)^n))/n/b^(1/2)/f^(1
/2)/ln(F)^(1/2))*Pi^(1/2)/e/exp(1/b/f/n^2/ln(F))/n/((c*(e*x+d)^n)^(2/n))/b^
(1/2)/f^(1/2)/ln(F)^(1/2)
```

Rubi [A] time = 0.21, antiderivative size = 115, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.138, Rules used = {12, 2276, 2234, 2204}

$$\frac{\sqrt{\pi}\,gF^{af}(d+ex)^2e^{-\frac{1}{bfn^2\log(F)}}\,(c(d+ex)^n)^{-2/n}\,\mathrm{Erfi}\left(\frac{bfn\log(F)\log(c(d+ex)^n)+1}{\sqrt{b}\,\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e\sqrt{f}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n]^2))*(d*g + e*g*x),x]
```

```
[Out] (F^(a*f)*g*Sqrt[Pi]*(d + e*x)^2*Erfi[(1 + b*f*n*Log[F]*Log[c*(d + e*x)^n])/
(Sqrt[b]*Sqrt[f]*n*Sqrt[Log[F]])])/(2*Sqrt[b]*e*E^(1/(b*f*n^2*Log[F]))*Sqrt
[f]*n*(c*(d + e*x)^n)^(2/n)*Sqrt[Log[F]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2234

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2276

```
Int[(F_)^(((a_.) + Log[(c_.)*(x_)^(n_.)]^2*(b_.))*(d_.))*((e_.)*(x_))^(m_.)
, x_Symbol] :> Dist[(e*x)^(m + 1)/(e*n*(c*x^n)^((m + 1)/n)), Subst[Int[E^(a
*d*Log[F] + ((m + 1)*x)/n + b*d*Log[F]*x^2), x], x, Log[c*x^n]], x] /; Free
Q[{F, a, b, c, d, e, m, n}, x]
```

Rubi steps

$$\int F^{f\left(a+b\log^2(c(d+ex)^n)\right)}(dg+egx)\,dx = \frac{\text{Subst}\left(\int F^{f\left(a+b\log^2(cx^n)\right)}gx\,dx,x,d+ex\right)}{e}$$
$$= \frac{g\,\text{Subst}\left(\int F^{f\left(a+b\log^2(cx^n)\right)}x\,dx,x,d+ex\right)}{e}$$
$$= \frac{\left(g(d+ex)^2\left(c(d+ex)^n\right)^{-2/n}\right)\text{Subst}\left(\int e^{\frac{2x}{n}+af\log(F)+bfx^2\log(F)}\,dx,x,\log\left(c(d+\right.\right.}{en}$$
$$= \frac{\left(e^{-\frac{1}{bfn^2\log(F)}}F^{af}g(d+ex)^2\left(c(d+ex)^n\right)^{-2/n}\right)\text{Subst}\left(\int e^{\frac{\left(\frac{2}{n}+2bfx\log(F)\right)^2}{4bf\log(F)}}\,dx,x,\log\right.}{en}$$
$$= \frac{e^{-\frac{1}{bfn^2\log(F)}}F^{af}g\sqrt{\pi}(d+ex)^2\left(c(d+ex)^n\right)^{-2/n}\text{erfi}\left(\frac{1+bfn\log(F)\log(c(d+ex)^n)}{\sqrt{b}\sqrt{f}n\sqrt{\log(F)}}\right)}{2\sqrt{b}e\sqrt{f}n\sqrt{\log(F)}}$$

Mathematica [A] time = 0.56, size = 115, normalized size = 1.00

$$\frac{\sqrt{\pi}gF^{af}(d+ex)^2e^{-\frac{1}{bfn^2\log(F)}}\left(c(d+ex)^n\right)^{-2/n}\text{erfi}\left(\frac{bfn\log(F)\log(c(d+ex)^n)+1}{\sqrt{b}\sqrt{f}n\sqrt{\log(F)}}\right)}{2\sqrt{b}e\sqrt{f}n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n]^2))*(d*g + e*g*x),x]
```

```
[Out] (F^(a*f)*g*Sqrt[Pi]*(d + e*x)^2*Erfi[(1 + b*f*n*Log[F]*Log[c*(d + e*x)^n])/
(Sqrt[b]*Sqrt[f]*n*Sqrt[Log[F]])])/(2*Sqrt[b]*e*E^(1/(b*f*n^2*Log[F]))*Sqrt
[f]*n*(c*(d + e*x)^n)^(2/n)*Sqrt[Log[F]])
```

fricas [A] time = 0.42, size = 112, normalized size = 0.97

$$-\frac{\sqrt{\pi}\sqrt{-bfn^2\log(F)}\,g\,\mathrm{erf}\left(\frac{\left(bfn^2\log(ex+d)\log(F)+bfn\log(F)\log(c)+1\right)\sqrt{-bfn^2\log(F)}}{bfn^2\log(F)}\right)e^{\left(\frac{abf^2n^2\log(F)^2-2\,bfn\log(F)\log(c)-1}{bfn^2\log(F)}\right)}}{2\,en}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))*(e*g*x+d*g),x, algorithm="fricas")
```

```
[Out] -1/2*sqrt(pi)*sqrt(-b*f*n^2*log(F))*g*erf((b*f*n^2*log(e*x + d)*log(F) + b*
f*n*log(F)*log(c) + 1)*sqrt(-b*f*n^2*log(F))/(b*f*n^2*log(F)))*e^((a*b*f^2*
n^2*log(F)^2 - 2*b*f*n*log(F)*log(c) - 1)/(b*f*n^2*log(F)))/(e*n)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (egx+dg)F^{\left(b\log\left((ex+d)^n c\right)^2+a\right)f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))*(e*g*x+d*g),x, algorithm="giac")
```

```
[Out] integrate((e*g*x + d*g)*F^((b*log((e*x + d)^n*c)^2 + a)*f), x)
```

maple [F] time = 0.39, size = 0, normalized size = 0.00

$$\int \left(egx+dg\right)F^{\left(b\ln\left(c(ex+d)^n\right)^2+a\right)f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^((b*ln(c*(e*x+d)^n)^2+a)*f)*(e*g*x+d*g),x)
```

```
[Out] int(F^((b*ln(c*(e*x+d)^n)^2+a)*f)*(e*g*x+d*g),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (egx+dg)F^{\left(b\log\left((ex+d)^n c\right)^2+a\right)f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))*(e*g*x+d*g),x, algorithm="maxima")
```

```
[Out] integrate((e*g*x + d*g)*F^((b*log((e*x + d)^n*c)^2 + a)*f), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int e^{f\ln(F)\left(b\ln\left(c\,(d+e\,x)^n\right)^2+a\right)}\,\left(d\,g+e\,g\,x\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n)^2))*(d*g + e*g*x),x)
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n)^2))*(d*g + e*g*x), x)
```

sympy [A] time = 110.48, size = 838, normalized size = 7.29

$$\begin{cases} -\frac{F^{af}F^{bf\log(c)^2}F^{bfn^2\log(d+ex)^2}F^{2bfn\log(c)\log(d+ex)}bd^2fgn^2\log(F)\log(d+ex)}{2e} - \frac{F^{af}F^{bf\log(c)^2}F^{bfn^2\log(d+ex)^2}F^{2bfn\log(c)\log(d+ex)}bd^2fgn^2\log(F)}{2e} \\ F^{f\left(a+b\log(cd^n)^2\right)}dgx \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n)**2))*(e*g*x+d*g),x)
[Out] Piecewise((-F**(a*f)*F**(b*f*log(c)**2)*F**(b*f*n**2*log(d + e*x)**2)*F**(2
*b*f*n*log(c)*log(d + e*x))*b*d**2*f*g*n**2*log(F)*log(d + e*x)/(2*e) - F**
(a*f)*F**(b*f*log(c)**2)*F**(b*f*n**2*log(d + e*x)**2)*F**(2*b*f*n*log(c)*l
og(d + e*x))*b*d**2*f*g*n**2*log(F)/(2*e) - F**(a*f)*F**(b*f*log(c)**2)*F**
(b*f*n**2*log(d + e*x)**2)*F**(2*b*f*n*log(c)*log(d + e*x))*b*d**2*f*g*n*lo
g(F)*log(c)/(2*e) - F**(a*f)*F**(b*f*log(c)**2)*F**(b*f*n**2*log(d + e*x)**
2)*F**(2*b*f*n*log(c)*log(d + e*x))*b*d*f*g*n**2*x*log(F)*log(d + e*x) + F*
*(a*f)*F**(b*f*log(c)**2)*F**(b*f*n**2*log(d + e*x)**2)*F**(2*b*f*n*log(c)*
log(d + e*x))*b*d*f*g*n**2*x*log(F)/2 - F**(a*f)*F**(b*f*log(c)**2)*F**(b*f
*n**2*log(d + e*x)**2)*F**(2*b*f*n*log(c)*log(d + e*x))*b*d*f*g*n*x*log(F)*
log(c) - F**(a*f)*F**(b*f*log(c)**2)*F**(b*f*n**2*log(d + e*x)**2)*F**(2*b*
f*n*log(c)*log(d + e*x))*b*e*f*g*n**2*x**2*log(F)*log(d + e*x)/2 + F**(a*f)
*F**(b*f*log(c)**2)*F**(b*f*n**2*log(d + e*x)**2)*F**(2*b*f*n*log(c)*log(d
+ e*x))*b*e*f*g*n**2*x**2*log(F)/4 - F**(a*f)*F**(b*f*log(c)**2)*F**(b*f*n*
*2*log(d + e*x)**2)*F**(2*b*f*n*log(c)*log(d + e*x))*b*e*f*g*n*x**2*log(F)*
log(c)/2 + F**(a*f)*F**(b*f*log(c)**2)*F**(b*f*n**2*log(d + e*x)**2)*F**(2*
b*f*n*log(c)*log(d + e*x))*d**2*g/(2*e) + F**(a*f)*F**(b*f*log(c)**2)*F**(b
*f*n**2*log(d + e*x)**2)*F**(2*b*f*n*log(c)*log(d + e*x))*d*g*x + F**(a*f)*
F**(b*f*log(c)**2)*F**(b*f*n**2*log(d + e*x)**2)*F**(2*b*f*n*log(c)*log(d +
 e*x))*e*g*x**2/2, Ne(e, 0)), (F**(f*(a + b*log(c*d**n)**2))*d*g*x, True))
```

3.590 $\int F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}\,dx$

Optimal. Leaf size=118

$$\frac{\sqrt{\pi}\,F^{af}(d+ex)e^{-\frac{1}{4bfn^2\log(F)}}\left(c(d+ex)^n\right)^{-1/n}\operatorname{erfi}\left(\frac{2bfn\log(F)\log\left(c(d+ex)^n\right)+1}{2\sqrt{b}\,\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e\sqrt{f}\,n\sqrt{\log(F)}}$$

```
[Out] 1/2*F^(a*f)*(e*x+d)*erfi(1/2*(1+2*b*f*n*ln(F)*ln(c*(e*x+d)^n))/n/b^(1/2)/f^
(1/2)/ln(F)^(1/2))*Pi^(1/2)/e/exp(1/4/b/f/n^2/ln(F))/n/((c*(e*x+d)^n)^(1/n)
)/b^(1/2)/f^(1/2)/ln(F)^(1/2)
```

Rubi [A] time = 0.13, antiderivative size = 118, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.150, Rules used = {2275, 2234, 2204}

$$\frac{\sqrt{\pi}\,F^{af}(d+ex)e^{-\frac{1}{4bfn^2\log(F)}}\left(c(d+ex)^n\right)^{-1/n}\operatorname{Erfi}\left(\frac{2bfn\log(F)\log\left(c(d+ex)^n\right)+1}{2\sqrt{b}\,\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e\sqrt{f}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n]^2)),x]
```

```
[Out] (F^(a*f)*Sqrt[Pi]*(d + e*x)*Erfi[(1 + 2*b*f*n*Log[F]*Log[c*(d + e*x)^n])/(2
*Sqrt[b]*Sqrt[f]*n*Sqrt[Log[F]])])/(2*Sqrt[b]*e*E^(1/(4*b*f*n^2*Log[F]))*Sq
rt[f]*n*(c*(d + e*x)^n)^n^(-1)*Sqrt[Log[F]])
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2234

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2275

```
Int[(F_)^(((a_.) + Log[(c_.)*(x_)^(n_.)]^2*(b_.))*(d_.)), x_Symbol] :> Dist
[x/(n*(c*x^n)^(1/n)), Subst[Int[E^(a*d*Log[F] + x/n + b*d*Log[F]*x^2), x],
x, Log[c*x^n]], x] /; FreeQ[{F, a, b, c, d, n}, x]
```

Rubi steps

$$\int F^{f\left(a+b\log^2(c(d+ex)^n)\right)}\,dx = \frac{\text{Subst}\left(\int F^{f\left(a+b\log^2(cx^n)\right)}\,dx,x,d+ex\right)}{e}$$

$$= \frac{\left((d+ex)\left(c(d+ex)^n\right)^{-1/n}\right)\text{Subst}\left(\int e^{\frac{x}{n}+af\log(F)+bfx^2\log(F)}\,dx,x,\log\left(c(d+ex)^n\right)\right)}{en}$$

$$= \frac{\left(e^{-\frac{1}{4bfn^2\log(F)}}F^{af}(d+ex)\left(c(d+ex)^n\right)^{-1/n}\right)\text{Subst}\left(\int e^{\frac{\left(\frac{1}{n}+2bfx\log(F)\right)^2}{4bf\log(F)}}\,dx,x,\log\left(c(d+ex)^n\right)\right.}{en}$$

$$= \frac{e^{-\frac{1}{4bfn^2\log(F)}}F^{af}\sqrt{\pi}\,(d+ex)\left(c(d+ex)^n\right)^{-1/n}\text{erfi}\left(\frac{1+2bfn\log(F)\log(c(d+ex)^n)}{2\sqrt{b}\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e\sqrt{f}\,n\sqrt{\log(F)}}$$

Mathematica [A] time = 0.11, size = 118, normalized size = 1.00

$$\frac{\sqrt{\pi}\,F^{af}(d+ex)e^{-\frac{1}{4bfn^2\log(F)}}\left(c(d+ex)^n\right)^{-1/n}\text{erfi}\left(\frac{2bfn\log(F)\log(c(d+ex)^n)+1}{2\sqrt{b}\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e\sqrt{f}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n]^2)),x]
```

```
[Out] (F^(a*f)*Sqrt[Pi]*(d + e*x)*Erfi[(1 + 2*b*f*n*Log[F]*Log[c*(d + e*x)^n])/(2
*Sqrt[b]*Sqrt[f]*n*Sqrt[Log[F]])])/(2*Sqrt[b]*e*E^(1/(4*b*f*n^2*Log[F]))*Sq
rt[f]*n*(c*(d + e*x)^n)^n^(-1)*Sqrt[Log[F]])
```

fricas [A] time = 0.42, size = 116, normalized size = 0.98

$$-\frac{\sqrt{\pi}\sqrt{-bfn^2\log(F)}\,\text{erf}\left(\frac{\left(2\,bfn^2\log(ex+d)\log(F)+2\,bfn\log(F)\log(c)+1\right)\sqrt{-bfn^2\log(F)}}{2\,bfn^2\log(F)}\right)e^{\left(\frac{4\,abf^2n^2\log(F)^2-4\,bfn\log(F)\log(c)-1}{4\,bfn^2\log(F)}\right)}}{2\,en}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2)),x, algorithm="fricas")
```

```
[Out] -1/2*sqrt(pi)*sqrt(-b*f*n^2*log(F))*erf(1/2*(2*b*f*n^2*log(e*x + d)*log(F)
+ 2*b*f*n*log(F)*log(c) + 1)*sqrt(-b*f*n^2*log(F))/(b*f*n^2*log(F)))*e^(1/4
```

```
*(4*a*b*f^2*n^2*log(F)^2 - 4*b*f*n*log(F)*log(c) - 1)/(b*f*n^2*log(F)))/(e*
n)
```

giac [A] time = 0.40, size = 101, normalized size = 0.86

$$-\frac{\sqrt{\pi}F^{af}\operatorname{erf}\left(-\sqrt{-bf\log(F)}\,n\log(xe+d)-\sqrt{-bf\log(F)}\,\log(c)-\frac{\sqrt{-bf\log(F)}}{2\,bfn\log(F)}\right)e^{\left(-\frac{1}{4\,bfn^2\log(F)}-1\right)}}{2\,\sqrt{-bf\log(F)}\,c^{\left(\frac{1}{n}\right)}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2)),x, algorithm="giac")
[Out] -1/2*sqrt(pi)*F^(a*f)*erf(-sqrt(-b*f*log(F))*n*log(x*e + d) - sqrt(-b*f*log
(F))*log(c) - 1/2*sqrt(-b*f*log(F))/(b*f*n*log(F)))*e^(-1/4/(b*f*n^2*log(F)
) - 1)/(sqrt(-b*f*log(F))*c^(1/n)*n)
```

maple [F] time = 0.18, size = 0, normalized size = 0.00

$$\int F^{\left(b\ln\left(c(ex+d)^n\right)^2+a\right)f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^((b*ln(c*(e*x+d)^n)^2+a)*f),x)
[Out] int(F^((b*ln(c*(e*x+d)^n)^2+a)*f),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{\left(b\log\left((ex+d)^n c\right)^2+a\right)f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2)),x, algorithm="maxima")
[Out] integrate(F^((b*log((e*x + d)^n*c)^2 + a)*f), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int F^{b\,f\ln\left(c\,{(d+e\,x)}^n\right)^2}\,F^{a\,f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n)^2)),x)
```

```
[Out] int(F^(b*f*log(c*(d + e*x)^n)^2)*F^(a*f), x)
```

sympy [A] time = 29.71, size = 532, normalized size = 4.51

$$\begin{cases} -\frac{2F^{af}F^{bf\log(c)^2}F^{bfn^2\log(d+ex)^2}F^{2bfn\log(c)\log(d+ex)}bdfn^2\log(F)\log(d+ex)}{e} - \frac{2F^{af}F^{bf\log(c)^2}F^{bfn^2\log(d+ex)^2}F^{2bfn\log(c)\log(d+ex)}bdfn^2\log(F)}{e} - \\ F^{f\left(a+b\log(cd^n)^2\right)}x \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n)**2)),x)
```

```
[Out] Piecewise((-2*F**(a*f)*F**(b*f*log(c)**2)*F**(b*f*n**2*log(d + e*x)**2)*F**
(2*b*f*n*log(c)*log(d + e*x))*b*d*f*n**2*log(F)*log(d + e*x)/e - 2*F**(a*f)
*F**(b*f*log(c)**2)*F**(b*f*n**2*log(d + e*x)**2)*F**(2*b*f*n*log(c)*log(d
+ e*x))*b*d*f*n**2*log(F)/e - 2*F**(a*f)*F**(b*f*log(c)**2)*F**(b*f*n**2*lo
g(d + e*x)**2)*F**(2*b*f*n*log(c)*log(d + e*x))*b*d*f*n*log(F)*log(c)/e - 2
*F**(a*f)*F**(b*f*log(c)**2)*F**(b*f*n**2*log(d + e*x)**2)*F**(2*b*f*n*log(
c)*log(d + e*x))*b*f*n**2*x*log(F)*log(d + e*x) + 2*F**(a*f)*F**(b*f*log(c)
**2)*F**(b*f*n**2*log(d + e*x)**2)*F**(2*b*f*n*log(c)*log(d + e*x))*b*f*n**
2*x*log(F) - 2*F**(a*f)*F**(b*f*log(c)**2)*F**(b*f*n**2*log(d + e*x)**2)*F*
*(2*b*f*n*log(c)*log(d + e*x))*b*f*n*x*log(F)*log(c) + F**(a*f)*F**(b*f*log
(c)**2)*F**(b*f*n**2*log(d + e*x)**2)*F**(2*b*f*n*log(c)*log(d + e*x))*d/e
+ F**(a*f)*F**(b*f*log(c)**2)*F**(b*f*n**2*log(d + e*x)**2)*F**(2*b*f*n*log
(c)*log(d + e*x))*x, Ne(e, 0)), (F**(f*(a + b*log(c*d**n)**2))*x, True))
```

3.591 $\int \frac{F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}}{dg+egx}\,dx$

Optimal. Leaf size=67

$$\frac{\sqrt{\pi}F^{af}\text{erfi}\left(\sqrt{b}\sqrt{f}\sqrt{\log(F)}\log\left(c(d+ex)^n\right)\right)}{2\sqrt{b}e\sqrt{f}gn\sqrt{\log(F)}}$$

```
[Out] 1/2*F^(a*f)*erfi(ln(c*(e*x+d)^n)*b^(1/2)*f^(1/2)*ln(F)^(1/2))*Pi^(1/2)/e/g/
n/b^(1/2)/f^(1/2)/ln(F)^(1/2)
```

Rubi [A] time = 0.14, antiderivative size = 67, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {12, 2276, 2204}

$$\frac{\sqrt{\pi}F^{af}\text{Erfi}\left(\sqrt{b}\sqrt{f}\sqrt{\log(F)}\log\left(c(d+ex)^n\right)\right)}{2\sqrt{b}e\sqrt{f}gn\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n]^2))/(d*g + e*g*x),x]
```

```
[Out] (F^(a*f)*Sqrt[Pi]*Erfi[Sqrt[b]*Sqrt[f]*Sqrt[Log[F]]*Log[c*(d + e*x)^n]])/(2
*Sqrt[b]*e*Sqrt[f]*g*n*Sqrt[Log[F]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2276

```
Int[(F_)^(((a_.) + Log[(c_.)*(x_)^(n_.)]^2*(b_.))*(d_.))*((e_.)*(x_))^(m_.)
, x_Symbol] :> Dist[(e*x)^(m + 1)/(e*n*(c*x^n)^((m + 1)/n)), Subst[Int[E^(a
*d*Log[F] + ((m + 1)*x)/n + b*d*Log[F]*x^2), x], x, Log[c*x^n]], x] /; Free
Q[{F, a, b, c, d, e, m, n}, x]
```

Rubi steps

$$\int \frac{F^{f\left(a+b\log^2(c(d+ex)^n)\right)}}{dg+egx}\,dx = \frac{\text{Subst}\left(\int \frac{F^{f\left(a+b\log^2(cx^n)\right)}}{gx}\,dx, x, d+ex\right)}{e}$$
$$= \frac{\text{Subst}\left(\int \frac{F^{f\left(a+b\log^2(cx^n)\right)}}{x}\,dx, x, d+ex\right)}{eg}$$
$$= \frac{\text{Subst}\left(\int e^{af\log(F)+bfx^2\log(F)}\,dx, x, \log\left(c(d+ex)^n\right)\right)}{egn}$$
$$= \frac{F^{af}\sqrt{\pi}\,\text{erfi}\left(\sqrt{b}\sqrt{f}\sqrt{\log(F)}\,\log\left(c(d+ex)^n\right)\right)}{2\sqrt{b}\,e\sqrt{f}\,gn\sqrt{\log(F)}}$$

Mathematica [A] time = 0.05, size = 67, normalized size = 1.00

$$\frac{\sqrt{\pi}\,F^{af}\text{erfi}\left(\sqrt{b}\sqrt{f}\sqrt{\log(F)}\,\log\left(c(d+ex)^n\right)\right)}{2\sqrt{b}\,e\sqrt{f}\,gn\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n]^2))/(d*g + e*g*x),x]
```

```
[Out] (F^(a*f)*Sqrt[Pi]*Erfi[Sqrt[b]*Sqrt[f]*Sqrt[Log[F]]*Log[c*(d + e*x)^n]])/(2
*Sqrt[b]*e*Sqrt[f]*g*n*Sqrt[Log[F]])
```

fricas [A] time = 0.41, size = 57, normalized size = 0.85

$$-\frac{\sqrt{\pi}\sqrt{-bfn^2\log(F)}\,F^{af}\,\text{erf}\left(\frac{\sqrt{-bfn^2\log(F)}\left(n\log(ex+d)+\log(c)\right)}{n}\right)}{2\,egn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))/(e*g*x+d*g),x, algorithm="fricas")
```

```
[Out] -1/2*sqrt(pi)*sqrt(-b*f*n^2*log(F))*F^(a*f)*erf(sqrt(-b*f*n^2*log(F))*(n*lo
g(e*x + d) + log(c))/n)/(e*g*n)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{\left(b\log\left(\left(ex+d\right)^{n}c\right)^{2}+a\right)f}}{egx+dg}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))/(e*g*x+d*g),x, algorithm="giac")
[Out] integrate(F^((b*log((e*x + d)^n*c)^2 + a)*f)/(e*g*x + d*g), x)
```

maple [F(-1)] time = 180.00, size = 0, normalized size = 0.00

$$\int \frac{F^{\left(b\ln\left(c\left(ex+d\right)^{n}\right)^{2}+a\right)f}}{egx+dg}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^((b*ln(c*(e*x+d)^n)^2+a)*f)/(e*g*x+d*g),x)
[Out] int(F^((b*ln(c*(e*x+d)^n)^2+a)*f)/(e*g*x+d*g),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{\left(b\log\left(\left(ex+d\right)^{n}c\right)^{2}+a\right)f}}{egx+dg}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))/(e*g*x+d*g),x, algorithm="maxima")
[Out] integrate(F^((b*log((e*x + d)^n*c)^2 + a)*f)/(e*g*x + d*g), x)
```

mupad [B] time = 3.74, size = 49, normalized size = 0.73

$$\frac{F^{a\,f}\,\sqrt{\pi}\,\mathrm{erfi}\left(\frac{b\,f\,\ln(F)\,\ln\left(c\,{\left(d+e\,x\right)}^{n}\right)}{\sqrt{b\,f\,\ln(F)}}\right)}{2\,e\,g\,n\,\sqrt{b\,f\,\ln(F)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n)^2))/(d*g + e*g*x),x)
[Out] (F^(a*f)*pi^(1/2)*erfi((b*f*log(F)*log(c*(d + e*x)^n))/(b*f*log(F))^(1/2)))
/(2*e*g*n*(b*f*log(F))^(1/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{F^{af}F^{bf\log\left(c(d+ex)^n\right)^2}}{d+ex}\,dx}{g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n)**2))/(e*g*x+d*g),x)
```

```
[Out] Integral(F**(a*f)*F**(b*f*log(c*(d + e*x)**n)**2)/(d + e*x), x)/g
```

3.592 $\int \frac{F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}}{(dg+egx)^2}\,dx$

Optimal. Leaf size=121

$$-\frac{\sqrt{\pi}F^{af}e^{-\frac{1}{4bfn^2\log(F)}}\left(c(d+ex)^n\right)^{\frac{1}{n}}\operatorname{erfi}\left(\frac{1-2bfn\log(F)\log(c(d+ex)^n)}{2\sqrt{b}\sqrt{f}n\sqrt{\log(F)}}\right)}{2\sqrt{b}e\sqrt{f}g^2n\sqrt{\log(F)}(d+ex)}$$

```
[Out] 1/2*F^(a*f)*(c*(e*x+d)^n)^(1/n)*erfi(1/2*(-1+2*b*f*n*ln(F)*ln(c*(e*x+d)^n))
/n/b^(1/2)/f^(1/2)/ln(F)^(1/2))*Pi^(1/2)/e/exp(1/4/b/f/n^2/ln(F))/g^2/n/(e*
x+d)/b^(1/2)/f^(1/2)/ln(F)^(1/2)
```

Rubi [A] time = 0.23, antiderivative size = 121, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.129, Rules used = {12, 2276, 2234, 2204}

$$-\frac{\sqrt{\pi}F^{af}e^{-\frac{1}{4bfn^2\log(F)}}\left(c(d+ex)^n\right)^{\frac{1}{n}}\operatorname{Erfi}\left(\frac{1-2bfn\log(F)\log(c(d+ex)^n)}{2\sqrt{b}\sqrt{f}n\sqrt{\log(F)}}\right)}{2\sqrt{b}e\sqrt{f}g^2n\sqrt{\log(F)}(d+ex)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n]^2))/(d*g + e*g*x)^2,x]
```

```
[Out] -(F^(a*f)*Sqrt[Pi]*(c*(d + e*x)^n)^n^(-1)*Erfi[(1 - 2*b*f*n*Log[F]*Log[c*(d
 + e*x)^n])/(2*Sqrt[b]*Sqrt[f]*n*Sqrt[Log[F]])])/(2*Sqrt[b]*e*E^(1/(4*b*f*n
^2*Log[F]))*Sqrt[f]*g^2*n*(d + e*x)*Sqrt[Log[F]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2234

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2276

```
Int[(F_)^(((a_.) + Log[(c_.)*(x_)^(n_.)]^2*(b_.))*(d_.))*((e_.)*(x_))^(m_.)
, x_Symbol] :> Dist[(e*x)^(m + 1)/(e*n*(c*x^n)^((m + 1)/n)), Subst[Int[E^(a
*d*Log[F] + ((m + 1)*x)/n + b*d*Log[F]*x^2), x], x, Log[c*x^n]], x] /; Free
Q[{F, a, b, c, d, e, m, n}, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}}{(dg+egx)^2}\,dx &= \frac{\text{Subst}\left(\int \frac{F^{f\left(a+b\log^2\left(cx^n\right)\right)}}{g^2x^2}\,dx,x,d+ex\right)}{e}\\
&= \frac{\text{Subst}\left(\int \frac{F^{f\left(a+b\log^2\left(cx^n\right)\right)}}{x^2}\,dx,x,d+ex\right)}{eg^2}\\
&= \frac{(c(d+ex)^n)^{\frac{1}{n}}\,\text{Subst}\left(\int e^{-\frac{x}{n}+af\log(F)+bfx^2\log(F)}\,dx,x,\log\left(c(d+ex)^n\right)\right)}{eg^2n(d+ex)}\\
&= \frac{\left(e^{-\frac{1}{4bfn^2\log(F)}}F^{af}\left(c(d+ex)^n\right)^{\frac{1}{n}}\right)\text{Subst}\left(\int e^{\frac{\left(-\frac{1}{n}+2bfx\log(F)\right)^2}{4bf\log(F)}}\,dx,x,\log\left(c(d+ex)^n\right)\right)}{eg^2n(d+ex)}\\
&= -\frac{e^{-\frac{1}{4bfn^2\log(F)}}F^{af}\sqrt{\pi}\left(c(d+ex)^n\right)^{\frac{1}{n}}\,\text{erfi}\left(\frac{1-2bfn\log(F)\log(c(d+ex)^n)}{2\sqrt{b}\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e\sqrt{f}\,g^2n(d+ex)\sqrt{\log(F)}}
\end{aligned}$$

Mathematica [A] time = 0.21, size = 121, normalized size = 1.00

$$\frac{\sqrt{\pi}F^{af}e^{-\frac{1}{4bfn^2\log(F)}}\left(c(d+ex)^n\right)^{\frac{1}{n}}\,\text{erfi}\left(\frac{2bfn\log(F)\log(c(d+ex)^n)-1}{2\sqrt{b}\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e\sqrt{f}\,g^2n\sqrt{\log(F)}\,(d+ex)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n]^2))/(d*g + e*g*x)^2,x]
```

```
[Out] (F^(a*f)*Sqrt[Pi]*(c*(d + e*x)^n)^n^(-1)*Erfi[(-1 + 2*b*f*n*Log[F]*Log[c*(d
 + e*x)^n])/(2*Sqrt[b]*Sqrt[f]*n*Sqrt[Log[F]])])/(2*Sqrt[b]*e*E^(1/(4*b*f*n
^2*Log[F]))*Sqrt[f]*g^2*n*(d + e*x)*Sqrt[Log[F]])
```

fricas [A] time = 0.41, size = 119, normalized size = 0.98

$$-\frac{\sqrt{\pi}\sqrt{-bfn^2\log(F)}\,\mathrm{erf}\left(\frac{\left(2\,bfn^2\log(ex+d)\log(F)+2\,bfn\log(F)\log(c)-1\right)\sqrt{-bfn^2\log(F)}}{2\,bfn^2\log(F)}\right)e^{\left(\frac{4\,abf^2n^2\log(F)^2+4\,bfn\log(F)\log(c)-1}{4\,bfn^2\log(F)}\right)}}{2\,eg^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))/(e*g*x+d*g)^2,x, algorithm="fricas
")
```

```
[Out] -1/2*sqrt(pi)*sqrt(-b*f*n^2*log(F))*erf(1/2*(2*b*f*n^2*log(e*x + d)*log(F)
+ 2*b*f*n*log(F)*log(c) - 1)*sqrt(-b*f*n^2*log(F))/(b*f*n^2*log(F)))*e^(1/4
*(4*a*b*f^2*n^2*log(F)^2 + 4*b*f*n*log(F)*log(c) - 1)/(b*f*n^2*log(F)))/(e*
g^2*n)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{\left(b\log\left((ex+d)^n c\right)^2+a\right)f}}{\left(egx+dg\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))/(e*g*x+d*g)^2,x, algorithm="giac")
```

```
[Out] integrate(F^((b*log((e*x + d)^n*c)^2 + a)*f)/(e*g*x + d*g)^2, x)
```

maple [F] time = 0.61, size = 0, normalized size = 0.00

$$\int \frac{F^{\left(b\ln\left(c(ex+d)^n\right)^2+a\right)f}}{\left(egx+dg\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^((b*ln(c*(e*x+d)^n)^2+a)*f)/(e*g*x+d*g)^2,x)
```

```
[Out] int(F^((b*ln(c*(e*x+d)^n)^2+a)*f)/(e*g*x+d*g)^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{\left(b\log\left((ex+d)^n c\right)^2+a\right)f}}{\left(egx+dg\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))/(e*g*x+d*g)^2,x, algorithm="maxima
")
```

```
[Out] integrate(F^((b*log((e*x + d)^n*c)^2 + a)*f)/(e*g*x + d*g)^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{e}^{f\,\ln(F)\,\left(b\ln\left(c\,(d+e\,x)^n\right)^2+a\right)}}{\left(d\,g+e\,g\,x\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n)^2))/(d*g + e*g*x)^2,x)
```

```
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n)^2))/(d*g + e*g*x)^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n)**2))/(e*g*x+d*g)**2,x)
```

```
[Out] Timed out
```

3.593 $\int \frac{F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}}{(dg+egx)^3}\,dx$

Optimal. Leaf size=118

$$-\frac{\sqrt{\pi}\,F^{af}e^{-\frac{1}{bfn^2\log(F)}}\left(c(d+ex)^n\right)^{2/n}\operatorname{erfi}\left(\frac{1-bfn\log(F)\log(c(d+ex)^n)}{\sqrt{b}\,\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e\sqrt{f}\,g^3n\sqrt{\log(F)}\,(d+ex)^2}$$

```
[Out] 1/2*F^(a*f)*(c*(e*x+d)^n)^(2/n)*erfi((-1+b*f*n*ln(F)*ln(c*(e*x+d)^n))/n/b^(
1/2)/f^(1/2)/ln(F)^(1/2))*Pi^(1/2)/e/exp(1/b/f/n^2/ln(F))/g^3/n/(e*x+d)^2/b
^(1/2)/f^(1/2)/ln(F)^(1/2)
```

Rubi [A] time = 0.23, antiderivative size = 118, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.129, Rules used = {12, 2276, 2234, 2204}

$$-\frac{\sqrt{\pi}\,F^{af}e^{-\frac{1}{bfn^2\log(F)}}\left(c(d+ex)^n\right)^{2/n}\operatorname{Erfi}\left(\frac{1-bfn\log(F)\log(c(d+ex)^n)}{\sqrt{b}\,\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e\sqrt{f}\,g^3n\sqrt{\log(F)}\,(d+ex)^2}$$

Antiderivative was successfully verified.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n]^2))/(d*g + e*g*x)^3,x]
```

```
[Out] -(F^(a*f)*Sqrt[Pi]*(c*(d + e*x)^n)^(2/n)*Erfi[(1 - b*f*n*Log[F]*Log[c*(d +
e*x)^n])/(Sqrt[b]*Sqrt[f]*n*Sqrt[Log[F]])])/(2*Sqrt[b]*e*E^(1/(b*f*n^2*Log[
F]))*Sqrt[f]*g^3*n*(d + e*x)^2*Sqrt[Log[F]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2234

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2276

```
Int[(F_)^(((a_.) + Log[(c_.)*(x_)^(n_.)]^2*(b_.))*(d_.))*((e_.)*(x_))^(m_.)
, x_Symbol] :> Dist[(e*x)^(m + 1)/(e*n*(c*x^n)^((m + 1)/n)), Subst[Int[E^(a
*d*Log[F] + ((m + 1)*x)/n + b*d*Log[F]*x^2), x], x, Log[c*x^n]], x] /; Free
Q[{F, a, b, c, d, e, m, n}, x]
```

Rubi steps

$$\int \frac{F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}}{(dg+egx)^3}\,dx = \frac{\text{Subst}\left(\int \frac{F^{f\left(a+b\log^2\left(cx^n\right)\right)}}{g^3x^3}\,dx, x, d+ex\right)}{e}$$

$$= \frac{\text{Subst}\left(\int \frac{F^{f\left(a+b\log^2\left(cx^n\right)\right)}}{x^3}\,dx, x, d+ex\right)}{eg^3}$$

$$= \frac{\left(c(d+ex)^n\right)^{2/n}\text{Subst}\left(\int e^{-\frac{2x}{n}+af\log(F)+bfx^2\log(F)}\,dx, x, \log\left(c(d+ex)^n\right)\right)}{eg^3n(d+ex)^2}$$

$$= \frac{\left(e^{-\frac{1}{bfn^2\log(F)}}F^{af}\left(c(d+ex)^n\right)^{2/n}\right)\text{Subst}\left(\int e^{\frac{\left(-\frac{2}{n}+2bfx\log(F)\right)^2}{4bf\log(F)}}\,dx, x, \log\left(c(d+ex)^n\right)\right)}{eg^3n(d+ex)^2}$$

$$= -\frac{e^{-\frac{1}{bfn^2\log(F)}}F^{af}\sqrt{\pi}\left(c(d+ex)^n\right)^{2/n}\text{erfi}\left(\frac{1-bfn\log(F)\log\left(c(d+ex)^n\right)}{\sqrt{b}\sqrt{f}n\sqrt{\log(F)}}\right)}{2\sqrt{b}e\sqrt{f}g^3n(d+ex)^2\sqrt{\log(F)}}$$

Mathematica [A] time = 0.21, size = 117, normalized size = 0.99

$$\frac{\sqrt{\pi}F^{af}e^{-\frac{1}{bfn^2\log(F)}}\left(c(d+ex)^n\right)^{2/n}\text{erfi}\left(\frac{bfn\log(F)\log\left(c(d+ex)^n\right)-1}{\sqrt{b}\sqrt{f}n\sqrt{\log(F)}}\right)}{2\sqrt{b}e\sqrt{f}g^3n\sqrt{\log(F)}(d+ex)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n]^2))/(d*g + e*g*x)^3,x]
```

```
[Out] (F^(a*f)*Sqrt[Pi]*(c*(d + e*x)^n)^(2/n)*Erfi[(-1 + b*f*n*Log[F]*Log[c*(d +
e*x)^n])/(Sqrt[b]*Sqrt[f]*n*Sqrt[Log[F]])])/(2*Sqrt[b]*e*E^(1/(b*f*n^2*Log[
F]))*Sqrt[f]*g^3*n*(d + e*x)^2*Sqrt[Log[F]])
```

fricas [A] time = 0.41, size = 114, normalized size = 0.97

$$-\frac{\sqrt{\pi}\sqrt{-bfn^2\log(F)}\,\mathrm{erf}\left(\frac{\left(bfn^2\log(ex+d)\log(F)+bfn\log(F)\log(c)-1\right)\sqrt{-bfn^2\log(F)}}{bfn^2\log(F)}\right)e^{\left(\frac{abf^2n^2\log(F)^2+2\,bfn\log(F)\log(c)-1}{bfn^2\log(F)}\right)}}{2\,eg^3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))/(e*g*x+d*g)^3,x, algorithm="fricas
")
```

```
[Out] -1/2*sqrt(pi)*sqrt(-b*f*n^2*log(F))*erf((b*f*n^2*log(e*x + d)*log(F) + b*f*
n*log(F)*log(c) - 1)*sqrt(-b*f*n^2*log(F))/(b*f*n^2*log(F)))*e^((a*b*f^2*n^
2*log(F)^2 + 2*b*f*n*log(F)*log(c) - 1)/(b*f*n^2*log(F)))/(e*g^3*n)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{\left(b\log\left((ex+d)^nc\right)^2+a\right)f}}{\left(egx+dg\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))/(e*g*x+d*g)^3,x, algorithm="giac")
```

```
[Out] integrate(F^((b*log((e*x + d)^n*c)^2 + a)*f)/(e*g*x + d*g)^3, x)
```

maple [F] time = 0.76, size = 0, normalized size = 0.00

$$\int \frac{F^{\left(b\ln\left(c(ex+d)^n\right)^2+a\right)f}}{\left(egx+dg\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^((b*ln(c*(e*x+d)^n)^2+a)*f)/(e*g*x+d*g)^3,x)
```

```
[Out] int(F^((b*ln(c*(e*x+d)^n)^2+a)*f)/(e*g*x+d*g)^3,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{\left(b\log\left((ex+d)^nc\right)^2+a\right)f}}{\left(egx+dg\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))/(e*g*x+d*g)^3,x, algorithm="maxima
")
```

```
[Out] integrate(F^((b*log((e*x + d)^n*c)^2 + a)*f)/(e*g*x + d*g)^3, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{e}^{f\,\ln(F)\,\left(b\,\ln\left(c\,(d+e\,x)^n\right)^2+a\right)}}{\left(d\,g+e\,g\,x\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n)^2))/(d*g + e*g*x)^3,x)
```

```
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n)^2))/(d*g + e*g*x)^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n)**2))/(e*g*x+d*g)**3,x)
```

```
[Out] Timed out
```

3.594 $\int F^{f\left(a+b\log^2(c(d+ex)^n)\right)}(g+hx)^m\,dx$

Optimal. Leaf size=31

$$\operatorname{Int}\left((g+hx)^m F^{f\left(a+b\log^2(c(d+ex)^n)\right)},x\right)$$

```
[Out] Unintegrable(F^(f*(a+b*ln(c*(e*x+d)^n)^2))*(h*x+g)^m,x)
```

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int F^{f\left(a+b\log^2(c(d+ex)^n)\right)}(g+hx)^m\,dx$$

Verification is Not applicable to the result.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n]^2))*(g + h*x)^m,x]
[Out] Defer[Int][F^(f*(a + b*Log[c*(d + e*x)^n]^2))*(g + h*x)^m, x]
```

Rubi steps

$$\int F^{f\left(a+b\log^2(c(d+ex)^n)\right)}(g+hx)^m\,dx=\int F^{f\left(a+b\log^2(c(d+ex)^n)\right)}(g+hx)^m\,dx$$

Mathematica [A] time = 1.82, size = 0, normalized size = 0.00

$$\int F^{f\left(a+b\log^2(c(d+ex)^n)\right)}(g+hx)^m\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n]^2))*(g + h*x)^m,x]
[Out] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n]^2))*(g + h*x)^m, x]
```

fricas [A] time = 0.40, size = 0, normalized size = 0.00

$$\operatorname{integral}\left(\left(hx+g\right)^m F^{bf\log\left((ex+d)^n c\right)^2+af},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))*(h*x+g)^m,x, algorithm="fricas")
[Out] integral((h*x + g)^m*F^(b*f*log((e*x + d)^n*c)^2 + a*f), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(hx+g\right)^{m} F^{\left(b \log\left(\left(ex+d\right)^{n} c\right)^{2}+a\right) f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))*(h*x+g)^m,x, algorithm="giac")
[Out] integrate((h*x + g)^m*F^((b*log((e*x + d)^n*c)^2 + a)*f), x)
```

maple [A] time = 0.86, size = 0, normalized size = 0.00

$$\int F^{\left(b \ln\left(c\left(ex+d\right)^{n}\right)^{2}+a\right) f} \left(hx+g\right)^{m}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^((b*ln(c*(e*x+d)^n)^2+a)*f)*(h*x+g)^m,x)
[Out] int(F^((b*ln(c*(e*x+d)^n)^2+a)*f)*(h*x+g)^m,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(hx+g\right)^{m} F^{\left(b \log\left(\left(ex+d\right)^{n} c\right)^{2}+a\right) f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))*(h*x+g)^m,x, algorithm="maxima")
[Out] integrate((h*x + g)^m*F^((b*log((e*x + d)^n*c)^2 + a)*f), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \mathrm{e}^{f\,\ln(F)\,\left(b\,\ln\left(c\,(d+e\,x)^{n}\right)^{2}+a\right)}\,\left(g+h\,x\right)^{m}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n)^2))*(g + h*x)^m,x)
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n)^2))*(g + h*x)^m, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n)**2))*(h*x+g)**m,x)
[Out] Timed out
```

3.595 $\int F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}(g+hx)^3\,dx$

Optimal. Leaf size=502

$$\frac{3\sqrt{\pi}\,h^2F^{af}(d+ex)^3(eg-dh)e^{-\frac{9}{4bfn^2\log(F)}}\left(c(d+ex)^n\right)^{-3/n}\operatorname{erfi}\left(\frac{2bfn\log(F)\log\left(c(d+ex)^n\right)+3}{2\sqrt{b}\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e^4\sqrt{f}\,n\sqrt{\log(F)}}+\frac{3\sqrt{\pi}\,hF^{af}(d+ex)^2(eg-dh}{}$$

```
[Out] 3/2*F^(a*f)*h*(-d*h+e*g)^2*(e*x+d)^2*erfi((1+b*f*n*ln(F)*ln(c*(e*x+d)^n))/n
/b^(1/2)/f^(1/2)/ln(F)^(1/2))*Pi^(1/2)/e^4/exp(1/b/f/n^2/ln(F))/n/((c*(e*x+
d)^n)^(2/n))/b^(1/2)/f^(1/2)/ln(F)^(1/2)+1/2*F^(a*f)*h^3*(e*x+d)^4*erfi((2+
b*f*n*ln(F)*ln(c*(e*x+d)^n))/n/b^(1/2)/f^(1/2)/ln(F)^(1/2))*Pi^(1/2)/e^4/ex
p(4/b/f/n^2/ln(F))/n/((c*(e*x+d)^n)^(4/n))/b^(1/2)/f^(1/2)/ln(F)^(1/2)+1/2*
F^(a*f)*(-d*h+e*g)^3*(e*x+d)*erfi(1/2*(1+2*b*f*n*ln(F)*ln(c*(e*x+d)^n))/n/b
^(1/2)/f^(1/2)/ln(F)^(1/2))*Pi^(1/2)/e^4/exp(1/4/b/f/n^2/ln(F))/n/((c*(e*x+
d)^n)^(1/n))/b^(1/2)/f^(1/2)/ln(F)^(1/2)+3/2*F^(a*f)*h^2*(-d*h+e*g)*(e*x+d)
^3*erfi(1/2*(3+2*b*f*n*ln(F)*ln(c*(e*x+d)^n))/n/b^(1/2)/f^(1/2)/ln(F)^(1/2)
)*Pi^(1/2)/e^4/exp(9/4/b/f/n^2/ln(F))/n/((c*(e*x+d)^n)^(3/n))/b^(1/2)/f^(1/
2)/ln(F)^(1/2)
```

Rubi [F] time = 0.38, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}(g+hx)^3\,dx$$

Verification is Not applicable to the result.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n]^2))*(g + h*x)^3,x]
```

```
[Out] (F^(a*f)*g^3*Sqrt[Pi]*(d + e*x)*Erfi[(1 + 2*b*f*n*Log[F]*Log[c*(d + e*x)^n]
)/(2*Sqrt[b]*Sqrt[f]*n*Sqrt[Log[F]])])/(2*Sqrt[b]*e*E^(1/(4*b*f*n^2*Log[F])
)*Sqrt[f]*n*(c*(d + e*x)^n)^n^(-1)*Sqrt[Log[F]]) + 3*g^2*h*Defer[Int][F^(f*
(a + b*Log[c*(d + e*x)^n]^2))*x, x] + 3*g*h^2*Defer[Int][F^(f*(a + b*Log[c*
(d + e*x)^n]^2))*x^2, x] + h^3*Defer[Int][F^(f*(a + b*Log[c*(d + e*x)^n]^2)
)*x^3, x]
```

Rubi steps

$$\int F^{f\left(a+b\log^2(c(d+ex)^n)\right)}(g+hx)^3\,dx = \int \left(F^{f\left(a+b\log^2(c(d+ex)^n)\right)}g^3 + 3F^{f\left(a+b\log^2(c(d+ex)^n)\right)}g^2hx + 3F^{f\left(a+b\log^2(c(d+ex)^n)\right)}g\right.$$

$$= g^3\int F^{f\left(a+b\log^2(c(d+ex)^n)\right)}dx + \left(3g^2h\right)\int F^{f\left(a+b\log^2(c(d+ex)^n)\right)}x\,dx + \left(3gh^2\right)\int$$

$$= \frac{g^3\,\text{Subst}\left(\int F^{f\left(a+b\log^2(cx^n)\right)}dx, x, d+ex\right)}{e} + \left(3g^2h\right)\int F^{f\left(a+b\log^2(c(d+ex)^n)\right)}x\,d$$

$$= \left(3g^2h\right)\int F^{f\left(a+b\log^2(c(d+ex)^n)\right)}x\,dx + \left(3gh^2\right)\int F^{f\left(a+b\log^2(c(d+ex)^n)\right)}x^2\,dx + h^3$$

$$= \left(3g^2h\right)\int F^{f\left(a+b\log^2(c(d+ex)^n)\right)}x\,dx + \left(3gh^2\right)\int F^{f\left(a+b\log^2(c(d+ex)^n)\right)}x^2\,dx + h^3$$

$$= \frac{e^{-\frac{1}{4bfn^2\log(F)}}F^{af}g^3\sqrt{\pi}\,(d+ex)\,(c(d+ex)^n)^{-1/n}\,\text{erfi}\left(\frac{1+2bfn\log(F)\log(c(d+ex)^n)}{2\sqrt{b}\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e\sqrt{f}\,n\sqrt{\log(F)}} +$$

Mathematica [A] time = 1.59, size = 396, normalized size = 0.79

$$\sqrt{\pi}\,F^{af}(d+ex)e^{-\frac{4}{bfn^2\log(F)}}\,(c(d+ex)^n)^{-4/n}\left((eg-dh)e^{\frac{7}{4bfn^2\log(F)}}\,(c(d+ex)^n)^{\frac{1}{n}}\left((eg-dh)^2e^{\frac{2}{bfn^2\log(F)}}\,(c(d+ex)^n)^{2/n}\,e\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n]^2))*(g + h*x)^3,x]
```

```
[Out] (F^(a*f)*Sqrt[Pi]*(d + e*x)*(3*E^(3/(b*f*n^2*Log[F]))*h*(e*g - d*h)^2*(d +
e*x)*(c*(d + e*x)^n)^(2/n)*Erfi[(1 + b*f*n*Log[F]*Log[c*(d + e*x)^n])/(Sqrt
[b]*Sqrt[f]*n*Sqrt[Log[F]])] + h^3*(d + e*x)^3*Erfi[(2 + b*f*n*Log[F]*Log[c
*(d + e*x)^n])/(Sqrt[b]*Sqrt[f]*n*Sqrt[Log[F]])] + E^(7/(4*b*f*n^2*Log[F]))
*(e*g - d*h)*(c*(d + e*x)^n)^n^(-1)*(E^(2/(b*f*n^2*Log[F]))*(e*g - d*h)^2*(
c*(d + e*x)^n)^(2/n)*Erfi[(1 + 2*b*f*n*Log[F]*Log[c*(d + e*x)^n])/(2*Sqrt[b
]*Sqrt[f]*n*Sqrt[Log[F]])] + 3*h^2*(d + e*x)^2*Erfi[(3 + 2*b*f*n*Log[F]*Log
[c*(d + e*x)^n])/(2*Sqrt[b]*Sqrt[f]*n*Sqrt[Log[F]])])))/(2*Sqrt[b]*e^4*E^(4
/(b*f*n^2*Log[F]))*Sqrt[f]*n*(c*(d + e*x)^n)^(4/n)*Sqrt[Log[F]])
```

fricas [A] time = 0.42, size = 513, normalized size = 1.02

$$-\frac{\sqrt{\pi}\,\sqrt{-bfn^2\log(F)}\,h^3\,\text{erf}\left(\frac{\left(bfn^2\log(ex+d)\log(F)+bfn\log(F)\log(c)+2\right)\sqrt{-bfn^2\log(F)}}{bfn^2\log(F)}\right)e^{\left(\frac{abf^2n^2\log(F)^2-4bfn\log(F)\log(c)-4}{bfn^2\log(F)}\right)} + \sqrt{\pi}\,\left(\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))*(h*x+g)^3,x, algorithm="fricas")
```

```
[Out] -1/2*(sqrt(pi)*sqrt(-b*f*n^2*log(F))*h^3*erf((b*f*n^2*log(e*x + d)*log(F) +
 b*f*n*log(F)*log(c) + 2)*sqrt(-b*f*n^2*log(F))/(b*f*n^2*log(F)))*e^((a*b*f
^2*n^2*log(F)^2 - 4*b*f*n*log(F)*log(c) - 4)/(b*f*n^2*log(F))) + sqrt(pi)*(
e^3*g^3 - 3*d*e^2*g^2*h + 3*d^2*e*g*h^2 - d^3*h^3)*sqrt(-b*f*n^2*log(F))*er
f(1/2*(2*b*f*n^2*log(e*x + d)*log(F) + 2*b*f*n*log(F)*log(c) + 1)*sqrt(-b*f
*n^2*log(F))/(b*f*n^2*log(F)))*e^(1/4*(4*a*b*f^2*n^2*log(F)^2 - 4*b*f*n*log
(F)*log(c) - 1)/(b*f*n^2*log(F))) + 3*sqrt(pi)*sqrt(-b*f*n^2*log(F))*(e*g*h
^2 - d*h^3)*erf(1/2*(2*b*f*n^2*log(e*x + d)*log(F) + 2*b*f*n*log(F)*log(c)
+ 3)*sqrt(-b*f*n^2*log(F))/(b*f*n^2*log(F)))*e^(1/4*(4*a*b*f^2*n^2*log(F)^2
 - 12*b*f*n*log(F)*log(c) - 9)/(b*f*n^2*log(F))) + 3*sqrt(pi)*(e^2*g^2*h -
2*d*e*g*h^2 + d^2*h^3)*sqrt(-b*f*n^2*log(F))*erf((b*f*n^2*log(e*x + d)*log(
F) + b*f*n*log(F)*log(c) + 1)*sqrt(-b*f*n^2*log(F))/(b*f*n^2*log(F)))*e^((a
*b*f^2*n^2*log(F)^2 - 2*b*f*n*log(F)*log(c) - 1)/(b*f*n^2*log(F))))/(e^4*n)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(hx+g\right)^{3} F^{\left(b \log\left(\left(ex+d\right)^{n} c\right)^{2}+a\right)f}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))*(h*x+g)^3,x, algorithm="giac")
```

```
[Out] integrate((h*x + g)^3*F^((b*log((e*x + d)^n*c)^2 + a)*f), x)
```

maple [F] time = 0.70, size = 0, normalized size = 0.00

$$\int \left(hx+g\right)^{3} F^{\left(b \ln\left(c\left(ex+d\right)^{n}\right)^{2}+a\right)f}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^((b*ln(c*(e*x+d)^n)^2+a)*f)*(h*x+g)^3,x)
```

```
[Out] int(F^((b*ln(c*(e*x+d)^n)^2+a)*f)*(h*x+g)^3,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(hx+g\right)^{3} F^{\left(b \log\left(\left(ex+d\right)^{n} c\right)^{2}+a\right)f}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))*(h*x+g)^3,x, algorithm="maxima")
```

[Out] integrate((h*x + g)^3*F^((b*log((e*x + d)^n*c)^2 + a)*f), x)

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int e^{f\,\ln(F)\,\left(b\,\ln\left(c\,(d+e\,x)^n\right)^2+a\right)}\,\left(g+h\,x\right)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(F^(f*(a + b*log(c*(d + e*x)^n)^2))*(g + h*x)^3,x)

[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n)^2))*(g + h*x)^3, x)

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n)**2))*(h*x+g)**3,x)

[Out] Timed out

3.596 $\int F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}(g+hx)^2\,dx$

Optimal. Leaf size=372

$$\frac{\sqrt{\pi}\,hF^{af}(d+ex)^2(eg-dh)e^{-\frac{1}{bfn^2\log(F)}}\left(c(d+ex)^n\right)^{-2/n}\operatorname{erfi}\left(\frac{bfn\log(F)\log\left(c(d+ex)^n\right)+1}{\sqrt{b}\,\sqrt{f}\,n\sqrt{\log(F)}}\right)}{\sqrt{b}\,e^3\sqrt{f}\,n\sqrt{\log(F)}}+\frac{\sqrt{\pi}\,F^{af}(d+ex)(eg-dh)^2e^{-\frac{1}{4bf\cdots}}}{\cdots}$$

```
[Out] F^(a*f)*h*(-d*h+e*g)*(e*x+d)^2*erfi((1+b*f*n*ln(F)*ln(c*(e*x+d)^n))/n/b^(1/
2)/f^(1/2)/ln(F)^(1/2))*Pi^(1/2)/e^3/exp(1/b/f/n^2/ln(F))/n/((c*(e*x+d)^n)^
(2/n))/b^(1/2)/f^(1/2)/ln(F)^(1/2)+1/2*F^(a*f)*(-d*h+e*g)^2*(e*x+d)*erfi(1/
2*(1+2*b*f*n*ln(F)*ln(c*(e*x+d)^n))/n/b^(1/2)/f^(1/2)/ln(F)^(1/2))*Pi^(1/2)
/e^3/exp(1/4/b/f/n^2/ln(F))/n/((c*(e*x+d)^n)^(1/n))/b^(1/2)/f^(1/2)/ln(F)^(
1/2)+1/2*F^(a*f)*h^2*(e*x+d)^3*erfi(1/2*(3+2*b*f*n*ln(F)*ln(c*(e*x+d)^n))/n
/b^(1/2)/f^(1/2)/ln(F)^(1/2))*Pi^(1/2)/e^3/exp(9/4/b/f/n^2/ln(F))/n/((c*(e*
x+d)^n)^(3/n))/b^(1/2)/f^(1/2)/ln(F)^(1/2)
```

Rubi [F] time = 0.31, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}(g+hx)^2\,dx$$

Verification is Not applicable to the result.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n]^2))*(g + h*x)^2,x]
```

```
[Out] (F^(a*f)*g^2*Sqrt[Pi]*(d + e*x)*Erfi[(1 + 2*b*f*n*Log[F]*Log[c*(d + e*x)^n]
)/(2*Sqrt[b]*Sqrt[f]*n*Sqrt[Log[F]])])/(2*Sqrt[b]*e*E^(1/(4*b*f*n^2*Log[F])
)*Sqrt[f]*n*(c*(d + e*x)^n)^n^(-1)*Sqrt[Log[F]]) + 2*g*h*Defer[Int][F^(f*(a
 + b*Log[c*(d + e*x)^n]^2))*x, x] + h^2*Defer[Int][F^(f*(a + b*Log[c*(d + e
*x)^n]^2))*x^2, x]
```

Rubi steps

$$\int F^{f\left(a+b\log^2(c(d+ex)^n)\right)}(g+hx)^2\,dx = \int \left(F^{f\left(a+b\log^2(c(d+ex)^n)\right)}g^2 + 2F^{f\left(a+b\log^2(c(d+ex)^n)\right)}ghx + F^{f\left(a+b\log^2(c(d+ex)^n)\right)}h^2x\right.$$

$$= g^2\int F^{f\left(a+b\log^2(c(d+ex)^n)\right)}\,dx + (2gh)\int F^{f\left(a+b\log^2(c(d+ex)^n)\right)}x\,dx + h^2\int F^{f\left(a+b\right.}$$

$$= \frac{g^2\,\mathrm{Subst}\left(\int F^{f\left(a+b\log^2(cx^n)\right)}\,dx, x, d+ex\right)}{e} + (2gh)\int F^{f\left(a+b\log^2(c(d+ex)^n)\right)}x\,dx$$

$$= (2gh)\int F^{f\left(a+b\log^2(c(d+ex)^n)\right)}x\,dx + h^2\int F^{f\left(a+b\log^2(c(d+ex)^n)\right)}x^2\,dx + \frac{\left(g^2(d+e\right.}{}$$

$$= (2gh)\int F^{f\left(a+b\log^2(c(d+ex)^n)\right)}x\,dx + h^2\int F^{f\left(a+b\log^2(c(d+ex)^n)\right)}x^2\,dx + \frac{\left(e^{-\frac{1}{4bfn^2\log}}\right.}{}$$

$$= \frac{e^{-\frac{1}{4bfn^2\log(F)}}F^{af}g^2\sqrt{\pi}\,(d+ex)\,(c(d+ex)^n)^{-1/n}\,\mathrm{erfi}\left(\frac{1+2bfn\log(F)\log(c(d+ex)^n)}{2\sqrt{b}\,\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e\sqrt{f}\,n\sqrt{\log(F)}} +$$

Mathematica [A] time = 0.81, size = 303, normalized size = 0.81

$$\frac{\sqrt{\pi}\,F^{af}(d+ex)e^{-\frac{9}{4bfn^2\log(F)}}\,(c(d+ex)^n)^{-3/n}\left((eg-dh)^2e^{\frac{2}{bfn^2\log(F)}}\,(c(d+ex)^n)^{2/n}\,\mathrm{erfi}\left(\frac{2bfn\log(F)\log(c(d+ex)^n)+1}{2\sqrt{b}\,\sqrt{f}\,n\sqrt{\log(F)}}\right) - 2h\right.}{2\sqrt{b}\,e^3\sqrt{f}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n]^2))*(g + h*x)^2,x]
```

```
[Out] (F^(a*f)*Sqrt[Pi]*(d + e*x)*(-2*E^(5/(4*b*f*n^2*Log[F]))*h*(-(e*g) + d*h)*(
d + e*x)*(c*(d + e*x)^n)^n^(-1)*Erfi[(1 + b*f*n*Log[F]*Log[c*(d + e*x)^n])/
(Sqrt[b]*Sqrt[f]*n*Sqrt[Log[F]])] + E^(2/(b*f*n^2*Log[F]))*(e*g - d*h)^2*(c
*(d + e*x)^n)^(2/n)*Erfi[(1 + 2*b*f*n*Log[F]*Log[c*(d + e*x)^n])/(2*Sqrt[b]
*Sqrt[f]*n*Sqrt[Log[F]])] + h^2*(d + e*x)^2*Erfi[(3 + 2*b*f*n*Log[F]*Log[c*
(d + e*x)^n])/(2*Sqrt[b]*Sqrt[f]*n*Sqrt[Log[F]])]))/(2*Sqrt[b]*e^3*E^(9/(4*
b*f*n^2*Log[F]))*Sqrt[f]*n*(c*(d + e*x)^n)^(3/n)*Sqrt[Log[F]])
```

fricas [A] time = 0.42, size = 367, normalized size = 0.99

$$-\frac{\sqrt{\pi}\,\sqrt{-bfn^2\log(F)}\,h^2\,\mathrm{erf}\left(\frac{\left(2\,bfn^2\log(ex+d)\log(F)+2\,bfn\log(F)\log(c)+3\right)\sqrt{-bfn^2\log(F)}}{2\,bfn^2\log(F)}\right)e^{\left(\frac{4\,abf^2n^2\log(F)^2-12\,bfn\log(F)\log(c)-9}{4\,bfn^2\log(F)}\right)} + \cdots}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))*(h*x+g)^2,x, algorithm="fricas")
```

```
[Out] -1/2*(sqrt(pi)*sqrt(-b*f*n^2*log(F))*h^2*erf(1/2*(2*b*f*n^2*log(e*x + d)*lo
g(F) + 2*b*f*n*log(F)*log(c) + 3)*sqrt(-b*f*n^2*log(F))/(b*f*n^2*log(F)))*e
^(1/4*(4*a*b*f^2*n^2*log(F)^2 - 12*b*f*n*log(F)*log(c) - 9)/(b*f*n^2*log(F)
)) + sqrt(pi)*sqrt(-b*f*n^2*log(F))*(e^2*g^2 - 2*d*e*g*h + d^2*h^2)*erf(1/2
*(2*b*f*n^2*log(e*x + d)*log(F) + 2*b*f*n*log(F)*log(c) + 1)*sqrt(-b*f*n^2*
log(F))/(b*f*n^2*log(F)))*e^(1/4*(4*a*b*f^2*n^2*log(F)^2 - 4*b*f*n*log(F)*l
og(c) - 1)/(b*f*n^2*log(F))) + 2*sqrt(pi)*sqrt(-b*f*n^2*log(F))*(e*g*h - d*
h^2)*erf((b*f*n^2*log(e*x + d)*log(F) + b*f*n*log(F)*log(c) + 1)*sqrt(-b*f*
n^2*log(F))/(b*f*n^2*log(F)))*e^((a*b*f^2*n^2*log(F)^2 - 2*b*f*n*log(F)*log
(c) - 1)/(b*f*n^2*log(F))))/(e^3*n)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(hx+g\right)^{2} F^{\left(b \log\left(\left(ex+d\right)^{n} c\right)^{2}+a\right) f} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))*(h*x+g)^2,x, algorithm="giac")
```

```
[Out] integrate((h*x + g)^2*F^((b*log((e*x + d)^n*c)^2 + a)*f), x)
```

maple [F] time = 0.64, size = 0, normalized size = 0.00

$$\int \left(hx+g\right)^{2} F^{\left(b \ln\left(c\left(ex+d\right)^{n}\right)^{2}+a\right) f} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^((b*ln(c*(e*x+d)^n)^2+a)*f)*(h*x+g)^2,x)
```

```
[Out] int(F^((b*ln(c*(e*x+d)^n)^2+a)*f)*(h*x+g)^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(hx+g\right)^{2} F^{\left(b \log\left(\left(ex+d\right)^{n} c\right)^{2}+a\right) f} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))*(h*x+g)^2,x, algorithm="maxima")
```

```
[Out] integrate((h*x + g)^2*F^((b*log((e*x + d)^n*c)^2 + a)*f), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \mathrm{e}^{f\,\ln(F)\,\left(b\ln\left(c\,(d+e\,x)^n\right)^2+a\right)}\,\left(g+h\,x\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n)^2))*(g + h*x)^2,x)
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n)^2))*(g + h*x)^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n)**2))*(h*x+g)**2,x)
[Out] Timed out
```

3.597 $\int F^{f\left(a+b\log^2(c(d+ex)^n)\right)}(g+hx)\,dx$

Optimal. Leaf size=242

$$\frac{\sqrt{\pi}\,F^{af}(d+ex)(eg-dh)e^{-\frac{1}{4bfn^2\log(F)}}\,(c(d+ex)^n)^{-1/n}\,\text{erfi}\left(\frac{2bfn\log(F)\log(c(d+ex)^n)+1}{2\sqrt{b}\,\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e^2\sqrt{f}\,n\sqrt{\log(F)}}+\frac{\sqrt{\pi}\,hF^{af}(d+ex)^2e^{-\frac{1}{bfn^2\log(F)}}\,(c(\cdots}{2\sqrt{b}\,e\cdots}$$

```
[Out] 1/2*F^(a*f)*h*(e*x+d)^2*erfi((1+b*f*n*ln(F)*ln(c*(e*x+d)^n))/n/b^(1/2)/f^(1
/2)/ln(F)^(1/2))*Pi^(1/2)/e^2/exp(1/b/f/n^2/ln(F))/n/((c*(e*x+d)^n)^(2/n))/
b^(1/2)/f^(1/2)/ln(F)^(1/2)+1/2*F^(a*f)*(-d*h+e*g)*(e*x+d)*erfi(1/2*(1+2*b*
f*n*ln(F)*ln(c*(e*x+d)^n))/n/b^(1/2)/f^(1/2)/ln(F)^(1/2))*Pi^(1/2)/e^2/exp(
1/4/b/f/n^2/ln(F))/n/((c*(e*x+d)^n)^(1/n))/b^(1/2)/f^(1/2)/ln(F)^(1/2)
```

Rubi [F] time = 0.23, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int F^{f\left(a+b\log^2(c(d+ex)^n)\right)}(g+hx)\,dx$$

Verification is Not applicable to the result.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n]^2))*(g + h*x),x]
```

```
[Out] (F^(a*f)*g*Sqrt[Pi]*(d + e*x)*Erfi[(1 + 2*b*f*n*Log[F]*Log[c*(d + e*x)^n])/
(2*Sqrt[b]*Sqrt[f]*n*Sqrt[Log[F]])])/(2*Sqrt[b]*e*E^(1/(4*b*f*n^2*Log[F]))*
Sqrt[f]*n*(c*(d + e*x)^n)^n^(-1)*Sqrt[Log[F]]) + h*Defer[Int][F^(f*(a + b*L
og[c*(d + e*x)^n]^2))*x, x]
```

Rubi steps

$$\int F^{f\left(a+b\log^2(c(d+ex)^n)\right)}(g+hx)\,dx = \int \left(F^{f\left(a+b\log^2(c(d+ex)^n)\right)}g + F^{f\left(a+b\log^2(c(d+ex)^n)\right)}hx\right)\,dx$$

$$= g\int F^{f\left(a+b\log^2(c(d+ex)^n)\right)}\,dx + h\int F^{f\left(a+b\log^2(c(d+ex)^n)\right)}x\,dx$$

$$= \frac{g\,\text{Subst}\left(\int F^{f\left(a+b\log^2(cx^n)\right)}\,dx, x, d+ex\right)}{e} + h\int F^{f\left(a+b\log^2(c(d+ex)^n)\right)}x\,dx$$

$$= h\int F^{f\left(a+b\log^2(c(d+ex)^n)\right)}x\,dx + \frac{\left(g(d+ex)\left(c(d+ex)^n\right)^{-1/n}\right)\text{Subst}\left(\int e^{\frac{x}{n}+af\log(\cdots}\right.}{en}$$

$$= h\int F^{f\left(a+b\log^2(c(d+ex)^n)\right)}x\,dx + \frac{\left(e^{-\frac{1}{4bfn^2\log(F)}}F^{af}g(d+ex)\left(c(d+ex)^n\right)^{-1/n}\right)\text{Sub}\cdots}{en}$$

$$= \frac{e^{-\frac{1}{4bfn^2\log(F)}}F^{af}g\sqrt{\pi}\,(d+ex)\left(c(d+ex)^n\right)^{-1/n}\text{erfi}\left(\frac{1+2bfn\log(F)\log(c(d+ex)^n)}{2\sqrt{b}\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e\sqrt{f}\,n\sqrt{\log(F)}} + \cdots$$

Mathematica [A] time = 0.39, size = 204, normalized size = 0.84

$$\frac{\sqrt{\pi}\,F^{af}(d+ex)e^{-\frac{1}{bfn^2\log(F)}}\left(c(d+ex)^n\right)^{-2/n}\left((eg-dh)e^{\frac{3}{4bfn^2\log(F)}}\left(c(d+ex)^n\right)^{\frac{1}{n}}\text{erfi}\left(\frac{2bfn\log(F)\log(c(d+ex)^n)+1}{2\sqrt{b}\sqrt{f}\,n\sqrt{\log(F)}}\right)+h(d\cdots\right.}{2\sqrt{b}\,e^2\sqrt{f}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n]^2))*(g + h*x),x]
```

```
[Out] (F^(a*f)*Sqrt[Pi]*(d + e*x)*(h*(d + e*x)*Erfi[(1 + b*f*n*Log[F]*Log[c*(d +
e*x)^n])/(Sqrt[b]*Sqrt[f]*n*Sqrt[Log[F]])] + E^(3/(4*b*f*n^2*Log[F]))*(e*g
- d*h)*(c*(d + e*x)^n)^n^(-1)*Erfi[(1 + 2*b*f*n*Log[F]*Log[c*(d + e*x)^n])/
(2*Sqrt[b]*Sqrt[f]*n*Sqrt[Log[F]])]))/(2*Sqrt[b]*e^2*E^(1/(b*f*n^2*Log[F]))
*Sqrt[f]*n*(c*(d + e*x)^n)^(2/n)*Sqrt[Log[F]])
```

fricas [A] time = 0.41, size = 231, normalized size = 0.95

$$-\frac{\sqrt{\pi}\sqrt{-bfn^2\log(F)}\left(eg-dh\right)\text{erf}\left(\frac{\left(2bfn^2\log(ex+d)\log(F)+2bfn\log(F)\log(c)+1\right)\sqrt{-bfn^2\log(F)}}{2bfn^2\log(F)}\right)e^{\left(\frac{4abf^2n^2\log(F)^2-4bfn\log(F)\log(c)\cdots}{4bfn^2\log(F)}\right.}}{2e^2\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))*(h*x+g),x, algorithm="fricas")
```

```
[Out] -1/2*(sqrt(pi)*sqrt(-b*f*n^2*log(F))*(e*g - d*h)*erf(1/2*(2*b*f*n^2*log(e*x
 + d)*log(F) + 2*b*f*n*log(F)*log(c) + 1)*sqrt(-b*f*n^2*log(F))/(b*f*n^2*lo
g(F)))*e^(1/4*(4*a*b*f^2*n^2*log(F)^2 - 4*b*f*n*log(F)*log(c) - 1)/(b*f*n^2
*log(F))) + sqrt(pi)*sqrt(-b*f*n^2*log(F))*h*erf((b*f*n^2*log(e*x + d)*log(
F) + b*f*n*log(F)*log(c) + 1)*sqrt(-b*f*n^2*log(F))/(b*f*n^2*log(F)))*e^((a
*b*f^2*n^2*log(F)^2 - 2*b*f*n*log(F)*log(c) - 1)/(b*f*n^2*log(F))))/(e^2*n)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (hx+g)F^{\left(b\log\left((ex+d)^n c\right)^2+a\right)f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))*(h*x+g),x, algorithm="giac")
```

```
[Out] integrate((h*x + g)*F^((b*log((e*x + d)^n*c)^2 + a)*f), x)
```

maple [F] time = 0.67, size = 0, normalized size = 0.00

$$\int (hx+g)\,F^{\left(b\ln\left(c(ex+d)^n\right)^2+a\right)f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^((b*ln(c*(e*x+d)^n)^2+a)*f)*(h*x+g),x)
```

```
[Out] int(F^((b*ln(c*(e*x+d)^n)^2+a)*f)*(h*x+g),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (hx+g)F^{\left(b\log\left((ex+d)^n c\right)^2+a\right)f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))*(h*x+g),x, algorithm="maxima")
```

```
[Out] integrate((h*x + g)*F^((b*log((e*x + d)^n*c)^2 + a)*f), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \mathrm{e}^{f\,\ln(F)\,\left(b\ln\left(c\,(d+e\,x)^n\right)^2+a\right)}\,\left(g+h\,x\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n)^2))*(g + h*x),x)
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n)^2))*(g + h*x), x)
```

sympy [A] time = 113.97, size = 1329, normalized size = 5.49

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n)**2))*(h*x+g),x)
[Out] Piecewise((3*F**(a*f)*F**(b*f*log(c)**2)*F**(b*f*n**2*log(d + e*x)**2)*F**(
2*b*f*n*log(c)*log(d + e*x))*b*d**2*f*h*n**2*log(F)*log(d + e*x)/(2*e**2) +
 3*F**(a*f)*F**(b*f*log(c)**2)*F**(b*f*n**2*log(d + e*x)**2)*F**(2*b*f*n*lo
g(c)*log(d + e*x))*b*d**2*f*h*n**2*log(F)/(2*e**2) + 3*F**(a*f)*F**(b*f*log
(c)**2)*F**(b*f*n**2*log(d + e*x)**2)*F**(2*b*f*n*log(c)*log(d + e*x))*b*d*
*2*f*h*n*log(F)*log(c)/(2*e**2) - 2*F**(a*f)*F**(b*f*log(c)**2)*F**(b*f*n**
2*log(d + e*x)**2)*F**(2*b*f*n*log(c)*log(d + e*x))*b*d*f*g*n**2*log(F)*log
(d + e*x)/e - 2*F**(a*f)*F**(b*f*log(c)**2)*F**(b*f*n**2*log(d + e*x)**2)*F
**(2*b*f*n*log(c)*log(d + e*x))*b*d*f*g*n**2*log(F)/e - 2*F**(a*f)*F**(b*f*
log(c)**2)*F**(b*f*n**2*log(d + e*x)**2)*F**(2*b*f*n*log(c)*log(d + e*x))*b
*d*f*g*n*log(F)*log(c)/e + F**(a*f)*F**(b*f*log(c)**2)*F**(b*f*n**2*log(d +
 e*x)**2)*F**(2*b*f*n*log(c)*log(d + e*x))*b*d*f*h*n**2*x*log(F)*log(d + e*
x)/e - 3*F**(a*f)*F**(b*f*log(c)**2)*F**(b*f*n**2*log(d + e*x)**2)*F**(2*b*
f*n*log(c)*log(d + e*x))*b*d*f*h*n**2*x*log(F)/(2*e) + F**(a*f)*F**(b*f*log
(c)**2)*F**(b*f*n**2*log(d + e*x)**2)*F**(2*b*f*n*log(c)*log(d + e*x))*b*d*
f*h*n*x*log(F)*log(c)/e - 2*F**(a*f)*F**(b*f*log(c)**2)*F**(b*f*n**2*log(d
+ e*x)**2)*F**(2*b*f*n*log(c)*log(d + e*x))*b*f*g*n**2*x*log(F)*log(d + e*x
) + 2*F**(a*f)*F**(b*f*log(c)**2)*F**(b*f*n**2*log(d + e*x)**2)*F**(2*b*f*n
*log(c)*log(d + e*x))*b*f*g*n**2*x*log(F) - 2*F**(a*f)*F**(b*f*log(c)**2)*F
**(b*f*n**2*log(d + e*x)**2)*F**(2*b*f*n*log(c)*log(d + e*x))*b*f*g*n*x*log
(F)*log(c) - F**(a*f)*F**(b*f*log(c)**2)*F**(b*f*n**2*log(d + e*x)**2)*F**(
2*b*f*n*log(c)*log(d + e*x))*b*f*h*n**2*x**2*log(F)*log(d + e*x)/2 + F**(a*
f)*F**(b*f*log(c)**2)*F**(b*f*n**2*log(d + e*x)**2)*F**(2*b*f*n*log(c)*log(
d + e*x))*b*f*h*n**2*x**2*log(F)/4 - F**(a*f)*F**(b*f*log(c)**2)*F**(b*f*n*
*2*log(d + e*x)**2)*F**(2*b*f*n*log(c)*log(d + e*x))*b*f*h*n*x**2*log(F)*lo
g(c)/2 - F**(a*f)*F**(b*f*log(c)**2)*F**(b*f*n**2*log(d + e*x)**2)*F**(2*b*
f*n*log(c)*log(d + e*x))*d**2*h/(2*e**2) + F**(a*f)*F**(b*f*log(c)**2)*F**(
b*f*n**2*log(d + e*x)**2)*F**(2*b*f*n*log(c)*log(d + e*x))*d*g/e + F**(a*f)
*F**(b*f*log(c)**2)*F**(b*f*n**2*log(d + e*x)**2)*F**(2*b*f*n*log(c)*log(d
+ e*x))*g*x + F**(a*f)*F**(b*f*log(c)**2)*F**(b*f*n**2*log(d + e*x)**2)*F**
(2*b*f*n*log(c)*log(d + e*x))*h*x**2/2, Ne(e, 0)), (F**(f*(a + b*log(c*d**n
)**2))*(g*x + h*x**2/2), True))
```

3.598 $\int F^{f\left(a+b\log^2(c(d+ex)^n)\right)}\,dx$

Optimal. Leaf size=118

$$\frac{\sqrt{\pi}\,F^{af}(d+ex)e^{-\frac{1}{4bfn^2\log(F)}}\,(c(d+ex)^n)^{-1/n}\,\mathrm{erfi}\left(\frac{2bfn\log(F)\log(c(d+ex)^n)+1}{2\sqrt{b}\,\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e\sqrt{f}\,n\sqrt{\log(F)}}$$

```
[Out] 1/2*F^(a*f)*(e*x+d)*erfi(1/2*(1+2*b*f*n*ln(F)*ln(c*(e*x+d)^n))/n/b^(1/2)/f^
(1/2)/ln(F)^(1/2))*Pi^(1/2)/e/exp(1/4/b/f/n^2/ln(F))/n/((c*(e*x+d)^n)^(1/n)
)/b^(1/2)/f^(1/2)/ln(F)^(1/2)
```

Rubi [A] time = 0.09, antiderivative size = 118, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.150, Rules used = {2275, 2234, 2204}

$$\frac{\sqrt{\pi}\,F^{af}(d+ex)e^{-\frac{1}{4bfn^2\log(F)}}\,(c(d+ex)^n)^{-1/n}\,\mathrm{Erfi}\left(\frac{2bfn\log(F)\log(c(d+ex)^n)+1}{2\sqrt{b}\,\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e\sqrt{f}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n]^2)),x]
```

```
[Out] (F^(a*f)*Sqrt[Pi]*(d + e*x)*Erfi[(1 + 2*b*f*n*Log[F]*Log[c*(d + e*x)^n])/(2
*Sqrt[b]*Sqrt[f]*n*Sqrt[Log[F]])])/(2*Sqrt[b]*e*E^(1/(4*b*f*n^2*Log[F]))*Sq
rt[f]*n*(c*(d + e*x)^n)^n^(-1)*Sqrt[Log[F]])
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2234

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2275

```
Int[(F_)^(((a_.) + Log[(c_.)*(x_)^(n_.)]^2*(b_.))*(d_.)), x_Symbol] :> Dist
[x/(n*(c*x^n)^(1/n)), Subst[Int[E^(a*d*Log[F] + x/n + b*d*Log[F]*x^2), x],
x, Log[c*x^n]], x] /; FreeQ[{F, a, b, c, d, n}, x]
```

Rubi steps

$$\int F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}\,dx = \frac{\text{Subst}\left(\int F^{f\left(a+b\log^2(cx^n)\right)}\,dx, x, d+ex\right)}{e}$$

$$= \frac{\left((d+ex)\left(c(d+ex)^n\right)^{-1/n}\right)\text{Subst}\left(\int e^{\frac{x}{n}+af\log(F)+bfx^2\log(F)}\,dx, x, \log\left(c(d+ex)^n\right)\right)}{en}$$

$$= \frac{\left(e^{-\frac{1}{4bfn^2\log(F)}}F^{af}(d+ex)\left(c(d+ex)^n\right)^{-1/n}\right)\text{Subst}\left(\int e^{\frac{\left(\frac{1}{n}+2bfx\log(F)\right)^2}{4bf\log(F)}}\,dx, x, \log\left(c(d+ex)^n\right)\right)}{en}$$

$$= \frac{e^{-\frac{1}{4bfn^2\log(F)}}F^{af}\sqrt{\pi}\,(d+ex)\left(c(d+ex)^n\right)^{-1/n}\,\text{erfi}\left(\frac{1+2bfn\log(F)\log\left(c(d+ex)^n\right)}{2\sqrt{b}\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e\sqrt{f}\,n\sqrt{\log(F)}}$$

Mathematica [A] time = 0.02, size = 118, normalized size = 1.00

$$\frac{\sqrt{\pi}\,F^{af}(d+ex)e^{-\frac{1}{4bfn^2\log(F)}}\left(c(d+ex)^n\right)^{-1/n}\,\text{erfi}\left(\frac{2bfn\log(F)\log\left(c(d+ex)^n\right)+1}{2\sqrt{b}\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2\sqrt{b}\,e\sqrt{f}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n]^2)),x]
```

```
[Out] (F^(a*f)*Sqrt[Pi]*(d + e*x)*Erfi[(1 + 2*b*f*n*Log[F]*Log[c*(d + e*x)^n])/(2
*Sqrt[b]*Sqrt[f]*n*Sqrt[Log[F]])])/(2*Sqrt[b]*e*E^(1/(4*b*f*n^2*Log[F]))*Sq
rt[f]*n*(c*(d + e*x)^n)^n^(-1)*Sqrt[Log[F]])
```

fricas [A] time = 0.42, size = 116, normalized size = 0.98

$$-\frac{\sqrt{\pi}\,\sqrt{-bfn^2\log(F)}\,\text{erf}\left(\frac{\left(2\,bfn^2\log(ex+d)\log(F)+2\,bfn\log(F)\log(c)+1\right)\sqrt{-bfn^2\log(F)}}{2\,bfn^2\log(F)}\right)e^{\left(\frac{4\,abf^2n^2\log(F)^2-4\,bfn\log(F)\log(c)-1}{4\,bfn^2\log(F)}\right)}}{2\,en}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2)),x, algorithm="fricas")
```

```
[Out] -1/2*sqrt(pi)*sqrt(-b*f*n^2*log(F))*erf(1/2*(2*b*f*n^2*log(e*x + d)*log(F)
+ 2*b*f*n*log(F)*log(c) + 1)*sqrt(-b*f*n^2*log(F))/(b*f*n^2*log(F)))*e^(1/4
```

```
*(4*a*b*f^2*n^2*log(F)^2 - 4*b*f*n*log(F)*log(c) - 1)/(b*f*n^2*log(F)))/(e*
n)
```

giac [A] time = 0.40, size = 101, normalized size = 0.86

$$-\frac{\sqrt{\pi}F^{af}\operatorname{erf}\left(-\sqrt{-bf\log(F)}\,n\log\left(xe+d\right)-\sqrt{-bf\log(F)}\,\log(c)-\frac{\sqrt{-bf\log(F)}}{2\,bfn\log(F)}\right)e^{\left(-\frac{1}{4\,bfn^2\log(F)}-1\right)}}{2\sqrt{-bf\log(F)}\,c^{\left(\frac{1}{n}\right)}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2)),x, algorithm="giac")
```

```
[Out] -1/2*sqrt(pi)*F^(a*f)*erf(-sqrt(-b*f*log(F))*n*log(x*e + d) - sqrt(-b*f*log
(F))*log(c) - 1/2*sqrt(-b*f*log(F))/(b*f*n*log(F)))*e^(-1/4/(b*f*n^2*log(F)
) - 1)/(sqrt(-b*f*log(F))*c^(1/n)*n)
```

maple [F] time = 0.02, size = 0, normalized size = 0.00

$$\int F^{\left(b\ln\left(c(ex+d)^n\right)^2+a\right)f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^((b*ln(c*(e*x+d)^n)^2+a)*f),x)
```

```
[Out] int(F^((b*ln(c*(e*x+d)^n)^2+a)*f),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{\left(b\log\left((ex+d)^n c\right)^2+a\right)f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2)),x, algorithm="maxima")
```

```
[Out] integrate(F^((b*log((e*x + d)^n*c)^2 + a)*f), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int F^{b\,f\ln\left(c\,(d+e\,x)^n\right)^2}\,F^{a\,f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n)^2)),x)
```

```
[Out] int(F^(b*f*log(c*(d + e*x)^n)^2)*F^(a*f), x)
```

sympy [A] time = 29.05, size = 532, normalized size = 4.51

$$\begin{cases} -\frac{2F^{af}F^{bf\log(c)^2}F^{bfn^2\log(d+ex)^2}F^{2bfn\log(c)\log(d+ex)}bdfn^2\log(F)\log(d+ex)}{e} - \frac{2F^{af}F^{bf\log(c)^2}F^{bfn^2\log(d+ex)^2}F^{2bfn\log(c)\log(d+ex)}bdfn^2\log(F)}{e} \\ F^{f\left(a+b\log(cd^n)^2\right)}x \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n)**2)),x)
```

```
[Out] Piecewise((-2*F**(a*f)*F**(b*f*log(c)**2)*F**(b*f*n**2*log(d + e*x)**2)*F**
(2*b*f*n*log(c)*log(d + e*x))*b*d*f*n**2*log(F)*log(d + e*x)/e - 2*F**(a*f)
*F**(b*f*log(c)**2)*F**(b*f*n**2*log(d + e*x)**2)*F**(2*b*f*n*log(c)*log(d
+ e*x))*b*d*f*n**2*log(F)/e - 2*F**(a*f)*F**(b*f*log(c)**2)*F**(b*f*n**2*lo
g(d + e*x)**2)*F**(2*b*f*n*log(c)*log(d + e*x))*b*d*f*n*log(F)*log(c)/e - 2
*F**(a*f)*F**(b*f*log(c)**2)*F**(b*f*n**2*log(d + e*x)**2)*F**(2*b*f*n*log(
c)*log(d + e*x))*b*f*n**2*x*log(F)*log(d + e*x) + 2*F**(a*f)*F**(b*f*log(c)
**2)*F**(b*f*n**2*log(d + e*x)**2)*F**(2*b*f*n*log(c)*log(d + e*x))*b*f*n**
2*x*log(F) - 2*F**(a*f)*F**(b*f*log(c)**2)*F**(b*f*n**2*log(d + e*x)**2)*F*
*(2*b*f*n*log(c)*log(d + e*x))*b*f*n*x*log(F)*log(c) + F**(a*f)*F**(b*f*log
(c)**2)*F**(b*f*n**2*log(d + e*x)**2)*F**(2*b*f*n*log(c)*log(d + e*x))*d/e
+ F**(a*f)*F**(b*f*log(c)**2)*F**(b*f*n**2*log(d + e*x)**2)*F**(2*b*f*n*log
(c)*log(d + e*x))*x, Ne(e, 0)), (F**(f*(a + b*log(c*d**n)**2))*x, True))
```

3.599 $\int \frac{F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}}{g+hx}\,dx$

Optimal. Leaf size=31

$$\text{Int}\left(\frac{F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}}{g+hx},x\right)$$

```
[Out] Unintegrable(F^(f*(a+b*ln(c*(e*x+d)^n)^2))/(h*x+g),x)
```

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}}{g+hx}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n]^2))/(g + h*x),x]
```

```
[Out] Defer[Int][F^(f*(a + b*Log[c*(d + e*x)^n]^2))/(g + h*x), x]
```

Rubi steps

$$\int \frac{F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}}{g+hx}\,dx = \int \frac{F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}}{g+hx}\,dx$$

Mathematica [A] time = 0.52, size = 0, normalized size = 0.00

$$\int \frac{F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}}{g+hx}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n]^2))/(g + h*x),x]
```

```
[Out] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n]^2))/(g + h*x), x]
```

fricas [A] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{F^{bf\log\left((ex+d)^n c\right)^2+af}}{hx+g},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))/(h*x+g),x, algorithm="fricas")
[Out] integral(F^(b*f*log((e*x + d)^n*c)^2 + a*f)/(h*x + g), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{\left(b\log\left((ex+d)^n c\right)^2+a\right)f}}{hx+g}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))/(h*x+g),x, algorithm="giac")
[Out] integrate(F^((b*log((e*x + d)^n*c)^2 + a)*f)/(h*x + g), x)
```

maple [A] time = 0.53, size = 0, normalized size = 0.00

$$\int \frac{F^{\left(b\ln\left(c(ex+d)^n\right)^2+a\right)f}}{hx+g}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^((b*ln(c*(e*x+d)^n)^2+a)*f)/(h*x+g),x)
[Out] int(F^((b*ln(c*(e*x+d)^n)^2+a)*f)/(h*x+g),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{\left(b\log\left((ex+d)^n c\right)^2+a\right)f}}{hx+g}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))/(h*x+g),x, algorithm="maxima")
[Out] integrate(F^((b*log((e*x + d)^n*c)^2 + a)*f)/(h*x + g), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{e^{f\,\ln(F)\,\left(b\ln\left(c\,(d+e\,x)^n\right)^2+a\right)}}{g+h\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n)^2))/(g + h*x),x)
```

```
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n)^2))/(g + h*x), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{f\left(a+b\log\left(c(d+ex)^{n}\right)^{2}\right)}}{g+hx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n)**2))/(h*x+g),x)
```

```
[Out] Integral(F**(f*(a + b*log(c*(d + e*x)**n)**2))/(g + h*x), x)
```

3.600 $\int \frac{F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}}{(g+hx)^2}\,dx$

Optimal. Leaf size=31

$$\text{Int}\left(\frac{F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}}{(g+hx)^2},x\right)$$

```
[Out] Unintegrable(F^(f*(a+b*ln(c*(e*x+d)^n)^2))/(h*x+g)^2,x)
```

Rubi [A] time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}}{(g+hx)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n]^2))/(g + h*x)^2,x]
```

```
[Out] Defer[Int][F^(f*(a + b*Log[c*(d + e*x)^n]^2))/(g + h*x)^2, x]
```

Rubi steps

$$\int \frac{F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}}{(g+hx)^2}\,dx = \int \frac{F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}}{(g+hx)^2}\,dx$$

Mathematica [A] time = 2.63, size = 0, normalized size = 0.00

$$\int \frac{F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}}{(g+hx)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n]^2))/(g + h*x)^2,x]
```

```
[Out] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n]^2))/(g + h*x)^2, x]
```

fricas [A] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{F^{bf\log\left((ex+d)^n c\right)^2+af}}{h^2x^2+2\,ghx+g^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))/(h*x+g)^2,x, algorithm="fricas")

[Out] integral(F^(b*f*log((e*x + d)^n*c)^2 + a*f)/(h^2*x^2 + 2*g*h*x + g^2), x)

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{\left(b\log\left((ex+d)^n c\right)^2+a\right)f}}{\left(hx+g\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))/(h*x+g)^2,x, algorithm="giac")

[Out] integrate(F^((b*log((e*x + d)^n*c)^2 + a)*f)/(h*x + g)^2, x)

maple [A] time = 0.60, size = 0, normalized size = 0.00

$$\int \frac{F^{\left(b\ln\left(c(ex+d)^n\right)^2+a\right)f}}{\left(hx+g\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(F^((b*ln(c*(e*x+d)^n)^2+a)*f)/(h*x+g)^2,x)

[Out] int(F^((b*ln(c*(e*x+d)^n)^2+a)*f)/(h*x+g)^2,x)

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{\left(b\log\left((ex+d)^n c\right)^2+a\right)f}}{\left(hx+g\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))/(h*x+g)^2,x, algorithm="maxima")

[Out] integrate(F^((b*log((e*x + d)^n*c)^2 + a)*f)/(h*x + g)^2, x)

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{\mathrm{e}^{f\,\ln(F)\,\left(b\ln\left(c\,(d+e\,x)^n\right)^2+a\right)}}{\left(g+h\,x\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n)^2))/(g + h*x)^2,x)
```

```
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n)^2))/(g + h*x)^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n)**2))/(h*x+g)**2,x)
```

```
[Out] Timed out
```

3.601 $\int \frac{F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}}{(g+hx)^3}\,dx$

Optimal. Leaf size=31

$$\text{Int}\left(\frac{F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}}{(g+hx)^3},x\right)$$

```
[Out] Unintegrable(F^(f*(a+b*ln(c*(e*x+d)^n)^2))/(h*x+g)^3,x)
```

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}}{(g+hx)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n]^2))/(g + h*x)^3,x]
```

```
[Out] Defer[Int][F^(f*(a + b*Log[c*(d + e*x)^n]^2))/(g + h*x)^3, x]
```

Rubi steps

$$\int \frac{F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}}{(g+hx)^3}\,dx=\int \frac{F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}}{(g+hx)^3}\,dx$$

Mathematica [A] time = 3.42, size = 0, normalized size = 0.00

$$\int \frac{F^{f\left(a+b\log^2\left(c(d+ex)^n\right)\right)}}{(g+hx)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n]^2))/(g + h*x)^3,x]
```

```
[Out] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n]^2))/(g + h*x)^3, x]
```

fricas [A] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{F^{bf\log\left((ex+d)^n c\right)^2+af}}{h^3x^3+3\,gh^2x^2+3\,g^2hx+g^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))/(h*x+g)^3,x, algorithm="fricas")
```

```
[Out] integral(F^(b*f*log((e*x + d)^n*c)^2 + a*f)/(h^3*x^3 + 3*g*h^2*x^2 + 3*g^2*
h*x + g^3), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{\left(b\log\left((ex+d)^{n}c\right)^{2}+a\right)f}}{(hx+g)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))/(h*x+g)^3,x, algorithm="giac")
```

```
[Out] integrate(F^((b*log((e*x + d)^n*c)^2 + a)*f)/(h*x + g)^3, x)
```

maple [A] time = 0.85, size = 0, normalized size = 0.00

$$\int \frac{F^{\left(b\ln\left(c(ex+d)^{n}\right)^{2}+a\right)f}}{(hx+g)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^((b*ln(c*(e*x+d)^n)^2+a)*f)/(h*x+g)^3,x)
```

```
[Out] int(F^((b*ln(c*(e*x+d)^n)^2+a)*f)/(h*x+g)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{\left(b\log\left((ex+d)^{n}c\right)^{2}+a\right)f}}{(hx+g)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n)^2))/(h*x+g)^3,x, algorithm="maxima")
```

```
[Out] integrate(F^((b*log((e*x + d)^n*c)^2 + a)*f)/(h*x + g)^3, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{\mathrm{e}^{f\,\ln(F)\,\left(b\ln\left(c\,(d+e\,x)^{n}\right)^{2}+a\right)}}{\left(g+h\,x\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n)^2))/(g + h*x)^3,x)
```

```
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n)^2))/(g + h*x)^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n)**2))/(h*x+g)**3,x)
```

```
[Out] Timed out
```

3.602 $\int F^{f\left(a+b\log(c(d+ex)^n)\right)^2}(dg+egx)^m\,dx$

Optimal. Leaf size=153

$$\frac{\sqrt{\pi}F^{a^2f}(d+ex)(dg+egx)^m\left(c(d+ex)^n\right)^{-\frac{m+1}{n}}\exp\left(-\frac{(2abfn\log(F)+m+1)^2}{4b^2fn^2\log(F)}\right)\text{erfi}\left(\frac{2abfn\log(F)+2b^2fn\log(F)\log(c(d+ex)^n)+m+}{2b\sqrt{f}n\sqrt{\log(F)}}\right.}{2be\sqrt{f}n\sqrt{\log(F)}}$$

```
[Out] 1/2*F^(a^2*f)*(e*x+d)*(e*g*x+d*g)^m*erfi(1/2*(1+m+2*a*b*f*n*ln(F)+2*b^2*f*n
*ln(F)*ln(c*(e*x+d)^n))/b/n/f^(1/2)/ln(F)^(1/2))*Pi^(1/2)/b/e/exp(1/4*(1+m+
2*a*b*f*n*ln(F))^2/b^2/f/n^2/ln(F))/n/((c*(e*x+d)^n)^((1+m)/n))/f^(1/2)/ln(
F)^(1/2)
```

Rubi [A] time = 0.76, antiderivative size = 152, normalized size of antiderivative = 0.99, number of steps used = 8, number of rules used = 7, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.226, Rules used = {2278, 2274, 15, 20, 2276, 2234, 2204}

$$\frac{\sqrt{\pi}F^{a^2f}(d+ex)(g(d+ex))^m\left(c(d+ex)^n\right)^{-\frac{m+1}{n}}\exp\left(-\frac{(2abfn\log(F)+m+1)^2}{4b^2fn^2\log(F)}\right)\text{Erfi}\left(\frac{2abfn\log(F)+2b^2fn\log(F)\log(c(d+ex)^n)+m}{2b\sqrt{f}n\sqrt{\log(F)}}\right.}{2be\sqrt{f}n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n])^2)*(d*g + e*g*x)^m,x]
```

```
[Out] (F^(a^2*f)*Sqrt[Pi]*(d + e*x)*(g*(d + e*x))^m*Erfi[(1 + m + 2*a*b*f*n*Log[F
] + 2*b^2*f*n*Log[F]*Log[c*(d + e*x)^n])/(2*b*Sqrt[f]*n*Sqrt[Log[F]])])/(2*
b*e*E^((1 + m + 2*a*b*f*n*Log[F])^2/(4*b^2*f*n^2*Log[F]))*Sqrt[f]*n*(c*(d +
 e*x)^n)^((1 + m)/n)*Sqrt[Log[F]])
```

Rule 15

```
Int[(u_.)*((a_.)*(x_)^(n_))^(m_), x_Symbol] :> Dist[(a^IntPart[m]*(a*x^n)^F
racPart[m])/x^(n*FracPart[m]), Int[u*x^(m*n), x], x] /; FreeQ[{a, m, n}, x]
 && !IntegerQ[m]
```

Rule 20

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[(b^IntPart
[n]*(b*v)^FracPart[n])/(a^IntPart[n]*(a*v)^FracPart[n]), Int[u*(a*v)^(m + n
), x], x] /; FreeQ[{a, b, m, n}, x] && !IntegerQ[m] && !IntegerQ[n] && !
IntegerQ[m + n]
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2234

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2274

```
Int[(u_.)*(F_)^((a_.)*(Log[z_]*(b_.) + (v_.))), x_Symbol] :> Int[u*F^(a*v)*
z^(a*b*Log[F]), x] /; FreeQ[{F, a, b}, x]
```

Rule 2276

```
Int[(F_)^(((a_.) + Log[(c_.)*(x_)^(n_.)]^2*(b_.))*(d_.))*((e_.)*(x_))^(m_.)
, x_Symbol] :> Dist[(e*x)^(m + 1)/(e*n*(c*x^n)^((m + 1)/n)), Subst[Int[E^(a
*d*Log[F] + ((m + 1)*x)/n + b*d*Log[F]*x^2), x], x, Log[c*x^n]], x] /; Free
Q[{F, a, b, c, d, e, m, n}, x]
```

Rule 2278

```
Int[(F_)^(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^2*(d_.))*((e_.)*(x_))^(m_.)
, x_Symbol] :> Int[(e*x)^m*F^(a^2*d + 2*a*b*d*Log[c*x^n] + b^2*d*Log[c*x^n]
^2), x] /; FreeQ[{F, a, b, c, d, e, m, n}, x]
```

Rubi steps

$$\int F^{f\left(a+b\log(c(d+ex)^n)\right)^2}(dg+egx)^m\,dx = \frac{\text{Subst}\left(\int F^{f\left(a+b\log(cx^n)\right)^2}(gx)^m\,dx,x,d+ex\right)}{e}$$

$$= \frac{\text{Subst}\left(\int F^{a^2f+2abf\log(cx^n)+b^2f\log^2(cx^n)}(gx)^m\,dx,x,d+ex\right)}{e}$$

$$= \frac{\text{Subst}\left(\int F^{a^2f+b^2f\log^2(cx^n)}(gx)^m\,(cx^n)^{2abf\log(F)}\,dx,x,d+ex\right)}{e}$$

$$= \frac{\left((d+ex)^{-2abfn\log(F)}\,(c(d+ex)^n)^{2abf\log(F)}\right)\text{Subst}\left(\int F^{a^2f+b^2f\log^2(cx^n)}x^{2abf}\right.}{e}$$

$$= \frac{\left((d+ex)^{-m-2abfn\log(F)}(g(d+ex))^m\,(c(d+ex)^n)^{2abf\log(F)}\right)\text{Subst}\left(\int F^{a^2f+}\right.}{e}$$

$$= \frac{\left((d+ex)(g(d+ex))^m\,(c(d+ex)^n)^{2abf\log(F)-\frac{1+m+2abfn\log(F)}{n}}\right)\text{Subst}\left(\int\exp\right.}{en}$$

$$= \frac{\left(\exp\left(-\frac{(1+m+2abfn\log(F))^2}{4b^2fn^2\log(F)}\right)F^{a^2f}(d+ex)(g(d+ex))^m\,(c(d+ex)^n)^{2abf\log(F)}\right.}{}$$

$$= \frac{\exp\left(-\frac{(1+m+2abfn\log(F))^2}{4b^2fn^2\log(F)}\right)F^{a^2f}\sqrt{\pi}\,(d+ex)(g(d+ex))^m\,(c(d+ex)^n)^{-\frac{1+m}{n}}\,\mathrm{e}}{2be\sqrt{f}\,n\sqrt{\log(F)}}$$

Mathematica [F] time = 0.25, size = 0, normalized size = 0.00

$$\int F^{f\left(a+b\log(c(d+ex)^n)\right)^2}(dg+egx)^m\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n])^2)*(d*g + e*g*x)^m,x]
[Out] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n])^2)*(d*g + e*g*x)^m, x]
```

fricas [A] time = 0.42, size = 169, normalized size = 1.10

$$-\frac{\sqrt{\pi}\,\sqrt{-b^2fn^2\log(F)}\,\operatorname{erf}\left(\frac{\left(2\,b^2fn^2\log(ex+d)\log(F)+2\,b^2fn\log(F)\log(c)+2\,abfn\log(F)+m+1\right)\sqrt{-b^2fn^2\log(F)}}{2\,b^2fn^2\log(F)}\right)e^{\left(\frac{4\,b^2fmn^2\log(F)\log(g)-}{}\right.}}{2\,ben}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)*(e*g*x+d*g)^m,x, algorithm="fricas
")
```

```
[Out] -1/2*sqrt(pi)*sqrt(-b^2*f*n^2*log(F))*erf(1/2*(2*b^2*f*n^2*log(e*x + d)*log
(F) + 2*b^2*f*n*log(F)*log(c) + 2*a*b*f*n*log(F) + m + 1)*sqrt(-b^2*f*n^2*l
og(F))/(b^2*f*n^2*log(F)))*e^(1/4*(4*b^2*f*m*n^2*log(F)*log(g) - 4*(b^2*f*m
 + b^2*f)*n*log(F)*log(c) - 4*(a*b*f*m + a*b*f)*n*log(F) - m^2 - 2*m - 1)/(
b^2*f*n^2*log(F)))/(b*e*n)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(egx+dg\right)^{m} F^{\left(b\log\left((ex+d)^{n}c\right)+a\right)^{2}f}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)*(e*g*x+d*g)^m,x, algorithm="giac")
```

```
[Out] integrate((e*g*x + d*g)^m*F^((b*log((e*x + d)^n*c) + a)^2*f), x)
```

maple [F(-1)] time = 180.00, size = 0, normalized size = 0.00

$$\int F^{\left(b\ln\left(c(ex+d)^{n}\right)+a\right)^{2}f} \left(egx+dg\right)^{m}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a+b*ln(c*(e*x+d)^n))^2)*(e*g*x+d*g)^m,x)
```

```
[Out] int(F^(f*(a+b*ln(c*(e*x+d)^n))^2)*(e*g*x+d*g)^m,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(egx+dg\right)^{m} F^{\left(b\log\left((ex+d)^{n}c\right)+a\right)^{2}f}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)*(e*g*x+d*g)^m,x, algorithm="maxima
")
```

```
[Out] integrate((e*g*x + d*g)^m*F^((b*log((e*x + d)^n*c) + a)^2*f), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int {\mathrm{e}}^{f\,\ln(F)\,{\left(a+b\,\ln\left(c\,{(d+e\,x)}^n\right)\right)}^2}\,{\left(d\,g+e\,g\,x\right)}^m \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n))^2)*(d*g + e*g*x)^m,x)
```

```
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n))^2)*(d*g + e*g*x)^m, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n))**2)*(e*g*x+d*g)**m,x)
```

```
[Out] Timed out
```

3.603 $\int F^{f\left(a+b\log\left(c(d+ex)^n\right)\right)^2}(dg+egx)^2\,dx$

Optimal. Leaf size=133

$$\frac{\sqrt{\pi}\,g^2(d+ex)^3\left(c(d+ex)^n\right)^{-3/n}\exp\left(-\frac{3(4abfn\log(F)+3)}{4b^2fn^2\log(F)}\right)\operatorname{erfi}\left(\frac{2abf\log(F)+2b^2f\log(F)\log\left(c(d+ex)^n\right)+\frac{3}{n}}{2b\sqrt{f}\sqrt{\log(F)}}\right)}{2be\sqrt{f}\,n\sqrt{\log(F)}}$$

```
[Out] 1/2*g^2*(e*x+d)^3*erfi(1/2*(3/n+2*a*b*f*ln(F)+2*b^2*f*ln(F)*ln(c*(e*x+d)^n)
)/b/f^(1/2)/ln(F)^(1/2))*Pi^(1/2)/b/e/exp(3/4*(3+4*a*b*f*n*ln(F))/b^2/f/n^2
/ln(F))/n/((c*(e*x+d)^n)^(3/n))/f^(1/2)/ln(F)^(1/2)
```

Rubi [A] time = 0.41, antiderivative size = 133, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.226, Rules used = {12, 2278, 2274, 15, 2276, 2234, 2204}

$$\frac{\sqrt{\pi}\,g^2(d+ex)^3\left(c(d+ex)^n\right)^{-3/n}\exp\left(-\frac{3(4abfn\log(F)+3)}{4b^2fn^2\log(F)}\right)\text{Erfi}\left(\frac{2abf\log(F)+2b^2f\log(F)\log\left(c(d+ex)^n\right)+\frac{3}{n}}{2b\sqrt{f}\sqrt{\log(F)}}\right)}{2be\sqrt{f}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n])^2)*(d*g + e*g*x)^2,x]
```

```
[Out] (g^2*Sqrt[Pi]*(d + e*x)^3*Erfi[(3/n + 2*a*b*f*Log[F] + 2*b^2*f*Log[F]*Log[c
*(d + e*x)^n])/(2*b*Sqrt[f]*Sqrt[Log[F]])])/(2*b*e*E^((3*(3 + 4*a*b*f*n*Log
[F]))/(4*b^2*f*n^2*Log[F]))*Sqrt[f]*n*(c*(d + e*x)^n)^(3/n)*Sqrt[Log[F]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 15

```
Int[(u_.)*((a_.)*(x_)^(n_))^(m_), x_Symbol] :> Dist[(a^IntPart[m]*(a*x^n)^F
racPart[m])/x^(n*FracPart[m]), Int[u*x^(m*n), x], x] /; FreeQ[{a, m, n}, x]
 &&  !IntegerQ[m]
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2234

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2274

```
Int[(u_.)*(F_)^((a_.)*(Log[z_]*(b_.) + (v_.))), x_Symbol] :> Int[u*F^(a*v)*
z^(a*b*Log[F]), x] /; FreeQ[{F, a, b}, x]
```

Rule 2276

```
Int[(F_)^(((a_.) + Log[(c_.)*(x_)^(n_.)]^2*(b_.))*(d_.))*((e_.)*(x_))^(m_.)
, x_Symbol] :> Dist[(e*x)^(m + 1)/(e*n*(c*x^n)^((m + 1)/n)), Subst[Int[E^(a
*d*Log[F] + ((m + 1)*x)/n + b*d*Log[F]*x^2), x], x, Log[c*x^n]], x] /; Free
Q[{F, a, b, c, d, e, m, n}, x]
```

Rule 2278

```
Int[(F_)^(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^2*(d_.))*((e_.)*(x_))^(m_.)
, x_Symbol] :> Int[(e*x)^m*F^(a^2*d + 2*a*b*d*Log[c*x^n] + b^2*d*Log[c*x^n]
^2), x] /; FreeQ[{F, a, b, c, d, e, m, n}, x]
```

Rubi steps

$$\int F^{f\left(a+b\log(c(d+ex)^n)\right)^2}(dg+egx)^2\,dx = \frac{\text{Subst}\left(\int F^{f\left(a+b\log(cx^n)\right)^2}g^2x^2\,dx,x,d+ex\right)}{e}$$
$$= \frac{g^2\,\text{Subst}\left(\int F^{f\left(a+b\log(cx^n)\right)^2}x^2\,dx,x,d+ex\right)}{e}$$
$$= \frac{g^2\,\text{Subst}\left(\int F^{a^2f+2abf\log(cx^n)+b^2f\log^2(cx^n)}x^2\,dx,x,d+ex\right)}{e}$$
$$= \frac{g^2\,\text{Subst}\left(\int F^{a^2f+b^2f\log^2(cx^n)}x^2\,(cx^n)^{2abf\log(F)}\,dx,x,d+ex\right)}{e}$$
$$= \frac{\left(g^2(d+ex)^{-2abfn\log(F)}\,(c(d+ex)^n)^{2abf\log(F)}\right)\text{Subst}\left(\int F^{a^2f+b^2f\log^2(cx^n)}x^{2+2}\right.}{e}$$
$$= \frac{\left(g^2(d+ex)^3\,(c(d+ex)^n)^{2abf\log(F)-\frac{3+2abfn\log(F)}{n}}\right)\text{Subst}\left(\int\exp\left(a^2f\log(F)+\right.\right.}{en}$$
$$= \frac{\left(\exp\left(a^2f\log(F)-\frac{(3+2abfn\log(F))^2}{4b^2fn^2\log(F)}\right)g^2(d+ex)^3\,(c(d+ex)^n)^{2abf\log(F)-\frac{3+2abf}{n}}\right.}{en}$$
$$= \frac{\exp\left(-\frac{3(3+4abfn\log(F))}{4b^2fn^2\log(F)}\right)g^2\sqrt{\pi}\,(d+ex)^3\,(c(d+ex)^n)^{-3/n}\,\text{erfi}\left(\frac{\frac{3}{n}+2abf\log(F)+2b}{2b\sqrt{f}}\right.}{2be\sqrt{f}\,n\sqrt{\log(F)}}$$

Mathematica [A] time = 0.36, size = 129, normalized size = 0.97

$$\frac{\sqrt{\pi}\,g^2\text{erfi}\left(\frac{2bfn\log(F)\left(a+b\log(c(d+ex)^n)\right)+3}{2b\sqrt{f}\,n\sqrt{\log(F)}}\right)\exp\left(-\frac{3\left(4bfn\log(F)\left(a+b\left(\log(c(d+ex)^n)-n\log(d+ex)\right)\right)+3\right)}{4b^2fn^2\log(F)}\right)}{2be\sqrt{f}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n])^2)*(d*g + e*g*x)^2,x]
```

```
[Out] (g^2*Sqrt[Pi]*Erfi[(3 + 2*b*f*n*Log[F]*(a + b*Log[c*(d + e*x)^n]))/(2*b*Sqr
t[f]*n*Sqrt[Log[F]])])/(2*b*e*E^((3*(3 + 4*b*f*n*Log[F]*(a + b*(-(n*Log[d +
 e*x]) + Log[c*(d + e*x)^n]))))/(4*b^2*f*n^2*Log[F]))*Sqrt[f]*n*Sqrt[Log[F]
])
```

fricas [A] time = 0.42, size = 134, normalized size = 1.01

$$-\frac{\sqrt{\pi}\sqrt{-b^2fn^2\log(F)}g^2\operatorname{erf}\left(\frac{\left(2b^2fn^2\log(ex+d)\log(F)+2b^2fn\log(F)\log(c)+2abfn\log(F)+3\right)\sqrt{-b^2fn^2\log(F)}}{2b^2fn^2\log(F)}\right)e^{\left(-\frac{3\left(4b^2fn\log(F)\log(c)\cdots\right.}{4b^2fn^2\log\cdots}\right.}}{2ben}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)*(e*g*x+d*g)^2,x, algorithm="fricas
")
```

```
[Out] -1/2*sqrt(pi)*sqrt(-b^2*f*n^2*log(F))*g^2*erf(1/2*(2*b^2*f*n^2*log(e*x + d)
*log(F) + 2*b^2*f*n*log(F)*log(c) + 2*a*b*f*n*log(F) + 3)*sqrt(-b^2*f*n^2*l
og(F))/(b^2*f*n^2*log(F)))*e^(-3/4*(4*b^2*f*n*log(F)*log(c) + 4*a*b*f*n*log
(F) + 3)/(b^2*f*n^2*log(F)))/(b*e*n)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\left(egx+dg\right)^2F^{\left(b\log\left((ex+d)^nc\right)+a\right)^2f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)*(e*g*x+d*g)^2,x, algorithm="giac")
```

```
[Out] integrate((e*g*x + d*g)^2*F^((b*log((e*x + d)^n*c) + a)^2*f), x)
```

maple [F] time = 0.59, size = 0, normalized size = 0.00

$$\int\left(egx+dg\right)^2F^{\left(b\ln\left(c(ex+d)^n\right)+a\right)^2f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^((b*ln(c*(e*x+d)^n)+a)^2*f)*(e*g*x+d*g)^2,x)
```

```
[Out] int(F^((b*ln(c*(e*x+d)^n)+a)^2*f)*(e*g*x+d*g)^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\left(egx+dg\right)^2F^{\left(b\log\left((ex+d)^nc\right)+a\right)^2f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)*(e*g*x+d*g)^2,x, algorithm="maxima
")
```

```
[Out] integrate((e*g*x + d*g)^2*F^((b*log((e*x + d)^n*c) + a)^2*f), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int e^{f\,\ln(F)\left(a+b\,\ln\left(c\,(d+e\,x)^n\right)\right)^2}\left(d\,g+e\,g\,x\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n))^2)*(d*g + e*g*x)^2,x)
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n))^2)*(d*g + e*g*x)^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n))**2)*(e*g*x+d*g)**2,x)
[Out] Timed out
```

3.604 $\int F^{f\left(a+b\log(c(d+ex)^n)\right)^2}(dg+egx)\,dx$

Optimal. Leaf size=122

$$\frac{\sqrt{\pi}\,g(d+ex)^2\left(c(d+ex)^n\right)^{-2/n}e^{-\frac{2abfn\log(F)+1}{b^2fn^2\log(F)}}\operatorname{erfi}\left(\frac{abf\log(F)+b^2f\log(F)\log(c(d+ex)^n)+\frac{1}{n}}{b\sqrt{f}\sqrt{\log(F)}}\right)}{2be\sqrt{f}\,n\sqrt{\log(F)}}$$

```
[Out] 1/2*g*(e*x+d)^2*erfi((1/n+a*b*f*ln(F)+b^2*f*ln(F)*ln(c*(e*x+d)^n))/b/f^(1/2
)/ln(F)^(1/2))*Pi^(1/2)/b/e/exp((1+2*a*b*f*n*ln(F))/b^2/f/n^2/ln(F))/n/((c*
(e*x+d)^n)^(2/n))/f^(1/2)/ln(F)^(1/2)
```

Rubi [A] time = 0.37, antiderivative size = 122, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.241, Rules used = {12, 2278, 2274, 15, 2276, 2234, 2204}

$$\frac{\sqrt{\pi}\,g(d+ex)^2\left(c(d+ex)^n\right)^{-2/n}e^{-\frac{2abfn\log(F)+1}{b^2fn^2\log(F)}}\operatorname{Erfi}\left(\frac{abf\log(F)+b^2f\log(F)\log(c(d+ex)^n)+\frac{1}{n}}{b\sqrt{f}\sqrt{\log(F)}}\right)}{2be\sqrt{f}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n])^2)*(d*g + e*g*x),x]
```

```
[Out] (g*Sqrt[Pi]*(d + e*x)^2*Erfi[(n^(-1) + a*b*f*Log[F] + b^2*f*Log[F]*Log[c*(d
 + e*x)^n])/(b*Sqrt[f]*Sqrt[Log[F]])])/(2*b*e*E^((1 + 2*a*b*f*n*Log[F])/(b^
2*f*n^2*Log[F]))*Sqrt[f]*n*(c*(d + e*x)^n)^(2/n)*Sqrt[Log[F]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 15

```
Int[(u_.)*((a_.)*(x_)^(n_))^(m_), x_Symbol] :> Dist[(a^IntPart[m]*(a*x^n)^F
racPart[m])/x^(n*FracPart[m]), Int[u*x^(m*n), x], x] /; FreeQ[{a, m, n}, x]
 &&  !IntegerQ[m]
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
```

```
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2234

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2274

```
Int[(u_.)*(F_)^((a_.)*(Log[z_]*(b_.) + (v_.))), x_Symbol] :> Int[u*F^(a*v)*
z^(a*b*Log[F]), x] /; FreeQ[{F, a, b}, x]
```

Rule 2276

```
Int[(F_)^(((a_.) + Log[(c_.)*(x_)^(n_.)]^2*(b_.))*(d_.))*((e_.)*(x_))^(m_.)
, x_Symbol] :> Dist[(e*x)^(m + 1)/(e*n*(c*x^n)^((m + 1)/n)), Subst[Int[E^(a
*d*Log[F] + ((m + 1)*x)/n + b*d*Log[F]*x^2), x], x, Log[c*x^n]], x] /; Free
Q[{F, a, b, c, d, e, m, n}, x]
```

Rule 2278

```
Int[(F_)^(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^2*(d_.))*((e_.)*(x_))^(m_.)
, x_Symbol] :> Int[(e*x)^m*F^(a^2*d + 2*a*b*d*Log[c*x^n] + b^2*d*Log[c*x^n]
^2), x] /; FreeQ[{F, a, b, c, d, e, m, n}, x]
```

Rubi steps

$$\int F^{f\left(a+b\log(c(d+ex)^n)\right)^2}(dg+egx)\,dx = \frac{\text{Subst}\left(\int F^{f\left(a+b\log(cx^n)\right)^2}gx\,dx,x,d+ex\right)}{e}$$
$$= \frac{g\,\text{Subst}\left(\int F^{f\left(a+b\log(cx^n)\right)^2}x\,dx,x,d+ex\right)}{e}$$
$$= \frac{g\,\text{Subst}\left(\int F^{a^2f+2abf\log(cx^n)+b^2f\log^2(cx^n)}x\,dx,x,d+ex\right)}{e}$$
$$= \frac{g\,\text{Subst}\left(\int F^{a^2f+b^2f\log^2(cx^n)}x\,(cx^n)^{2abf\log(F)}\,dx,x,d+ex\right)}{e}$$
$$= \frac{\left(g(d+ex)^{-2abfn\log(F)}\,(c(d+ex)^n)^{2abf\log(F)}\right)\text{Subst}\left(\int F^{a^2f+b^2f\log^2(cx^n)}x^{1+2a}\right.}{e}$$
$$= \frac{\left(g(d+ex)^2\,(c(d+ex)^n)^{2abf\log(F)-\frac{2+2abfn\log(F)}{n}}\right)\text{Subst}\left(\int\exp\left(a^2f\log(F)+\right.\right.}{en}$$
$$= \frac{\left(\exp\left(a^2f\log(F)-\frac{(2+2abfn\log(F))^2}{4b^2fn^2\log(F)}\right)g(d+ex)^2\,(c(d+ex)^n)^{2abf\log(F)-\frac{2+2abfn}{n}}\right.}{en}$$
$$= \frac{e^{-\frac{1+2abfn\log(F)}{b^2fn^2\log(F)}}g\sqrt{\pi}\,(d+ex)^2\,(c(d+ex)^n)^{-2/n}\,\text{erfi}\left(\frac{\frac{1}{n}+abf\log(F)+b^2f\log(F)\log(c(d\right.}{b\sqrt{f}\,\sqrt{\log(F)}}}{2be\sqrt{f}\,n\sqrt{\log(F)}}$$

Mathematica [A] time = 0.73, size = 120, normalized size = 0.98

$$\frac{\sqrt{\pi}\,g(d+ex)^2\,(c(d+ex)^n)^{-2/n}\,e^{-\frac{2abfn\log(F)+1}{b^2fn^2\log(F)}}\,\text{erfi}\left(\frac{bfn\log(F)\left(a+b\log\left(c(d+ex)^n\right)\right)+1}{b\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2be\sqrt{f}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n])^2)*(d*g + e*g*x),x]
```

```
[Out] (g*Sqrt[Pi]*(d + e*x)^2*Erfi[(1 + b*f*n*Log[F]*(a + b*Log[c*(d + e*x)^n]))/
(b*Sqrt[f]*n*Sqrt[Log[F]])])/(2*b*e*E^((1 + 2*a*b*f*n*Log[F])/(b^2*f*n^2*Lo
g[F]))*Sqrt[f]*n*(c*(d + e*x)^n)^(2/n)*Sqrt[Log[F]])
```

fricas [A] time = 0.42, size = 128, normalized size = 1.05

$$-\frac{\sqrt{\pi}\sqrt{-b^2fn^2\log(F)}\,g\,\mathrm{erf}\left(\frac{\left(b^2fn^2\log(ex+d)\log(F)+b^2fn\log(F)\log(c)+abfn\log(F)+1\right)\sqrt{-b^2fn^2\log(F)}}{b^2fn^2\log(F)}\right)e^{\left(-\frac{2b^2fn\log(F)\log(c)+2abfn\log(F)+1}{b^2fn^2\log(F)}\right)}}{2ben}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)*(e*g*x+d*g),x, algorithm="fricas")
```

```
[Out] -1/2*sqrt(pi)*sqrt(-b^2*f*n^2*log(F))*g*erf((b^2*f*n^2*log(e*x + d)*log(F)
+ b^2*f*n*log(F)*log(c) + a*b*f*n*log(F) + 1)*sqrt(-b^2*f*n^2*log(F))/(b^2*
f*n^2*log(F)))*e^(-(2*b^2*f*n*log(F)*log(c) + 2*a*b*f*n*log(F) + 1)/(b^2*f*
n^2*log(F)))/(b*e*n)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (egx+dg)F^{\left(b\log\left((ex+d)^nc\right)+a\right)^2f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)*(e*g*x+d*g),x, algorithm="giac")
```

```
[Out] integrate((e*g*x + d*g)*F^((b*log((e*x + d)^n*c) + a)^2*f), x)
```

maple [F] time = 0.61, size = 0, normalized size = 0.00

$$\int (egx+dg)\,F^{\left(b\ln\left(c(ex+d)^n\right)+a\right)^2f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^((b*ln(c*(e*x+d)^n)+a)^2*f)*(e*g*x+d*g),x)
```

```
[Out] int(F^((b*ln(c*(e*x+d)^n)+a)^2*f)*(e*g*x+d*g),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (egx+dg)F^{\left(b\log\left((ex+d)^nc\right)+a\right)^2f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)*(e*g*x+d*g),x, algorithm="maxima")
```

```
[Out] integrate((e*g*x + d*g)*F^((b*log((e*x + d)^n*c) + a)^2*f), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \mathrm{e}^{f\,\ln(F)\,\left(a+b\,\ln\left(c\,(d+e\,x)^n\right)\right)^2}\,\left(d\,g+e\,g\,x\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n))^2)*(d*g + e*g*x),x)
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n))^2)*(d*g + e*g*x), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n))**2)*(e*g*x+d*g),x)
[Out] Timed out
```

3.605 $\int F^{f\left(a+b\log\left(c(d+ex)^n\right)\right)^2}\,dx$

Optimal. Leaf size=126

$$\frac{\sqrt{\pi}\,(d+ex)\left(c(d+ex)^n\right)^{-1/n} e^{-\frac{4abfn\log(F)+1}{4b^2fn^2\log(F)}}\operatorname{erfi}\left(\frac{2abf\log(F)+2b^2f\log(F)\log\left(c(d+ex)^n\right)+\frac{1}{n}}{2b\sqrt{f}\,\sqrt{\log(F)}}\right)}{2be\sqrt{f}\,n\sqrt{\log(F)}}$$

```
[Out] 1/2*(e*x+d)*erfi(1/2*(1/n+2*a*b*f*ln(F)+2*b^2*f*ln(F)*ln(c*(e*x+d)^n))/b/f^
(1/2)/ln(F)^(1/2))*Pi^(1/2)/b/e/exp(1/4*(1+4*a*b*f*n*ln(F))/b^2/f/n^2/ln(F)
)/n/((c*(e*x+d)^n)^(1/n))/f^(1/2)/ln(F)^(1/2)
```

Rubi [A] time = 0.23, antiderivative size = 126, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.300, Rules used = {2277, 2274, 15, 2276, 2234, 2204}

$$\frac{\sqrt{\pi}\,(d+ex)\left(c(d+ex)^n\right)^{-1/n} e^{-\frac{4abfn\log(F)+1}{4b^2fn^2\log(F)}}\operatorname{Erfi}\left(\frac{2abf\log(F)+2b^2f\log(F)\log\left(c(d+ex)^n\right)+\frac{1}{n}}{2b\sqrt{f}\,\sqrt{\log(F)}}\right)}{2be\sqrt{f}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n])^2),x]
```

```
[Out] (Sqrt[Pi]*(d + e*x)*Erfi[(n^(-1) + 2*a*b*f*Log[F] + 2*b^2*f*Log[F]*Log[c*(d
 + e*x)^n])/(2*b*Sqrt[f]*Sqrt[Log[F]])])/(2*b*e*E^((1 + 4*a*b*f*n*Log[F])/(
4*b^2*f*n^2*Log[F]))*Sqrt[f]*n*(c*(d + e*x)^n)^n^(-1)*Sqrt[Log[F]])
```

Rule 15

```
Int[(u_.)*((a_.)*(x_)^(n_))^(m_), x_Symbol] :> Dist[(a^IntPart[m]*(a*x^n)^F
racPart[m])/x^(n*FracPart[m]), Int[u*x^(m*n), x], x] /; FreeQ[{a, m, n}, x]
 && !IntegerQ[m]
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2234

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2274

```
Int[(u_.)*(F_)^((a_.)*(Log[z_]*(b_.) + (v_.))), x_Symbol] :> Int[u*F^(a*v)*
z^(a*b*Log[F]), x] /; FreeQ[{F, a, b}, x]
```

Rule 2276

```
Int[(F_)^(((a_.) + Log[(c_.)*(x_)^(n_.)]^2*(b_.))*(d_.))*((e_.)*(x_))^(m_.)
, x_Symbol] :> Dist[(e*x)^(m + 1)/(e*n*(c*x^n)^((m + 1)/n)), Subst[Int[E^(a
*d*Log[F] + ((m + 1)*x)/n + b*d*Log[F]*x^2), x], x, Log[c*x^n]], x] /; Free
Q[{F, a, b, c, d, e, m, n}, x]
```

Rule 2277

```
Int[(F_)^(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^2*(d_.)), x_Symbol] :> Int[
F^(a^2*d + 2*a*b*d*Log[c*x^n] + b^2*d*Log[c*x^n]^2), x] /; FreeQ[{F, a, b,
c, d, n}, x]
```

Rubi steps

$$\int F^{f\left(a+b\log\left(c(d+ex)^n\right)\right)^2}dx = \frac{\text{Subst}\left(\int F^{f\left(a+b\log(cx^n)\right)^2}dx, x, d+ex\right)}{e}$$

$$= \frac{\text{Subst}\left(\int F^{a^2f+2abf\log(cx^n)+b^2f\log^2(cx^n)}dx, x, d+ex\right)}{e}$$

$$= \frac{\text{Subst}\left(\int F^{a^2f+b^2f\log^2(cx^n)}(cx^n)^{2abf\log(F)}\,dx, x, d+ex\right)}{e}$$

$$= \frac{\left((d+ex)^{-2abfn\log(F)}(c(d+ex)^n)^{2abf\log(F)}\right)\text{Subst}\left(\int F^{a^2f+b^2f\log^2(cx^n)}x^{2abfn\log(F)}dx, x, d\right.}{e}$$

$$= \frac{\left((d+ex)\,(c(d+ex)^n)^{2abf\log(F)-\frac{1+2abfn\log(F)}{n}}\right)\text{Subst}\left(\int \exp\left(a^2f\log(F)+b^2fx^2\log(F)\right.\right.}{en}$$

$$= \frac{\left(\exp\left(a^2f\log(F)-\frac{(1+2abfn\log(F))^2}{4b^2fn^2\log(F)}\right)(d+ex)\,(c(d+ex)^n)^{2abf\log(F)-\frac{1+2abfn\log(F)}{n}}\right)\text{Subst}\left(\right.}{en}$$

$$= \frac{e^{-\frac{1+4abfn\log(F)}{4b^2fn^2\log(F)}}\sqrt{\pi}\,(d+ex)\,(c(d+ex)^n)^{-1/n}\,\text{erfi}\left(\frac{\frac{1}{n}+2abf\log(F)+2b^2f\log(F)\log(c(d+ex)^n)}{2b\sqrt{f}\sqrt{\log(F)}}\right)}{2be\sqrt{f}\,n\sqrt{\log(F)}}$$

Mathematica [A] time = 0.10, size = 123, normalized size = 0.98

$$\frac{\sqrt{\pi}\,(d+ex)\,(c(d+ex)^n)^{-1/n}\,e^{-\frac{4abfn\log(F)+1}{4b^2fn^2\log(F)}}\,\text{erfi}\left(\frac{2bfn\log(F)\left(a+b\log(c(d+ex)^n)\right)+1}{2b\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2be\sqrt{f}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n])^2),x]
```

```
[Out] (Sqrt[Pi]*(d + e*x)*Erfi[(1 + 2*b*f*n*Log[F]*(a + b*Log[c*(d + e*x)^n]))/(2
*b*Sqrt[f]*n*Sqrt[Log[F]])])/(2*b*e*E^((1 + 4*a*b*f*n*Log[F])/(4*b^2*f*n^2*
Log[F]))*Sqrt[f]*n*(c*(d + e*x)^n)^n^(-1)*Sqrt[Log[F]])
```

fricas [A] time = 0.43, size = 131, normalized size = 1.04

$$-\frac{\sqrt{\pi}\sqrt{-b^2fn^2\log(F)}\,\text{erf}\left(\frac{\left(2\,b^2fn^2\log(ex+d)\log(F)+2\,b^2fn\log(F)\log(c)+2\,abfn\log(F)+1\right)\sqrt{-b^2fn^2\log(F)}}{2\,b^2fn^2\log(F)}\right)e^{\left(-\frac{4\,b^2fn\log(F)\log(c)+4\,abfn1}{4\,b^2fn^2\log(F)}\right.}}{2\,ben}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2),x, algorithm="fricas")
```

```
[Out] -1/2*sqrt(pi)*sqrt(-b^2*f*n^2*log(F))*erf(1/2*(2*b^2*f*n^2*log(e*x + d)*log
(F) + 2*b^2*f*n*log(F)*log(c) + 2*a*b*f*n*log(F) + 1)*sqrt(-b^2*f*n^2*log(F
))/(b^2*f*n^2*log(F)))*e^(-1/4*(4*b^2*f*n*log(F)*log(c) + 4*a*b*f*n*log(F)
+ 1)/(b^2*f*n^2*log(F)))/(b*e*n)
```

giac [A] time = 0.55, size = 116, normalized size = 0.92

$$-\frac{\sqrt{\pi}\,\operatorname{erf}\left(-\sqrt{-f\log(F)}\,bn\log\left(xe+d\right)-\sqrt{-f\log(F)}\,b\log(c)-\sqrt{-f\log(F)}\,a-\frac{\sqrt{-f\log(F)}}{2\,bfn\log(F)}\right)e^{\left(-\frac{a}{bn}-\frac{1}{4\,b^{2}fn^{2}\log(F)}-1\right)}}{2\,\sqrt{-f\log(F)}\,bc^{\left(\frac{1}{n}\right)}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2),x, algorithm="giac")
```

```
[Out] -1/2*sqrt(pi)*erf(-sqrt(-f*log(F))*b*n*log(x*e + d) - sqrt(-f*log(F))*b*log
(c) - sqrt(-f*log(F))*a - 1/2*sqrt(-f*log(F))/(b*f*n*log(F)))*e^(-a/(b*n) -
 1/4/(b^2*f*n^2*log(F)) - 1)/(sqrt(-f*log(F))*b*c^(1/n)*n)
```

maple [F] time = 0.33, size = 0, normalized size = 0.00

$$\int F^{\left(b\ln\left(c(ex+d)^{n}\right)+a\right)^{2}f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^((b*ln(c*(e*x+d)^n)+a)^2*f),x)
```

```
[Out] int(F^((b*ln(c*(e*x+d)^n)+a)^2*f),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{\left(b\log\left((ex+d)^{n}c\right)+a\right)^{2}f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2),x, algorithm="maxima")
```

```
[Out] integrate(F^((b*log((e*x + d)^n*c) + a)^2*f), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \mathrm{e}^{f\,\ln(F)\,\left(a+b\,\ln\left(c\,(d+e\,x)^{n}\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n))^2),x)
```

```
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n))^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{f\left(a+b\log\left(c(d+ex)^{n}\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n))**2),x)
```

```
[Out] Integral(F**(f*(a + b*log(c*(d + e*x)**n))**2), x)
```

3.606 $\int \frac{F^{f\left(a+b\log\left(c(d+ex)^n\right)\right)^2}}{dg+egx}\,dx$

Optimal. Leaf size=70

$$\frac{\sqrt{\pi}\,\mathrm{erfi}\left(a\sqrt{f}\,\sqrt{\log(F)}\,+b\sqrt{f}\,\sqrt{\log(F)}\,\log\left(c(d+ex)^n\right)\right)}{2be\sqrt{f}\,gn\sqrt{\log(F)}}$$

```
[Out] 1/2*erfi(a*f^(1/2)*ln(F)^(1/2)+b*ln(c*(e*x+d)^n)*f^(1/2)*ln(F)^(1/2))*Pi^(1
/2)/b/e/g/n/f^(1/2)/ln(F)^(1/2)
```

Rubi [A] time = 0.27, antiderivative size = 70, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.226, Rules used = {12, 2278, 2274, 15, 2276, 2234, 2204}

$$\frac{\sqrt{\pi}\,\mathrm{Erfi}\left(a\sqrt{f}\,\sqrt{\log(F)}\,+b\sqrt{f}\,\sqrt{\log(F)}\,\log\left(c(d+ex)^n\right)\right)}{2be\sqrt{f}\,gn\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n])^2)/(d*g + e*g*x),x]
```

```
[Out] (Sqrt[Pi]*Erfi[a*Sqrt[f]*Sqrt[Log[F]] + b*Sqrt[f]*Sqrt[Log[F]]*Log[c*(d + e
*x)^n]])/(2*b*e*Sqrt[f]*g*n*Sqrt[Log[F]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 15

```
Int[(u_.)*((a_.)*(x_)^(n_))^(m_), x_Symbol] :> Dist[(a^IntPart[m]*(a*x^n)^F
racPart[m])/x^(n*FracPart[m]), Int[u*x^(m*n), x], x] /; FreeQ[{a, m, n}, x]
 &&  !IntegerQ[m]
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2234

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2274

```
Int[(u_.)*(F_)^((a_.)*(Log[z_]*(b_.) + (v_.))), x_Symbol] :> Int[u*F^(a*v)*
z^(a*b*Log[F]), x] /; FreeQ[{F, a, b}, x]
```

Rule 2276

```
Int[(F_)^(((a_.) + Log[(c_.)*(x_)^(n_.)]^2*(b_.))*(d_.))*((e_.)*(x_))^(m_.)
, x_Symbol] :> Dist[(e*x)^(m + 1)/(e*n*(c*x^n)^((m + 1)/n)), Subst[Int[E^(a
*d*Log[F] + ((m + 1)*x)/n + b*d*Log[F]*x^2), x], x, Log[c*x^n]], x] /; Free
Q[{F, a, b, c, d, e, m, n}, x]
```

Rule 2278

```
Int[(F_)^(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^2*(d_.))*((e_.)*(x_))^(m_.)
, x_Symbol] :> Int[(e*x)^m*F^(a^2*d + 2*a*b*d*Log[c*x^n] + b^2*d*Log[c*x^n]
^2), x] /; FreeQ[{F, a, b, c, d, e, m, n}, x]
```

Rubi steps

$$
\begin{aligned}
\int \frac{F^{f\left(a+b\log\left(c(d+ex)^n\right)\right)^2}}{dg+egx}\,dx &= \frac{\text{Subst}\left(\int \frac{F^{f\left(a+b\log\left(cx^n\right)\right)^2}}{gx}\,dx,x,d+ex\right)}{e} \\
&= \frac{\text{Subst}\left(\int \frac{F^{f\left(a+b\log\left(cx^n\right)\right)^2}}{x}\,dx,x,d+ex\right)}{eg} \\
&= \frac{\text{Subst}\left(\int \frac{F^{a^2f+2abf\log\left(cx^n\right)+b^2f\log^2\left(cx^n\right)}}{x}\,dx,x,d+ex\right)}{eg} \\
&= \frac{\text{Subst}\left(\int \frac{F^{a^2f+b^2f\log^2\left(cx^n\right)}\left(cx^n\right)^{2abf\log(F)}}{x}\,dx,x,d+ex\right)}{eg} \\
&= \frac{\left((d+ex)^{-2abfn\log(F)}\left(c(d+ex)^n\right)^{2abf\log(F)}\right)\text{Subst}\left(\int F^{a^2f+b^2f\log^2(cx^n)}x^{-1+2abfn\log(F)}\,d\right.}{eg} \\
&= \frac{\text{Subst}\left(\int \exp\left(a^2f\log(F)+2abfx\log(F)+b^2fx^2\log(F)\right)\,dx,x,\log\left(c(d+ex)^n\right)\right)}{egn} \\
&= \frac{\text{Subst}\left(\int \exp\left(\frac{\left(2abf\log(F)+2b^2fx\log(F)\right)^2}{4b^2f\log(F)}\right)\,dx,x,\log\left(c(d+ex)^n\right)\right)}{egn} \\
&= \frac{\sqrt{\pi}\,\text{erfi}\left(a\sqrt{f}\sqrt{\log(F)}+b\sqrt{f}\sqrt{\log(F)}\log\left(c(d+ex)^n\right)\right)}{2be\sqrt{f}\,gn\sqrt{\log(F)}}
\end{aligned}
$$

Mathematica [A] time = 0.05, size = 59, normalized size = 0.84

$$
\frac{\sqrt{\pi}\,\text{erfi}\left(\sqrt{f}\sqrt{\log(F)}\left(a+b\log\left(c(d+ex)^n\right)\right)\right)}{2be\sqrt{f}\,gn\sqrt{\log(F)}}
$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n])^2)/(d*g + e*g*x),x]
[Out] (Sqrt[Pi]*Erfi[Sqrt[f]*Sqrt[Log[F]]*(a + b*Log[c*(d + e*x)^n])])/(2*b*e*Sqr
t[f]*g*n*Sqrt[Log[F]])
```

fricas [A] time = 0.42, size = 66, normalized size = 0.94

$$-\frac{\sqrt{\pi}\sqrt{-b^2fn^2\log(F)}\,\operatorname{erf}\left(\frac{\sqrt{-b^2fn^2\log(F)}\,(bn\log(ex+d)+b\log(c)+a)}{bn}\right)}{2\,begn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)/(e*g*x+d*g),x, algorithm="fricas")
```

```
[Out] -1/2*sqrt(pi)*sqrt(-b^2*f*n^2*log(F))*erf(sqrt(-b^2*f*n^2*log(F))*(b*n*log(
e*x + d) + b*log(c) + a)/(b*n))/(b*e*g*n)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{\left(b\log\left((ex+d)^n c\right)+a\right)^2 f}}{egx+dg}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)/(e*g*x+d*g),x, algorithm="giac")
```

```
[Out] integrate(F^((b*log((e*x + d)^n*c) + a)^2*f)/(e*g*x + d*g), x)
```

maple [F(-1)] time = 180.00, size = 0, normalized size = 0.00

$$\int \frac{F^{\left(b\ln\left(c(ex+d)^n\right)+a\right)^2 f}}{egx+dg}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^((b*ln(c*(e*x+d)^n)+a)^2*f)/(e*g*x+d*g),x)
```

```
[Out] int(F^((b*ln(c*(e*x+d)^n)+a)^2*f)/(e*g*x+d*g),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{\left(b\log\left((ex+d)^n c\right)+a\right)^2 f}}{egx+dg}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)/(e*g*x+d*g),x, algorithm="maxima")
```

```
[Out] integrate(F^((b*log((e*x + d)^n*c) + a)^2*f)/(e*g*x + d*g), x)
```

mupad [B] time = 3.69, size = 63, normalized size = 0.90

$$-\frac{\sqrt{\pi}\ \mathrm{erf}\left(\frac{1\mathrm{i}\,f\ \ln(F)\ \ln\left(c\,(d+e\,x)^n\right)\,b^2+1\mathrm{i}\,a\,f\ \ln(F)\,b}{\sqrt{b^2\,f\ \ln(F)}}\right)\,1\mathrm{i}}{2\,e\,g\,n\,\sqrt{b^2\,f\ \ln(F)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n))^2)/(d*g + e*g*x),x)
```

```
[Out] -(pi^(1/2)*erf((b^2*f*log(F)*log(c*(d + e*x)^n)*1i + a*b*f*log(F)*1i)/(b^2*
f*log(F))^(1/2))*1i)/(2*e*g*n*(b^2*f*log(F))^(1/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{F^{a^2f}F^{b^2f\log\left(c(d+ex)^n\right)^2}F^{2abf\log\left(c(d+ex)^n\right)}}{d+ex}\,dx}{g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n))**2)/(e*g*x+d*g),x)
```

```
[Out] Integral(F**(a**2*f)*F**(b**2*f*log(c*(d + e*x)**n)**2)*F**(2*a*b*f*log(c*(
d + e*x)**n))/(d + e*x), x)/g
```

3.607 $\int \frac{F^{f\left(a+b\log\left(c(d+ex)^n\right)\right)^2}}{(dg+egx)^2}\,dx$

Optimal. Leaf size=128

$$-\frac{\sqrt{\pi}\,\left(c(d+ex)^n\right)^{\frac{1}{n}}\,e^{\frac{a}{bn}-\frac{1}{4b^2fn^2\log(F)}}\operatorname{erfi}\left(\frac{-2abf\log(F)-2b^2f\log(F)\log\left(c(d+ex)^n\right)+\frac{1}{n}}{2b\sqrt{f}\,\sqrt{\log(F)}}\right)}{2be\sqrt{f}\,g^2n\sqrt{\log(F)}\,(d+ex)}$$

```
[Out] 1/2*exp(a/b/n-1/4/b^2/f/n^2/ln(F))*(c*(e*x+d)^n)^(1/n)*erfi(1/2*(-1/n+2*a*b
*f*ln(F)+2*b^2*f*ln(F)*ln(c*(e*x+d)^n))/b/f^(1/2)/ln(F)^(1/2))*Pi^(1/2)/b/e
/g^2/n/(e*x+d)/f^(1/2)/ln(F)^(1/2)
```

Rubi [A] time = 0.41, antiderivative size = 128, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.226, Rules used = {12, 2278, 2274, 15, 2276, 2234, 2204}

$$-\frac{\sqrt{\pi}\,\left(c(d+ex)^n\right)^{\frac{1}{n}}\,e^{\frac{a}{bn}-\frac{1}{4b^2fn^2\log(F)}}\operatorname{Erfi}\left(\frac{-2abf\log(F)-2b^2f\log(F)\log\left(c(d+ex)^n\right)+\frac{1}{n}}{2b\sqrt{f}\,\sqrt{\log(F)}}\right)}{2be\sqrt{f}\,g^2n\sqrt{\log(F)}\,(d+ex)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n])^2)/(d*g + e*g*x)^2,x]
```

```
[Out] -(E^(a/(b*n) - 1/(4*b^2*f*n^2*Log[F]))*Sqrt[Pi]*(c*(d + e*x)^n)^n^(-1)*Erfi
[(n^(-1) - 2*a*b*f*Log[F] - 2*b^2*f*Log[F]*Log[c*(d + e*x)^n])/(2*b*Sqrt[f]
*Sqrt[Log[F]])])/(2*b*e*Sqrt[f]*g^2*n*(d + e*x)*Sqrt[Log[F]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 15

```
Int[(u_.)*((a_.)*(x_)^(n_))^(m_), x_Symbol] :> Dist[(a^IntPart[m]*(a*x^n)^F
racPart[m])/x^(n*FracPart[m]), Int[u*x^(m*n), x], x] /; FreeQ[{a, m, n}, x]
 && !IntegerQ[m]
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
```

```
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2234

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2274

```
Int[(u_.)*(F_)^((a_.)*(Log[z_]*(b_.) + (v_.))), x_Symbol] :> Int[u*F^(a*v)*
z^(a*b*Log[F]), x] /; FreeQ[{F, a, b}, x]
```

Rule 2276

```
Int[(F_)^(((a_.) + Log[(c_.)*(x_)^(n_.)]^2*(b_.))*(d_.))*((e_.)*(x_))^(m_.)
, x_Symbol] :> Dist[(e*x)^(m + 1)/(e*n*(c*x^n)^((m + 1)/n)), Subst[Int[E^(a
*d*Log[F] + ((m + 1)*x)/n + b*d*Log[F]*x^2), x], x, Log[c*x^n]], x] /; Free
Q[{F, a, b, c, d, e, m, n}, x]
```

Rule 2278

```
Int[(F_)^(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^2*(d_.))*((e_.)*(x_))^(m_.)
, x_Symbol] :> Int[(e*x)^m*F^(a^2*d + 2*a*b*d*Log[c*x^n] + b^2*d*Log[c*x^n]
^2), x] /; FreeQ[{F, a, b, c, d, e, m, n}, x]
```

Rubi steps

$$\int \frac{F^{f\left(a+b\log\left(c(d+ex)^n\right)\right)^2}}{(dg+egx)^2}\,dx = \frac{\text{Subst}\left(\int \frac{F^{f\left(a+b\log\left(cx^n\right)\right)^2}}{g^2x^2}\,dx,x,d+ex\right)}{e}$$
$$= \frac{\text{Subst}\left(\int \frac{F^{f\left(a+b\log\left(cx^n\right)\right)^2}}{x^2}\,dx,x,d+ex\right)}{eg^2}$$
$$= \frac{\text{Subst}\left(\int \frac{F^{a^2f+2abf\log\left(cx^n\right)+b^2f\log^2\left(cx^n\right)}}{x^2}\,dx,x,d+ex\right)}{eg^2}$$
$$= \frac{\text{Subst}\left(\int \frac{F^{a^2f+b^2f\log^2\left(cx^n\right)}\left(cx^n\right)^{2abf\log(F)}}{x^2}\,dx,x,d+ex\right)}{eg^2}$$
$$= \frac{\left((d+ex)^{-2abfn\log(F)}\left(c(d+ex)^n\right)^{2abf\log(F)}\right)\text{Subst}\left(\int F^{a^2f+b^2f\log^2\left(cx^n\right)}x^{-2+2abfn\log(F)}\,dx\right.}{eg^2}$$
$$= \frac{\left(c(d+ex)^n\right)^{2abf\log(F)-\frac{-1+2abfn\log(F)}{n}}\,\text{Subst}\left(\int \exp\left(a^2f\log(F)+b^2fx^2\log(F)+\frac{x(-1+2ab}{n}\right.\right.}{eg^2n(d+ex)}$$
$$= \frac{\left(e^{\frac{a}{bn}-\frac{1}{4b^2fn^2\log(F)}}\left(c(d+ex)^n\right)^{2abf\log(F)-\frac{-1+2abfn\log(F)}{n}}\right)\text{Subst}\left(\int \exp\left(\frac{\left(2b^2fx\log(F)+\frac{-1+2abfn\log}{n}\right.}{4b^2f\log(F)}\right.\right.}{eg^2n(d+ex)}$$
$$= -\frac{e^{\frac{a}{bn}-\frac{1}{4b^2fn^2\log(F)}}\sqrt{\pi}\left(c(d+ex)^n\right)^{\frac{1}{n}}\text{erfi}\left(\frac{\frac{1}{n}-2abf\log(F)-2b^2f\log(F)\log\left(c(d+ex)^n\right)}{2b\sqrt{f}\sqrt{\log(F)}}\right)}{2be\sqrt{f}\,g^2n(d+ex)\sqrt{\log(F)}}$$

Mathematica [A] time = 0.26, size = 126, normalized size = 0.98

$$\frac{\sqrt{\pi}\left(c(d+ex)^n\right)^{\frac{1}{n}}e^{\frac{4abfn\log(F)-1}{4b^2fn^2\log(F)}}\text{erfi}\left(\frac{2bfn\log(F)\left(a+b\log\left(c(d+ex)^n\right)\right)-1}{2b\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2be\sqrt{f}\,g^2n\sqrt{\log(F)}\,(d+ex)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n])^2)/(d*g + e*g*x)^2,x]
```

```
[Out] (E^((-1 + 4*a*b*f*n*Log[F])/(4*b^2*f*n^2*Log[F]))*Sqrt[Pi]*(c*(d + e*x)^n)^
n^(-1)*Erfi[(-1 + 2*b*f*n*Log[F]*(a + b*Log[c*(d + e*x)^n]))/(2*b*Sqrt[f]*n
*Sqrt[Log[F]])])/(2*b*e*Sqrt[f]*g^2*n*(d + e*x)*Sqrt[Log[F]])
```

fricas [A] time = 0.44, size = 134, normalized size = 1.05

$$-\frac{\sqrt{\pi}\sqrt{-b^2fn^2\log(F)}\,\operatorname{erf}\left(\frac{\left(2\,b^2fn^2\log(ex+d)\log(F)+2\,b^2fn\log(F)\log(c)+2\,abfn\log(F)-1\right)\sqrt{-b^2fn^2\log(F)}}{2\,b^2fn^2\log(F)}\right)e^{\left(\frac{4\,b^2fn\log(F)\log(c)+4\,abfn\,\cdots}{4\,b^2fn^2\log(F)}\right.}}{2\,beg^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)/(e*g*x+d*g)^2,x, algorithm="fricas
")
```

```
[Out] -1/2*sqrt(pi)*sqrt(-b^2*f*n^2*log(F))*erf(1/2*(2*b^2*f*n^2*log(e*x + d)*log
(F) + 2*b^2*f*n*log(F)*log(c) + 2*a*b*f*n*log(F) - 1)*sqrt(-b^2*f*n^2*log(F
))/(b^2*f*n^2*log(F)))*e^(1/4*(4*b^2*f*n*log(F)*log(c) + 4*a*b*f*n*log(F) -
 1)/(b^2*f*n^2*log(F)))/(b*e*g^2*n)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{\left(b\log\left((ex+d)^nc\right)+a\right)^2f}}{\left(egx+dg\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)/(e*g*x+d*g)^2,x, algorithm="giac")
```

```
[Out] integrate(F^((b*log((e*x + d)^n*c) + a)^2*f)/(e*g*x + d*g)^2, x)
```

maple [F] time = 0.75, size = 0, normalized size = 0.00

$$\int \frac{F^{\left(b\ln\left(c(ex+d)^n\right)+a\right)^2f}}{\left(egx+dg\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^((b*ln(c*(e*x+d)^n)+a)^2*f)/(e*g*x+d*g)^2,x)
```

```
[Out] int(F^((b*ln(c*(e*x+d)^n)+a)^2*f)/(e*g*x+d*g)^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{\left(b\log\left((ex+d)^nc\right)+a\right)^2f}}{\left(egx+dg\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)/(e*g*x+d*g)^2,x, algorithm="maxima
")
```

```
[Out] integrate(F^((b*log((e*x + d)^n*c) + a)^2*f)/(e*g*x + d*g)^2, x)
```

mupad **[F]** time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{e^{f\,\ln(F)\,\left(a+b\,\ln\left(c\,(d+e\,x)^n\right)\right)^2}}{\left(d\,g+e\,g\,x\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n))^2)/(d*g + e*g*x)^2,x)
```

```
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n))^2)/(d*g + e*g*x)^2, x)
```

sympy **[F(-1)]** time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n))**2)/(e*g*x+d*g)**2,x)
```

```
[Out] Timed out
```

3.608 $\int \frac{F^{f\left(a+b\log\left(c(d+ex)^n\right)\right)^2}}{(dg+egx)^3}\,dx$

Optimal. Leaf size=126

$$-\frac{\sqrt{\pi}\,\left(c(d+ex)^n\right)^{2/n}e^{-\frac{1-2abfn\log(F)}{b^2fn^2\log(F)}}\,\mathrm{erfi}\left(\frac{-abf\log(F)+b^2(-f)\log(F)\log\left(c(d+ex)^n\right)+\frac{1}{n}}{b\sqrt{f}\,\sqrt{\log(F)}}\right)}{2be\sqrt{f}\,g^3n\sqrt{\log(F)}\,(d+ex)^2}$$

```
[Out] 1/2*(c*(e*x+d)^n)^(2/n)*erfi((-1/n+a*b*f*ln(F)+b^2*f*ln(F)*ln(c*(e*x+d)^n))
/b/f^(1/2)/ln(F)^(1/2))*Pi^(1/2)/b/e/exp((1-2*a*b*f*n*ln(F))/b^2/f/n^2/ln(F
))/g^3/n/(e*x+d)^2/f^(1/2)/ln(F)^(1/2)
```

Rubi [A] time = 0.41, antiderivative size = 126, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.226, Rules used = {12, 2278, 2274, 15, 2276, 2234, 2204}

$$-\frac{\sqrt{\pi}\,\left(c(d+ex)^n\right)^{2/n}e^{-\frac{1-2abfn\log(F)}{b^2fn^2\log(F)}}\,\mathrm{Erfi}\left(\frac{-abf\log(F)+b^2(-f)\log(F)\log\left(c(d+ex)^n\right)+\frac{1}{n}}{b\sqrt{f}\,\sqrt{\log(F)}}\right)}{2be\sqrt{f}\,g^3n\sqrt{\log(F)}\,(d+ex)^2}$$

Antiderivative was successfully verified.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n])^2)/(d*g + e*g*x)^3,x]
```

```
[Out] -(Sqrt[Pi]*(c*(d + e*x)^n)^(2/n)*Erfi[(n^(-1) - a*b*f*Log[F] - b^2*f*Log[F]
*Log[c*(d + e*x)^n])/(b*Sqrt[f]*Sqrt[Log[F]])])/(2*b*e*E^((1 - 2*a*b*f*n*Lo
g[F])/(b^2*f*n^2*Log[F]))*Sqrt[f]*g^3*n*(d + e*x)^2*Sqrt[Log[F]])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 15

```
Int[(u_.)*((a_.)*(x_)^(n_))^(m_), x_Symbol] :> Dist[(a^IntPart[m]*(a*x^n)^F
racPart[m])/x^(n*FracPart[m]), Int[u*x^(m*n), x], x] /; FreeQ[{a, m, n}, x]
 &&  !IntegerQ[m]
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
```

```
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2234

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2274

```
Int[(u_.)*(F_)^((a_.)*(Log[z_]*(b_.) + (v_.))), x_Symbol] :> Int[u*F^(a*v)*
z^(a*b*Log[F]), x] /; FreeQ[{F, a, b}, x]
```

Rule 2276

```
Int[(F_)^(((a_.) + Log[(c_.)*(x_)^(n_.)]^2*(b_.))*(d_.))*((e_.)*(x_))^(m_.)
, x_Symbol] :> Dist[(e*x)^(m + 1)/(e*n*(c*x^n)^((m + 1)/n)), Subst[Int[E^(a
*d*Log[F] + ((m + 1)*x)/n + b*d*Log[F]*x^2), x], x, Log[c*x^n]], x] /; Free
Q[{F, a, b, c, d, e, m, n}, x]
```

Rule 2278

```
Int[(F_)^(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^2*(d_.))*((e_.)*(x_))^(m_.)
, x_Symbol] :> Int[(e*x)^m*F^(a^2*d + 2*a*b*d*Log[c*x^n] + b^2*d*Log[c*x^n]
^2), x] /; FreeQ[{F, a, b, c, d, e, m, n}, x]
```

Rubi steps

$$\int \frac{F^{f\left(a+b\log\left(c(d+ex)^n\right)\right)^2}}{(dg+egx)^3}\,dx = \frac{\text{Subst}\left(\int \frac{F^{f\left(a+b\log\left(cx^n\right)\right)^2}}{g^3x^3}\,dx,x,d+ex\right)}{e}$$

$$= \frac{\text{Subst}\left(\int \frac{F^{f\left(a+b\log\left(cx^n\right)\right)^2}}{x^3}\,dx,x,d+ex\right)}{eg^3}$$

$$= \frac{\text{Subst}\left(\int \frac{F^{a^2f+2abf\log\left(cx^n\right)+b^2f\log^2\left(cx^n\right)}}{x^3}\,dx,x,d+ex\right)}{eg^3}$$

$$= \frac{\text{Subst}\left(\int \frac{F^{a^2f+b^2f\log^2\left(cx^n\right)}\left(cx^n\right)^{2abf\log(F)}}{x^3}\,dx,x,d+ex\right)}{eg^3}$$

$$= \frac{\left((d+ex)^{-2abfn\log(F)}\left(c(d+ex)^n\right)^{2abf\log(F)}\right)\text{Subst}\left(\int F^{a^2f+b^2f\log^2\left(cx^n\right)}x^{-3+2abfn\log(F)}\,d\cdots\right.}{eg^3}$$

$$= \frac{\left(c(d+ex)^n\right)^{2abf\log(F)-\frac{-2+2abfn\log(F)}{n}}\text{Subst}\left(\int \exp\left(a^2f\log(F)+b^2fx^2\log(F)+\frac{x(-2+2\cdots}{\cdots}\right.\right.}{eg^3n(d+ex)^2}$$

$$= \frac{\left(\exp\left(a^2f\log(F)-\frac{(-2+2abfn\log(F))^2}{4b^2fn^2\log(F)}\right)\left(c(d+ex)^n\right)^{2abf\log(F)-\frac{-2+2abfn\log(F)}{n}}\right)\text{Subst}\left(\int \exp\cdots\right.}{eg^3n(d+ex)^2}$$

$$= -\frac{e^{-\frac{1-2abfn\log(F)}{b^2fn^2\log(F)}}\sqrt{\pi}\left(c(d+ex)^n\right)^{2/n}\text{erfi}\left(\frac{\frac{1}{n}-abf\log(F)-b^2f\log(F)\log\left(c(d+ex)^n\right)}{b\sqrt{f}\sqrt{\log(F)}}\right)}{2be\sqrt{f}\,g^3n(d+ex)^2\sqrt{\log(F)}}$$

Mathematica [A] time = 0.32, size = 121, normalized size = 0.96

$$\frac{\sqrt{\pi}\left(c(d+ex)^n\right)^{2/n}e^{\frac{2abfn\log(F)-1}{b^2fn^2\log(F)}}\text{erfi}\left(\frac{bfn\log(F)\left(a+b\log\left(c(d+ex)^n\right)\right)-1}{b\sqrt{f}\,n\sqrt{\log(F)}}\right)}{2be\sqrt{f}\,g^3n\sqrt{\log(F)}\,(d+ex)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n])^2)/(d*g + e*g*x)^3,x]
```

```
[Out] (E^((-1 + 2*a*b*f*n*Log[F])/(b^2*f*n^2*Log[F]))*Sqrt[Pi]*(c*(d + e*x)^n)^(2
/n)*Erfi[(-1 + b*f*n*Log[F]*(a + b*Log[c*(d + e*x)^n]))/(b*Sqrt[f]*n*Sqrt[L
og[F]])])/(2*b*e*Sqrt[f]*g^3*n*(d + e*x)^2*Sqrt[Log[F]])
```

fricas [A] time = 0.43, size = 129, normalized size = 1.02

$$-\frac{\sqrt{\pi}\sqrt{-b^{2}fn^{2}\log(F)}\operatorname{erf}\left(\frac{\left(b^{2}fn^{2}\log(ex+d)\log(F)+b^{2}fn\log(F)\log(c)+abfn\log(F)-1\right)\sqrt{-b^{2}fn^{2}\log(F)}}{b^{2}fn^{2}\log(F)}\right)e^{\left(\frac{2\,b^{2}fn\log(F)\log(c)+2\,abfn\log(F)-1}{b^{2}fn^{2}\log(F)}\right)}}{2\,beg^{3}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)/(e*g*x+d*g)^3,x, algorithm="fricas
")
```

```
[Out] -1/2*sqrt(pi)*sqrt(-b^2*f*n^2*log(F))*erf((b^2*f*n^2*log(e*x + d)*log(F) +
b^2*f*n*log(F)*log(c) + a*b*f*n*log(F) - 1)*sqrt(-b^2*f*n^2*log(F))/(b^2*f*
n^2*log(F)))*e^((2*b^2*f*n*log(F)*log(c) + 2*a*b*f*n*log(F) - 1)/(b^2*f*n^2
*log(F)))/(b*e*g^3*n)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{\left(b\log\left((ex+d)^{n}c\right)+a\right)^{2}f}}{\left(egx+dg\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)/(e*g*x+d*g)^3,x, algorithm="giac")
```

```
[Out] integrate(F^((b*log((e*x + d)^n*c) + a)^2*f)/(e*g*x + d*g)^3, x)
```

maple [F] time = 0.99, size = 0, normalized size = 0.00

$$\int \frac{F^{\left(b\ln\left(c(ex+d)^{n}\right)+a\right)^{2}f}}{\left(egx+dg\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^((b*ln(c*(e*x+d)^n)+a)^2*f)/(e*g*x+d*g)^3,x)
```

```
[Out] int(F^((b*ln(c*(e*x+d)^n)+a)^2*f)/(e*g*x+d*g)^3,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{\left(b\log\left((ex+d)^{n}c\right)+a\right)^{2}f}}{\left(egx+dg\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)/(e*g*x+d*g)^3,x, algorithm="maxima
")
```

```
[Out] integrate(F^((b*log((e*x + d)^n*c) + a)^2*f)/(e*g*x + d*g)^3, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{e}^{f\,\ln(F)\,\left(a+b\,\ln\left(c\,(d+e\,x)^n\right)\right)^2}}{\left(d\,g+e\,g\,x\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n))^2)/(d*g + e*g*x)^3,x)
```

```
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n))^2)/(d*g + e*g*x)^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n))**2)/(e*g*x+d*g)**3,x)
```

```
[Out] Timed out
```

3.609 $\int F^{f\left(a+b\log\left(c(d+ex)^n\right)\right)^2}(g+hx)^m\,dx$

Optimal. Leaf size=31

$$\text{Int}\left((g+hx)^m F^{f\left(a+b\log\left(c(d+ex)^n\right)\right)^2},x\right)$$

```
[Out] Unintegrable(F^(f*(a+b*ln(c*(e*x+d)^n))^2)*(h*x+g)^m,x)
```

Rubi [A] time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int F^{f\left(a+b\log\left(c(d+ex)^n\right)\right)^2}(g+hx)^m\,dx$$

Verification is Not applicable to the result.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n])^2)*(g + h*x)^m,x]
[Out] Defer[Int][F^(f*(a + b*Log[c*(d + e*x)^n])^2)*(g + h*x)^m, x]
```

Rubi steps

$$\int F^{f\left(a+b\log\left(c(d+ex)^n\right)\right)^2}(g+hx)^m\,dx=\int F^{f\left(a+b\log\left(c(d+ex)^n\right)\right)^2}(g+hx)^m\,dx$$

Mathematica [A] time = 1.42, size = 0, normalized size = 0.00

$$\int F^{f\left(a+b\log\left(c(d+ex)^n\right)\right)^2}(g+hx)^m\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n])^2)*(g + h*x)^m,x]
[Out] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n])^2)*(g + h*x)^m, x]
```

fricas [A] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(hx+g\right)^m F^{b^2 f\log\left((ex+d)^n c\right)^2+2\,abf\log\left((ex+d)^n c\right)+a^2 f},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)*(h*x+g)^m,x, algorithm="fricas")
```

```
[Out] integral((h*x + g)^m*F^(b^2*f*log((e*x + d)^n*c)^2 + 2*a*b*f*log((e*x + d)^
n*c) + a^2*f), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(hx+g\right)^{m}F^{\left(b\log\left(\left(ex+d\right)^{n}c\right)+a\right)^{2}f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)*(h*x+g)^m,x, algorithm="giac")
[Out] integrate((h*x + g)^m*F^((b*log((e*x + d)^n*c) + a)^2*f), x)
```

maple [A] time = 1.02, size = 0, normalized size = 0.00

$$\int F^{\left(b\ln\left(c\left(ex+d\right)^{n}\right)+a\right)^{2}f}\left(hx+g\right)^{m}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^((b*ln(c*(e*x+d)^n)+a)^2*f)*(h*x+g)^m,x)
[Out] int(F^((b*ln(c*(e*x+d)^n)+a)^2*f)*(h*x+g)^m,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(hx+g\right)^{m}F^{\left(b\log\left(\left(ex+d\right)^{n}c\right)+a\right)^{2}f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)*(h*x+g)^m,x, algorithm="maxima")
[Out] integrate((h*x + g)^m*F^((b*log((e*x + d)^n*c) + a)^2*f), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \mathrm{e}^{f\,\ln(F)\,\left(a+b\,\ln\left(c\,(d+e\,x)^{n}\right)\right)^{2}}\,\left(g+h\,x\right)^{m}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n))^2)*(g + h*x)^m,x)
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n))^2)*(g + h*x)^m, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n))**2)*(h*x+g)**m,x)
```

```
[Out] Timed out
```

3.610 $\int F^{f\left(a+b\log(c(d+ex)^n)\right)^2}(g+hx)^3\,dx$

Optimal. Leaf size=535

$$\frac{3\sqrt{\pi}\,h^2(d+ex)^3(eg-dh)\left(c(d+ex)^n\right)^{-3/n}\exp\left(-\frac{3(4abfn\log(F)+3)}{4b^2fn^2\log(F)}\right)\mathrm{erfi}\left(\frac{2abf\log(F)+2b^2f\log(F)\log(c(d+ex)^n)+\frac{3}{n}}{2b\sqrt{f}\sqrt{\log(F)}}\right)}{2be^4\sqrt{f}\,n\sqrt{\log(F)}}+\frac{3\sqrt{\pi}\,h}{}$$

```
[Out] 3/2*h*(-d*h+e*g)^2*(e*x+d)^2*erfi((1/n+a*b*f*ln(F)+b^2*f*ln(F)*ln(c*(e*x+d)
^n))/b/f^(1/2)/ln(F)^(1/2))*Pi^(1/2)/b/e^4/exp((1+2*a*b*f*n*ln(F))/b^2/f/n^
2/ln(F))/n/((c*(e*x+d)^n)^(2/n))/f^(1/2)/ln(F)^(1/2)+1/2*h^3*(e*x+d)^4*erfi
((2/n+a*b*f*ln(F)+b^2*f*ln(F)*ln(c*(e*x+d)^n))/b/f^(1/2)/ln(F)^(1/2))*Pi^(1
/2)/b/e^4/exp(4*(1+a*b*f*n*ln(F))/b^2/f/n^2/ln(F))/n/((c*(e*x+d)^n)^(4/n))/
f^(1/2)/ln(F)^(1/2)+1/2*(-d*h+e*g)^3*(e*x+d)*erfi(1/2*(1/n+2*a*b*f*ln(F)+2*
b^2*f*ln(F)*ln(c*(e*x+d)^n))/b/f^(1/2)/ln(F)^(1/2))*Pi^(1/2)/b/e^4/exp(1/4*
(1+4*a*b*f*n*ln(F))/b^2/f/n^2/ln(F))/n/((c*(e*x+d)^n)^(1/n))/f^(1/2)/ln(F)^
(1/2)+3/2*h^2*(-d*h+e*g)*(e*x+d)^3*erfi(1/2*(3/n+2*a*b*f*ln(F)+2*b^2*f*ln(F
)*ln(c*(e*x+d)^n))/b/f^(1/2)/ln(F)^(1/2))*Pi^(1/2)/b/e^4/exp(3/4*(3+4*a*b*f
*n*ln(F))/b^2/f/n^2/ln(F))/n/((c*(e*x+d)^n)^(3/n))/f^(1/2)/ln(F)^(1/2)
```

Rubi [F] time = 0.49, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int F^{f\left(a+b\log(c(d+ex)^n)\right)^2}(g+hx)^3\,dx$$

Verification is Not applicable to the result.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n])^2)*(g + h*x)^3,x]
```

```
[Out] (g^3*Sqrt[Pi]*(d + e*x)*Erfi[(n^(-1) + 2*a*b*f*Log[F] + 2*b^2*f*Log[F]*Log[
c*(d + e*x)^n])/(2*b*Sqrt[f]*Sqrt[Log[F]])])/(2*b*e*E^((1 + 4*a*b*f*n*Log[F
])/(4*b^2*f*n^2*Log[F]))*Sqrt[f]*n*(c*(d + e*x)^n)^n^(-1)*Sqrt[Log[F]]) + 3
*g^2*h*Defer[Int][F^(f*(a + b*Log[c*(d + e*x)^n])^2)*x, x] + 3*g*h^2*Defer[
Int][F^(f*(a + b*Log[c*(d + e*x)^n])^2)*x^2, x] + h^3*Defer[Int][F^(f*(a +
b*Log[c*(d + e*x)^n])^2)*x^3, x]
```

Rubi steps

$$\int F^{f\left(a+b\log(c(d+ex)^n)\right)^2}(g+hx)^3\,dx=\int\left(F^{f\left(a+b\log(c(d+ex)^n)\right)^2}g^3+3F^{f\left(a+b\log(c(d+ex)^n)\right)^2}g^2hx+3F^{f\left(a+b\log(c(d+ex)^n)\right)^2}gh\right.$$

$$=g^3\int F^{f\left(a+b\log(c(d+ex)^n)\right)^2}dx+\left(3g^2h\right)\int F^{f\left(a+b\log(c(d+ex)^n)\right)^2}x\,dx+\left(3gh^2\right)\int F$$

$$=\frac{g^3\,\text{Subst}\left(\int F^{f\left(a+b\log(cx^n)\right)^2}dx,x,d+ex\right)}{e}+\left(3g^2h\right)\int F^{f\left(a+b\log(c(d+ex)^n)\right)^2}x\,dx$$

$$=\frac{g^3\,\text{Subst}\left(\int F^{a^2f+2abf\log(cx^n)+b^2f\log^2(cx^n)}dx,x,d+ex\right)}{e}+\left(3g^2h\right)\int F^{f\left(a+b\log(c\right.}$$

$$=\frac{g^3\,\text{Subst}\left(\int F^{a^2f+b^2f\log^2(cx^n)}\left(cx^n\right)^{2abf\log(F)}dx,x,d+ex\right)}{e}+\left(3g^2h\right)\int F^{f\left(a+b\right.}$$

$$=\left(3g^2h\right)\int F^{f\left(a+b\log(c(d+ex)^n)\right)^2}x\,dx+\left(3gh^2\right)\int F^{f\left(a+b\log(c(d+ex)^n)\right)^2}x^2\,dx+h^3\int$$

$$=\left(3g^2h\right)\int F^{f\left(a+b\log(c(d+ex)^n)\right)^2}x\,dx+\left(3gh^2\right)\int F^{f\left(a+b\log(c(d+ex)^n)\right)^2}x^2\,dx+h^3\int$$

$$=\left(3g^2h\right)\int F^{f\left(a+b\log(c(d+ex)^n)\right)^2}x\,dx+\left(3gh^2\right)\int F^{f\left(a+b\log(c(d+ex)^n)\right)^2}x^2\,dx+h^3\int$$

$$=\frac{e^{-\frac{1+4abfn\log(F)}{4b^2fn^2\log(F)}}g^3\sqrt{\pi}\,(d+ex)\left(c(d+ex)^n\right)^{-1/n}\text{erfi}\left(\frac{\frac{1}{n}+2abf\log(F)+2b^2f\log(F)\log(c(d+}{2b\sqrt{f}\sqrt{\log(F)}}\right.}{2be\sqrt{f}\,n\sqrt{\log(F)}}$$

Mathematica [A] time = 2.42, size = 434, normalized size = 0.81

$$\frac{\sqrt{\pi}\,(d+ex)\left(c(d+ex)^n\right)^{-4/n}e^{-\frac{4(abfn\log(F)+1)}{b^2fn^2\log(F)}}\left((eg-dh)\left(c(d+ex)^n\right)^{\frac{1}{n}}e^{\frac{4abfn\log(F)+7}{4b^2fn^2\log(F)}}\left((eg-dh)^2\left(c(d+ex)^n\right)^{2/n}e^{\frac{2abfn\log(F}{b^2fn^2\log(}}\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n])^2)*(g + h*x)^3,x]
```

```
[Out] (Sqrt[Pi]*(d + e*x)*(3*E^((3 + 2*a*b*f*n*Log[F])/(b^2*f*n^2*Log[F]))*h*(e*g
 - d*h)^2*(d + e*x)*(c*(d + e*x)^n)^(2/n)*Erfi[(1 + b*f*n*Log[F]*(a + b*Log
[c*(d + e*x)^n]))/(b*Sqrt[f]*n*Sqrt[Log[F]])] + h^3*(d + e*x)^3*Erfi[(2 + b
```

```
*f*n*Log[F]*(a + b*Log[c*(d + e*x)^n]))/(b*Sqrt[f]*n*Sqrt[Log[F]])] + E^((7
 + 4*a*b*f*n*Log[F])/(4*b^2*f*n^2*Log[F]))*(e*g - d*h)*(c*(d + e*x)^n)^n^(-
1)*(E^((2 + 2*a*b*f*n*Log[F])/(b^2*f*n^2*Log[F]))*(e*g - d*h)^2*(c*(d + e*x
)^n)^(2/n)*Erfi[(1 + 2*b*f*n*Log[F]*(a + b*Log[c*(d + e*x)^n]))/(2*b*Sqrt[f
]*n*Sqrt[Log[F]])] + 3*h^2*(d + e*x)^2*Erfi[(3 + 2*b*f*n*Log[F]*(a + b*Log[
c*(d + e*x)^n]))/(2*b*Sqrt[f]*n*Sqrt[Log[F]])])))/(2*b*e^4*E^((4*(1 + a*b*f
*n*Log[F]))/(b^2*f*n^2*Log[F]))*Sqrt[f]*n*(c*(d + e*x)^n)^(4/n)*Sqrt[Log[F]
])
```

fricas [A] time = 0.42, size = 564, normalized size = 1.05

$$-\frac{\sqrt{\pi}\sqrt{-b^2fn^2\log(F)}\,h^3\operatorname{erf}\left(\frac{\left(b^2fn^2\log(ex+d)\log(F)+b^2fn\log(F)\log(c)+abfn\log(F)+2\right)\sqrt{-b^2fn^2\log(F)}}{b^2fn^2\log(F)}\right)e^{\left(-\frac{4\left(b^2fn\log(F)\log(c)+abfn\log\cdots\right.}{b^2fn^2\log(F)}\cdots\right.}\cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)*(h*x+g)^3,x, algorithm="fricas")
```

```
[Out] -1/2*(sqrt(pi)*sqrt(-b^2*f*n^2*log(F))*h^3*erf((b^2*f*n^2*log(e*x + d)*log(
F) + b^2*f*n*log(F)*log(c) + a*b*f*n*log(F) + 2)*sqrt(-b^2*f*n^2*log(F))/(b
^2*f*n^2*log(F)))*e^(-4*(b^2*f*n*log(F)*log(c) + a*b*f*n*log(F) + 1)/(b^2*f
*n^2*log(F))) + 3*sqrt(pi)*sqrt(-b^2*f*n^2*log(F))*(e*g*h^2 - d*h^3)*erf(1/
2*(2*b^2*f*n^2*log(e*x + d)*log(F) + 2*b^2*f*n*log(F)*log(c) + 2*a*b*f*n*lo
g(F) + 3)*sqrt(-b^2*f*n^2*log(F))/(b^2*f*n^2*log(F)))*e^(-3/4*(4*b^2*f*n*lo
g(F)*log(c) + 4*a*b*f*n*log(F) + 3)/(b^2*f*n^2*log(F))) + sqrt(pi)*(e^3*g^3
 - 3*d*e^2*g^2*h + 3*d^2*e*g*h^2 - d^3*h^3)*sqrt(-b^2*f*n^2*log(F))*erf(1/2
*(2*b^2*f*n^2*log(e*x + d)*log(F) + 2*b^2*f*n*log(F)*log(c) + 2*a*b*f*n*log
(F) + 1)*sqrt(-b^2*f*n^2*log(F))/(b^2*f*n^2*log(F)))*e^(-1/4*(4*b^2*f*n*log
(F)*log(c) + 4*a*b*f*n*log(F) + 1)/(b^2*f*n^2*log(F))) + 3*sqrt(pi)*sqrt(-b
^2*f*n^2*log(F))*(e^2*g^2*h - 2*d*e*g*h^2 + d^2*h^3)*erf((b^2*f*n^2*log(e*x
 + d)*log(F) + b^2*f*n*log(F)*log(c) + a*b*f*n*log(F) + 1)*sqrt(-b^2*f*n^2*
log(F))/(b^2*f*n^2*log(F)))*e^(-(2*b^2*f*n*log(F)*log(c) + 2*a*b*f*n*log(F)
 + 1)/(b^2*f*n^2*log(F))))/(b*e^4*n)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(hx+g\right)^3 F^{\left(b\log\left(\left(ex+d\right)^n c\right)+a\right)^2 f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)*(h*x+g)^3,x, algorithm="giac")
```

```
[Out] integrate((h*x + g)^3*F^((b*log((e*x + d)^n*c) + a)^2*f), x)
```

maple [F] time = 0.78, size = 0, normalized size = 0.00

$$\int \left(hx+g\right)^{3} F^{\left(b\ln\left(c(ex+d)^{n}\right)+a\right)^{2} f}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^((b*ln(c*(e*x+d)^n)+a)^2*f)*(h*x+g)^3,x)
[Out] int(F^((b*ln(c*(e*x+d)^n)+a)^2*f)*(h*x+g)^3,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(hx+g\right)^{3} F^{\left(b\log\left((ex+d)^{n} c\right)+a\right)^{2} f}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)*(h*x+g)^3,x, algorithm="maxima")
[Out] integrate((h*x + g)^3*F^((b*log((e*x + d)^n*c) + a)^2*f), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \mathrm{e}^{f\,\ln(F)\,\left(a+b\,\ln\left(c\,(d+e\,x)^{n}\right)\right)^{2}}\,\left(g+h\,x\right)^{3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n))^2)*(g + h*x)^3,x)
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n))^2)*(g + h*x)^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n))**2)*(h*x+g)**3,x)
[Out] Timed out
```

3.611 $\int F^{f\left(a+b\log(c(d+ex)^n)\right)^2}(g+hx)^2\,dx$

Optimal. Leaf size=397

$$\frac{\sqrt{\pi}\,h^2(d+ex)^3\left(c(d+ex)^n\right)^{-3/n}\exp\left(-\frac{3(4abfn\log(F)+3)}{4b^2fn^2\log(F)}\right)\operatorname{erfi}\left(\frac{2abf\log(F)+2b^2f\log(F)\log(c(d+ex)^n)+\frac{3}{n}}{2b\sqrt{f}\sqrt{\log(F)}}\right)}{2be^3\sqrt{f}\,n\sqrt{\log(F)}}+\frac{\sqrt{\pi}\,h(d+ex)^2(e$$

```
[Out] h*(-d*h+e*g)*(e*x+d)^2*erfi((1/n+a*b*f*ln(F)+b^2*f*ln(F)*ln(c*(e*x+d)^n))/b
/f^(1/2)/ln(F)^(1/2))*Pi^(1/2)/b/e^3/exp((1+2*a*b*f*n*ln(F))/b^2/f/n^2/ln(F
))/n/((c*(e*x+d)^n)^(2/n))/f^(1/2)/ln(F)^(1/2)+1/2*(-d*h+e*g)^2*(e*x+d)*erf
i(1/2*(1/n+2*a*b*f*ln(F)+2*b^2*f*ln(F)*ln(c*(e*x+d)^n))/b/f^(1/2)/ln(F)^(1/
2))*Pi^(1/2)/b/e^3/exp(1/4*(1+4*a*b*f*n*ln(F))/b^2/f/n^2/ln(F))/n/((c*(e*x+
d)^n)^(1/n))/f^(1/2)/ln(F)^(1/2)+1/2*h^2*(e*x+d)^3*erfi(1/2*(3/n+2*a*b*f*ln
(F)+2*b^2*f*ln(F)*ln(c*(e*x+d)^n))/b/f^(1/2)/ln(F)^(1/2))*Pi^(1/2)/b/e^3/ex
p(3/4*(3+4*a*b*f*n*ln(F))/b^2/f/n^2/ln(F))/n/((c*(e*x+d)^n)^(3/n))/f^(1/2)/
ln(F)^(1/2)
```

Rubi [F] time = 0.37, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int F^{f\left(a+b\log(c(d+ex)^n)\right)^2}(g+hx)^2\,dx$$

Verification is Not applicable to the result.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n])^2)*(g + h*x)^2,x]
```

```
[Out] (g^2*Sqrt[Pi]*(d + e*x)*Erfi[(n^(-1) + 2*a*b*f*Log[F] + 2*b^2*f*Log[F]*Log[
c*(d + e*x)^n])/(2*b*Sqrt[f]*Sqrt[Log[F]])])/(2*b*e*E^((1 + 4*a*b*f*n*Log[F
])/(4*b^2*f*n^2*Log[F]))*Sqrt[f]*n*(c*(d + e*x)^n)^n^(-1)*Sqrt[Log[F]]) + 2
*g*h*Defer[Int][F^(f*(a + b*Log[c*(d + e*x)^n])^2)*x, x] + h^2*Defer[Int][F
^(f*(a + b*Log[c*(d + e*x)^n])^2)*x^2, x]
```

Rubi steps

$$\int F^{f\left(a+b\log(c(d+ex)^n)\right)^2}(g+hx)^2\,dx=\int\left(F^{f\left(a+b\log(c(d+ex)^n)\right)^2}g^2+2F^{f\left(a+b\log(c(d+ex)^n)\right)^2}ghx+F^{f\left(a+b\log(c(d+ex)^n)\right)^2}h^2x^2\right.$$

$$=g^2\int F^{f\left(a+b\log(c(d+ex)^n)\right)^2}dx+(2gh)\int F^{f\left(a+b\log(c(d+ex)^n)\right)^2}x\,dx+h^2\int F^{f\left(a+b\log\right.}$$

$$=\frac{g^2\,\mathrm{Subst}\left(\int F^{f\left(a+b\log(cx^n)\right)^2}dx,x,d+ex\right)}{e}+(2gh)\int F^{f\left(a+b\log(c(d+ex)^n)\right)^2}x\,dx+$$

$$=\frac{g^2\,\mathrm{Subst}\left(\int F^{a^2f+2abf\log(cx^n)+b^2f\log^2(cx^n)}dx,x,d+ex\right)}{e}+(2gh)\int F^{f\left(a+b\log(c(d\right.}$$

$$=\frac{g^2\,\mathrm{Subst}\left(\int F^{a^2f+b^2f\log^2(cx^n)}(cx^n)^{2abf\log(F)}dx,x,d+ex\right)}{e}+(2gh)\int F^{f\left(a+b\log\right.}$$

$$=(2gh)\int F^{f\left(a+b\log(c(d+ex)^n)\right)^2}x\,dx+h^2\int F^{f\left(a+b\log(c(d+ex)^n)\right)^2}x^2\,dx+\frac{\left(g^2(d+ex\right.}{}$$

$$=(2gh)\int F^{f\left(a+b\log(c(d+ex)^n)\right)^2}x\,dx+h^2\int F^{f\left(a+b\log(c(d+ex)^n)\right)^2}x^2\,dx+\frac{\left(g^2(d+ex\right.}{}$$

$$=(2gh)\int F^{f\left(a+b\log(c(d+ex)^n)\right)^2}x\,dx+h^2\int F^{f\left(a+b\log(c(d+ex)^n)\right)^2}x^2\,dx+\frac{\left(\exp\left(a^2f\right.\right.}{}$$

$$=\frac{e^{-\frac{1+4abfn\log(F)}{4b^2fn^2\log(F)}}g^2\sqrt{\pi}\,(d+ex)\left(c(d+ex)^n\right)^{-1/n}\mathrm{erfi}\left(\frac{\frac{1}{n}+2abf\log(F)+2b^2f\log(F)\log(c(d+\right.}{2b\sqrt{f}\sqrt{\log(F)}}}{2be\sqrt{f}\,n\sqrt{\log(F)}}$$

Mathematica [A] time = 1.14, size = 331, normalized size = 0.83

$$\frac{\sqrt{\pi}\,(d+ex)\left(c(d+ex)^n\right)^{-3/n}\exp\left(-\frac{3(4abfn\log(F)+3)}{4b^2fn^2\log(F)}\right)\left((eg-dh)^2\left(c(d+ex)^n\right)^{2/n}e^{\frac{2abfn\log(F)+2}{b^2fn^2\log(F)}}\mathrm{erfi}\left(\frac{2bfn\log(F)\left(a+b\log(c(d\right.}{2b\sqrt{f}\,n\sqrt{\log(F)}}\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n])^2)*(g + h*x)^2,x]
```

```
[Out] (Sqrt[Pi]*(d + e*x)*(-2*E^((5 + 4*a*b*f*n*Log[F])/(4*b^2*f*n^2*Log[F]))*h*(
-(e*g) + d*h)*(d + e*x)*(c*(d + e*x)^n)^n^(-1)*Erfi[(1 + b*f*n*Log[F]*(a +
b*Log[c*(d + e*x)^n]))/(b*Sqrt[f]*n*Sqrt[Log[F]])] + E^((2 + 2*a*b*f*n*Log[
```

```
F])/(b^2*f*n^2*Log[F]))*(e*g - d*h)^2*(c*(d + e*x)^n)^(2/n)*Erfi[(1 + 2*b*f
*n*Log[F]*(a + b*Log[c*(d + e*x)^n]))/(2*b*Sqrt[f]*n*Sqrt[Log[F]])] + h^2*(
d + e*x)^2*Erfi[(3 + 2*b*f*n*Log[F]*(a + b*Log[c*(d + e*x)^n]))/(2*b*Sqrt[f
]*n*Sqrt[Log[F]])]))/(2*b*e^3*E^((3*(3 + 4*a*b*f*n*Log[F]))/(4*b^2*f*n^2*Lo
g[F]))*Sqrt[f]*n*(c*(d + e*x)^n)^(3/n)*Sqrt[Log[F]])
```

fricas [A] time = 0.41, size = 407, normalized size = 1.03

$$-\frac{\sqrt{\pi}\sqrt{-b^2fn^2\log(F)}h^2\operatorname{erf}\left(\frac{\left(2b^2fn^2\log(ex+d)\log(F)+2b^2fn\log(F)\log(c)+2abfn\log(F)+3\right)\sqrt{-b^2fn^2\log(F)}}{2b^2fn^2\log(F)}\right)e^{\left(-\frac{3\left(4b^2fn\log(F)\log(c)\cdots}{4b^2fn^2\log\cdots}\right.}}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)*(h*x+g)^2,x, algorithm="fricas")
```

```
[Out] -1/2*(sqrt(pi)*sqrt(-b^2*f*n^2*log(F))*h^2*erf(1/2*(2*b^2*f*n^2*log(e*x + d
)*log(F) + 2*b^2*f*n*log(F)*log(c) + 2*a*b*f*n*log(F) + 3)*sqrt(-b^2*f*n^2*
log(F))/(b^2*f*n^2*log(F)))*e^(-3/4*(4*b^2*f*n*log(F)*log(c) + 4*a*b*f*n*lo
g(F) + 3)/(b^2*f*n^2*log(F))) + sqrt(pi)*sqrt(-b^2*f*n^2*log(F))*(e^2*g^2 -
 2*d*e*g*h + d^2*h^2)*erf(1/2*(2*b^2*f*n^2*log(e*x + d)*log(F) + 2*b^2*f*n*
log(F)*log(c) + 2*a*b*f*n*log(F) + 1)*sqrt(-b^2*f*n^2*log(F))/(b^2*f*n^2*lo
g(F)))*e^(-1/4*(4*b^2*f*n*log(F)*log(c) + 4*a*b*f*n*log(F) + 1)/(b^2*f*n^2*
log(F))) + 2*sqrt(pi)*sqrt(-b^2*f*n^2*log(F))*(e*g*h - d*h^2)*erf((b^2*f*n^
2*log(e*x + d)*log(F) + b^2*f*n*log(F)*log(c) + a*b*f*n*log(F) + 1)*sqrt(-b
^2*f*n^2*log(F))/(b^2*f*n^2*log(F)))*e^(-(2*b^2*f*n*log(F)*log(c) + 2*a*b*f
*n*log(F) + 1)/(b^2*f*n^2*log(F))))/(b*e^3*n)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\left(hx+g\right)^2F^{\left(b\log\left(\left(ex+d\right)^nc\right)+a\right)^2f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)*(h*x+g)^2,x, algorithm="giac")
```

```
[Out] integrate((h*x + g)^2*F^((b*log((e*x + d)^n*c) + a)^2*f), x)
```

maple [F] time = 0.78, size = 0, normalized size = 0.00

$$\int\left(hx+g\right)^2F^{\left(b\ln\left(c\left(ex+d\right)^n\right)+a\right)^2f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^((b*ln(c*(e*x+d)^n)+a)^2*f)*(h*x+g)^2,x)
```

```
[Out] int(F^((b*ln(c*(e*x+d)^n)+a)^2*f)*(h*x+g)^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (hx+g)^2 F^{\left(b\log\left((ex+d)^n c\right)+a\right)^2 f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)*(h*x+g)^2,x, algorithm="maxima")
[Out] integrate((h*x + g)^2*F^((b*log((e*x + d)^n*c) + a)^2*f), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int e^{f\,\ln(F)\,\left(a+b\,\ln\left(c\,(d+e\,x)^n\right)\right)^2}\,\left(g+h\,x\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n))^2)*(g + h*x)^2,x)
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n))^2)*(g + h*x)^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n))**2)*(h*x+g)**2,x)
[Out] Timed out
```

3.612 $\int F^{f\left(a+b\log(c(d+ex)^n)\right)^2}(g+hx)\,dx$

Optimal. Leaf size=257

$$\frac{\sqrt{\pi}\,(d+ex)(eg-dh)\,(c(d+ex)^n)^{-1/n}\,e^{-\frac{4abfn\log(F)+1}{4b^2fn^2\log(F)}}\operatorname{erfi}\left(\frac{2abf\log(F)+2b^2f\log(F)\log(c(d+ex)^n)+\frac{1}{n}}{2b\sqrt{f}\,\sqrt{\log(F)}}\right)}{2be^2\sqrt{f}\,n\sqrt{\log(F)}}+\frac{\sqrt{\pi}\,h(d+ex)^2\,(c(d+$$

```
[Out] 1/2*h*(e*x+d)^2*erfi((1/n+a*b*f*ln(F)+b^2*f*ln(F)*ln(c*(e*x+d)^n))/b/f^(1/2
)/ln(F)^(1/2))*Pi^(1/2)/b/e^2/exp((1+2*a*b*f*n*ln(F))/b^2/f/n^2/ln(F))/n/((
c*(e*x+d)^n)^(2/n))/f^(1/2)/ln(F)^(1/2)+1/2*(-d*h+e*g)*(e*x+d)*erfi(1/2*(1/
n+2*a*b*f*ln(F)+2*b^2*f*ln(F)*ln(c*(e*x+d)^n))/b/f^(1/2)/ln(F)^(1/2))*Pi^(1
/2)/b/e^2/exp(1/4*(1+4*a*b*f*n*ln(F))/b^2/f/n^2/ln(F))/n/((c*(e*x+d)^n)^(1/
n))/f^(1/2)/ln(F)^(1/2)
```

Rubi [F] time = 0.31, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int F^{f\left(a+b\log(c(d+ex)^n)\right)^2}(g+hx)\,dx$$

Verification is Not applicable to the result.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n])^2)*(g + h*x),x]
```

```
[Out] (g*Sqrt[Pi]*(d + e*x)*Erfi[(n^(-1) + 2*a*b*f*Log[F] + 2*b^2*f*Log[F]*Log[c*
(d + e*x)^n])/(2*b*Sqrt[f]*Sqrt[Log[F]])])/(2*b*e*E^((1 + 4*a*b*f*n*Log[F])
/(4*b^2*f*n^2*Log[F]))*Sqrt[f]*n*(c*(d + e*x)^n)^n^(-1)*Sqrt[Log[F]]) + h*D
efer[Int][F^(f*(a + b*Log[c*(d + e*x)^n])^2)*x, x]
```

Rubi steps

$$\int F^{f\left(a+b\log(c(d+ex)^n)\right)^2}(g+hx)\,dx = \int \left(F^{f\left(a+b\log(c(d+ex)^n)\right)^2}g + F^{f\left(a+b\log(c(d+ex)^n)\right)^2}hx\right)dx$$

$$= g\int F^{f\left(a+b\log(c(d+ex)^n)\right)^2}dx + h\int F^{f\left(a+b\log(c(d+ex)^n)\right)^2}x\,dx$$

$$= \frac{g\,\mathrm{Subst}\left(\int F^{f\left(a+b\log(cx^n)\right)^2}dx, x, d+ex\right)}{e} + h\int F^{f\left(a+b\log(c(d+ex)^n)\right)^2}x\,dx$$

$$= \frac{g\,\mathrm{Subst}\left(\int F^{a^2f+2abf\log(cx^n)+b^2f\log^2(cx^n)}dx, x, d+ex\right)}{e} + h\int F^{f\left(a+b\log(c(d+ex)^n)\right)}$$

$$= \frac{g\,\mathrm{Subst}\left(\int F^{a^2f+b^2f\log^2(cx^n)}(cx^n)^{2abf\log(F)}\,dx, x, d+ex\right)}{e} + h\int F^{f\left(a+b\log(c(d+ex\right.}$$

$$= h\int F^{f\left(a+b\log(c(d+ex)^n)\right)^2}x\,dx + \frac{\left(g(d+ex)^{-2abfn\log(F)}(c(d+ex)^n)^{2abf\log(F)}\right)\mathrm{Sub}}{e}$$

$$= h\int F^{f\left(a+b\log(c(d+ex)^n)\right)^2}x\,dx + \frac{\left(g(d+ex)(c(d+ex)^n)^{2abf\log(F)-\frac{1+2abfn\log(F)}{n}}\right)\mathrm{Sub}}{}$$

$$= h\int F^{f\left(a+b\log(c(d+ex)^n)\right)^2}x\,dx + \frac{\left(\exp\left(a^2f\log(F)-\frac{(1+2abfn\log(F))^2}{4b^2fn^2\log(F)}\right)g(d+ex)(c\right.}{}$$

$$= \frac{e^{-\frac{1+4abfn\log(F)}{4b^2fn^2\log(F)}}g\sqrt{\pi}(d+ex)(c(d+ex)^n)^{-1/n}\operatorname{erfi}\left(\frac{\frac{1}{n}+2abf\log(F)+2b^2f\log(F)\log(c(d+ex\right.}{2b\sqrt{f}\sqrt{\log(F)}}}{2be\sqrt{f}\,n\sqrt{\log(F)}}$$

Mathematica [A] time = 0.52, size = 221, normalized size = 0.86

$$\frac{\sqrt{\pi}(d+ex)(c(d+ex)^n)^{-2/n}e^{-\frac{2abfn\log(F)+1}{b^2fn^2\log(F)}}\left((eg-dh)(c(d+ex)^n)^{\frac{1}{n}}e^{\frac{4abfn\log(F)+3}{4b^2fn^2\log(F)}}\operatorname{erfi}\left(\frac{2bfn\log(F)\left(a+b\log(c(d+ex)^n)\right)+1}{2b\sqrt{f}\,n\sqrt{\log(F)}}\right)+h\right.}{2be^2\sqrt{f}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n])^2)*(g + h*x),x]
```

```
[Out] (Sqrt[Pi]*(d + e*x)*(h*(d + e*x)*Erfi[(1 + b*f*n*Log[F]*(a + b*Log[c*(d + e
*x)^n]))/(b*Sqrt[f]*n*Sqrt[Log[F]])] + E^((3 + 4*a*b*f*n*Log[F])/(4*b^2*f*n
^2*Log[F]))*(e*g - d*h)*(c*(d + e*x)^n)^n^(-1)*Erfi[(1 + 2*b*f*n*Log[F]*(a
```

```
+ b*Log[c*(d + e*x)^n]))/(2*b*Sqrt[f]*n*Sqrt[Log[F]])]))/(2*b*e^2*E^((1 + 2
*a*b*f*n*Log[F])/(b^2*f*n^2*Log[F]))*Sqrt[f]*n*(c*(d + e*x)^n)^(2/n)*Sqrt[L
og[F]])
```

fricas [A] time = 0.42, size = 259, normalized size = 1.01

$$-\frac{\sqrt{\pi}\sqrt{-b^2fn^2\log(F)}\left(eg-dh\right)\operatorname{erf}\left(\frac{\left(2\,b^2fn^2\log(ex+d)\log(F)+2\,b^2fn\log(F)\log(c)+2\,abfn\log(F)+1\right)\sqrt{-b^2fn^2\log(F)}}{2\,b^2fn^2\log(F)}\right)e^{\left(-\frac{4\,b^2fn\log(}{}\right.}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)*(h*x+g),x, algorithm="fricas")
```

```
[Out] -1/2*(sqrt(pi)*sqrt(-b^2*f*n^2*log(F))*(e*g - d*h)*erf(1/2*(2*b^2*f*n^2*log
(e*x + d)*log(F) + 2*b^2*f*n*log(F)*log(c) + 2*a*b*f*n*log(F) + 1)*sqrt(-b^
2*f*n^2*log(F))/(b^2*f*n^2*log(F)))*e^(-1/4*(4*b^2*f*n*log(F)*log(c) + 4*a*
b*f*n*log(F) + 1)/(b^2*f*n^2*log(F))) + sqrt(pi)*sqrt(-b^2*f*n^2*log(F))*h*
erf((b^2*f*n^2*log(e*x + d)*log(F) + b^2*f*n*log(F)*log(c) + a*b*f*n*log(F)
 + 1)*sqrt(-b^2*f*n^2*log(F))/(b^2*f*n^2*log(F)))*e^(-(2*b^2*f*n*log(F)*log
(c) + 2*a*b*f*n*log(F) + 1)/(b^2*f*n^2*log(F))))/(b*e^2*n)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(hx+g\right)F^{\left(b\log\left(\left(ex+d\right)^{n}c\right)+a\right)^{2}f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)*(h*x+g),x, algorithm="giac")
```

```
[Out] integrate((h*x + g)*F^((b*log((e*x + d)^n*c) + a)^2*f), x)
```

maple [F] time = 0.80, size = 0, normalized size = 0.00

$$\int \left(hx+g\right)F^{\left(b\ln\left(c\left(ex+d\right)^{n}\right)+a\right)^{2}f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^((b*ln(c*(e*x+d)^n)+a)^2*f)*(h*x+g),x)
```

```
[Out] int(F^((b*ln(c*(e*x+d)^n)+a)^2*f)*(h*x+g),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(hx+g\right)F^{\left(b\log\left(\left(ex+d\right)^{n}c\right)+a\right)^{2}f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)*(h*x+g),x, algorithm="maxima")
[Out] integrate((h*x + g)*F^((b*log((e*x + d)^n*c) + a)^2*f), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int e^{f\,\ln(F)\,\left(a+b\,\ln\left(c\,(d+e\,x)^n\right)\right)^2}\,\left(g+h\,x\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n))^2)*(g + h*x),x)
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n))^2)*(g + h*x), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n))**2)*(h*x+g),x)
[Out] Timed out
```

3.613 $\int F^{f\left(a+b\log(c(d+ex)^n)\right)^2}\,dx$

Optimal. Leaf size=126

$$\frac{\sqrt{\pi}\,(d+ex)\left(c(d+ex)^n\right)^{-1/n}e^{-\frac{4abfn\log(F)+1}{4b^2fn^2\log(F)}}\operatorname{erfi}\left(\frac{2abf\log(F)+2b^2f\log(F)\log(c(d+ex)^n)+\frac{1}{n}}{2b\sqrt{f}\,\sqrt{\log(F)}}\right)}{2be\sqrt{f}\,n\sqrt{\log(F)}}$$

```
[Out] 1/2*(e*x+d)*erfi(1/2*(1/n+2*a*b*f*ln(F)+2*b^2*f*ln(F)*ln(c*(e*x+d)^n))/b/f^
(1/2)/ln(F)^(1/2))*Pi^(1/2)/b/e/exp(1/4*(1+4*a*b*f*n*ln(F))/b^2/f/n^2/ln(F)
)/n/((c*(e*x+d)^n)^(1/n))/f^(1/2)/ln(F)^(1/2)
```

Rubi [A] time = 0.14, antiderivative size = 126, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.300, Rules used = {2277, 2274, 15, 2276, 2234, 2204}

$$\frac{\sqrt{\pi}\,(d+ex)\left(c(d+ex)^n\right)^{-1/n}e^{-\frac{4abfn\log(F)+1}{4b^2fn^2\log(F)}}\text{Erfi}\left(\frac{2abf\log(F)+2b^2f\log(F)\log(c(d+ex)^n)+\frac{1}{n}}{2b\sqrt{f}\,\sqrt{\log(F)}}\right)}{2be\sqrt{f}\,n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n])^2),x]
```

```
[Out] (Sqrt[Pi]*(d + e*x)*Erfi[(n^(-1) + 2*a*b*f*Log[F] + 2*b^2*f*Log[F]*Log[c*(d
 + e*x)^n])/(2*b*Sqrt[f]*Sqrt[Log[F]])])/(2*b*e*E^((1 + 4*a*b*f*n*Log[F])/(
4*b^2*f*n^2*Log[F]))*Sqrt[f]*n*(c*(d + e*x)^n)^n^(-1)*Sqrt[Log[F]])
```

Rule 15

```
Int[(u_.)*((a_.)*(x_)^(n_))^(m_), x_Symbol] :> Dist[(a^IntPart[m]*(a*x^n)^F
racPart[m])/x^(n*FracPart[m]), Int[u*x^(m*n), x], x] /; FreeQ[{a, m, n}, x]
 && !IntegerQ[m]
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2234

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> Dist[F^(a - b^2/
(4*c)), Int[F^((b + 2*c*x)^2/(4*c)), x], x] /; FreeQ[{F, a, b, c}, x]
```

Rule 2274

```
Int[(u_.)*(F_)^((a_.)*(Log[z_]*(b_.) + (v_.))), x_Symbol] :> Int[u*F^(a*v)*
z^(a*b*Log[F]), x] /; FreeQ[{F, a, b}, x]
```

Rule 2276

```
Int[(F_)^(((a_.) + Log[(c_.)*(x_)^(n_.)]^2*(b_.))*(d_.))*((e_.)*(x_))^(m_.)
, x_Symbol] :> Dist[(e*x)^(m + 1)/(e*n*(c*x^n)^((m + 1)/n)), Subst[Int[E^(a
*d*Log[F] + ((m + 1)*x)/n + b*d*Log[F]*x^2), x], x, Log[c*x^n]], x] /; Free
Q[{F, a, b, c, d, e, m, n}, x]
```

Rule 2277

```
Int[(F_)^(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^2*(d_.)), x_Symbol] :> Int[
F^(a^2*d + 2*a*b*d*Log[c*x^n] + b^2*d*Log[c*x^n]^2), x] /; FreeQ[{F, a, b,
c, d, n}, x]
```

Rubi steps

$$\int F^{f\left(a+b\log(c(d+ex)^n)\right)^2}dx = \frac{\text{Subst}\left(\int F^{f\left(a+b\log(cx^n)\right)^2}dx, x, d+ex\right)}{e}$$
$$= \frac{\text{Subst}\left(\int F^{a^2f+2abf\log(cx^n)+b^2f\log^2(cx^n)}dx, x, d+ex\right)}{e}$$
$$= \frac{\text{Subst}\left(\int F^{a^2f+b^2f\log^2(cx^n)}\left(cx^n\right)^{2abf\log(F)}dx, x, d+ex\right)}{e}$$
$$= \frac{\left((d+ex)^{-2abfn\log(F)}\left(c(d+ex)^n\right)^{2abf\log(F)}\right)\text{Subst}\left(\int F^{a^2f+b^2f\log^2(cx^n)}x^{2abfn\log(F)}dx, x\right.}{e}$$
$$= \frac{\left((d+ex)\left(c(d+ex)^n\right)^{2abf\log(F)-\frac{1+2abfn\log(F)}{n}}\right)\text{Subst}\left(\int\exp\left(a^2f\log(F)+b^2fx^2\log(F)\right.\right.}{en}$$
$$= \frac{\left(\exp\left(a^2f\log(F)-\frac{(1+2abfn\log(F))^2}{4b^2fn^2\log(F)}\right)(d+ex)\left(c(d+ex)^n\right)^{2abf\log(F)-\frac{1+2abfn\log(F)}{n}}\right)\text{Subst}}{en}$$
$$= \frac{e^{-\frac{1+4abfn\log(F)}{4b^2fn^2\log(F)}}\sqrt{\pi}(d+ex)\left(c(d+ex)^n\right)^{-1/n}\text{erfi}\left(\frac{\frac{1}{n}+2abf\log(F)+2b^2f\log(F)\log(c(d+ex)^n)}{2b\sqrt{f}\sqrt{\log(F)}}\right)}{2be\sqrt{f}n\sqrt{\log(F)}}$$

Mathematica [A] time = 0.07, size = 123, normalized size = 0.98

$$\frac{\sqrt{\pi}(d+ex)\left(c(d+ex)^n\right)^{-1/n}e^{-\frac{4abfn\log(F)+1}{4b^2fn^2\log(F)}}\text{erfi}\left(\frac{2bfn\log(F)\left(a+b\log(c(d+ex)^n)\right)+1}{2b\sqrt{f}n\sqrt{\log(F)}}\right)}{2be\sqrt{f}n\sqrt{\log(F)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n])^2),x]
```

```
[Out] (Sqrt[Pi]*(d + e*x)*Erfi[(1 + 2*b*f*n*Log[F]*(a + b*Log[c*(d + e*x)^n]))/(2
*b*Sqrt[f]*n*Sqrt[Log[F]])])/(2*b*e*E^((1 + 4*a*b*f*n*Log[F])/(4*b^2*f*n^2*
Log[F]))*Sqrt[f]*n*(c*(d + e*x)^n)^n^(-1)*Sqrt[Log[F]])
```

fricas [A] time = 0.40, size = 131, normalized size = 1.04

$$-\frac{\sqrt{\pi}\sqrt{-b^2fn^2\log(F)}\,\text{erf}\left(\frac{\left(2b^2fn^2\log(ex+d)\log(F)+2b^2fn\log(F)\log(c)+2abfn\log(F)+1\right)\sqrt{-b^2fn^2\log(F)}}{2b^2fn^2\log(F)}\right)e^{\left(-\frac{4b^2fn\log(F)\log(c)+4abf}{4b^2fn^2\log(F)}\right.}}{2ben}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2),x, algorithm="fricas")
```

```
[Out] -1/2*sqrt(pi)*sqrt(-b^2*f*n^2*log(F))*erf(1/2*(2*b^2*f*n^2*log(e*x + d)*log
(F) + 2*b^2*f*n*log(F)*log(c) + 2*a*b*f*n*log(F) + 1)*sqrt(-b^2*f*n^2*log(F
))/(b^2*f*n^2*log(F)))*e^(-1/4*(4*b^2*f*n*log(F)*log(c) + 4*a*b*f*n*log(F)
+ 1)/(b^2*f*n^2*log(F)))/(b*e*n)
```

giac [A] time = 0.55, size = 116, normalized size = 0.92

$$-\frac{\sqrt{\pi}\,\operatorname{erf}\left(-\sqrt{-f\log(F)}\,bn\log\left(xe+d\right)-\sqrt{-f\log(F)}\,b\log(c)-\sqrt{-f\log(F)}\,a-\frac{\sqrt{-f\log(F)}}{2\,bfn\log(F)}\right)e^{\left(-\frac{a}{bn}-\frac{1}{4\,b^{2}fn^{2}\log(F)}-1\right)}}{2\,\sqrt{-f\log(F)}\,bc^{\left(\frac{1}{n}\right)}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2),x, algorithm="giac")
```

```
[Out] -1/2*sqrt(pi)*erf(-sqrt(-f*log(F))*b*n*log(x*e + d) - sqrt(-f*log(F))*b*log
(c) - sqrt(-f*log(F))*a - 1/2*sqrt(-f*log(F))/(b*f*n*log(F)))*e^(-a/(b*n) -
 1/4/(b^2*f*n^2*log(F)) - 1)/(sqrt(-f*log(F))*b*c^(1/n)*n)
```

maple [F] time = 0.02, size = 0, normalized size = 0.00

$$\int F^{\left(b\ln\left(c(ex+d)^{n}\right)+a\right)^{2}f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^((b*ln(c*(e*x+d)^n)+a)^2*f),x)
```

```
[Out] int(F^((b*ln(c*(e*x+d)^n)+a)^2*f),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{\left(b\log\left((ex+d)^{n}c\right)+a\right)^{2}f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2),x, algorithm="maxima")
```

```
[Out] integrate(F^((b*log((e*x + d)^n*c) + a)^2*f), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \mathrm{e}^{f\,\ln(F)\,\left(a+b\,\ln\left(c\,(d+e\,x)^{n}\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n))^2),x)
```

```
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n))^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int F^{f\left(a+b\log\left(c(d+ex)^n\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n))**2),x)
```

```
[Out] Integral(F**(f*(a + b*log(c*(d + e*x)**n))**2), x)
```

3.614 $\int \frac{F^{f\left(a+b\log\left(c(d+ex)^n\right)\right)^2}}{g+hx}\,dx$

Optimal. Leaf size=31

$$\operatorname{Int}\left(\frac{F^{f\left(a+b\log\left(c(d+ex)^n\right)\right)^2}}{g+hx},x\right)$$

```
[Out] Unintegrable(F^(f*(a+b*ln(c*(e*x+d)^n))^2)/(h*x+g),x)
```

Rubi [A] time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{F^{f\left(a+b\log\left(c(d+ex)^n\right)\right)^2}}{g+hx}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n])^2)/(g + h*x),x]
[Out] Defer[Int][F^(f*(a + b*Log[c*(d + e*x)^n])^2)/(g + h*x), x]
```

Rubi steps

$$\int \frac{F^{f\left(a+b\log\left(c(d+ex)^n\right)\right)^2}}{g+hx}\,dx=\int \frac{F^{f\left(a+b\log\left(c(d+ex)^n\right)\right)^2}}{g+hx}\,dx$$

Mathematica [A] time = 0.99, size = 0, normalized size = 0.00

$$\int \frac{F^{f\left(a+b\log\left(c(d+ex)^n\right)\right)^2}}{g+hx}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n])^2)/(g + h*x),x]
[Out] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n])^2)/(g + h*x), x]
```

fricas [A] time = 0.42, size = 0, normalized size = 0.00

$$\operatorname{integral}\left(\frac{F^{b^2 f\log\left((ex+d)^n c\right)^2+2\,abf\log\left((ex+d)^n c\right)+a^2 f}}{hx+g},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)/(h*x+g),x, algorithm="fricas")
```

```
[Out] integral(F^(b^2*f*log((e*x + d)^n*c)^2 + 2*a*b*f*log((e*x + d)^n*c) + a^2*f
)/(h*x + g), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{\left(b \log\left(\left(ex+d\right)^{n} c\right)+a\right)^{2} f}}{hx+g}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)/(h*x+g),x, algorithm="giac")
```

```
[Out] integrate(F^((b*log((e*x + d)^n*c) + a)^2*f)/(h*x + g), x)
```

maple [A] time = 0.67, size = 0, normalized size = 0.00

$$\int \frac{F^{\left(b \ln\left(c\left(ex+d\right)^{n}\right)+a\right)^{2} f}}{hx+g}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^((b*ln(c*(e*x+d)^n)+a)^2*f)/(h*x+g),x)
```

```
[Out] int(F^((b*ln(c*(e*x+d)^n)+a)^2*f)/(h*x+g),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{\left(b \log\left(\left(ex+d\right)^{n} c\right)+a\right)^{2} f}}{hx+g}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)/(h*x+g),x, algorithm="maxima")
```

```
[Out] integrate(F^((b*log((e*x + d)^n*c) + a)^2*f)/(h*x + g), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{\mathrm{e}^{f\,\ln(F)\,\left(a+b\,\ln\left(c\,{\left(d+e\,x\right)}^n\right)\right)^2}}{g+h\,x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n))^2)/(g + h*x),x)
```

```
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n))^2)/(g + h*x), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{f\left(a+b\log\left(c(d+ex)^n\right)\right)^2}}{g+hx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n))**2)/(h*x+g),x)
```

```
[Out] Integral(F**(f*(a + b*log(c*(d + e*x)**n))**2)/(g + h*x), x)
```

3.615 $\int \frac{F^{f\left(a+b\log\left(c(d+ex)^n\right)\right)^2}}{(g+hx)^2}\,dx$

Optimal. Leaf size=31

$$\text{Int}\left(\frac{F^{f\left(a+b\log\left(c(d+ex)^n\right)\right)^2}}{(g+hx)^2},x\right)$$

```
[Out] Unintegrable(F^(f*(a+b*ln(c*(e*x+d)^n))^2)/(h*x+g)^2,x)
```

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{F^{f\left(a+b\log\left(c(d+ex)^n\right)\right)^2}}{(g+hx)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n])^2)/(g + h*x)^2,x]
```

```
[Out] Defer[Int][F^(f*(a + b*Log[c*(d + e*x)^n])^2)/(g + h*x)^2, x]
```

Rubi steps

$$\int \frac{F^{f\left(a+b\log\left(c(d+ex)^n\right)\right)^2}}{(g+hx)^2}\,dx = \int \frac{F^{f\left(a+b\log\left(c(d+ex)^n\right)\right)^2}}{(g+hx)^2}\,dx$$

Mathematica [A] time = 4.65, size = 0, normalized size = 0.00

$$\int \frac{F^{f\left(a+b\log\left(c(d+ex)^n\right)\right)^2}}{(g+hx)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n])^2)/(g + h*x)^2,x]
```

```
[Out] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n])^2)/(g + h*x)^2, x]
```

fricas [A] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{F^{b^2 f\log\left((ex+d)^n c\right)^2+2\,abf\log\left((ex+d)^n c\right)+a^2 f}}{h^2x^2+2\,ghx+g^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)/(h*x+g)^2,x, algorithm="fricas")
```

```
[Out] integral(F^(b^2*f*log((e*x + d)^n*c)^2 + 2*a*b*f*log((e*x + d)^n*c) + a^2*f
)/(h^2*x^2 + 2*g*h*x + g^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{\left(b\log\left((ex+d)^n c\right)+a\right)^2 f}}{\left(hx+g\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)/(h*x+g)^2,x, algorithm="giac")
```

```
[Out] integrate(F^((b*log((e*x + d)^n*c) + a)^2*f)/(h*x + g)^2, x)
```

maple [A] time = 0.75, size = 0, normalized size = 0.00

$$\int \frac{F^{\left(b\ln\left(c(ex+d)^n\right)+a\right)^2 f}}{\left(hx+g\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^((b*ln(c*(e*x+d)^n)+a)^2*f)/(h*x+g)^2,x)
```

```
[Out] int(F^((b*ln(c*(e*x+d)^n)+a)^2*f)/(h*x+g)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{\left(b\log\left((ex+d)^n c\right)+a\right)^2 f}}{\left(hx+g\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)/(h*x+g)^2,x, algorithm="maxima")
```

```
[Out] integrate(F^((b*log((e*x + d)^n*c) + a)^2*f)/(h*x + g)^2, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{\mathrm{e}^{f\,\ln(F)\,\left(a+b\,\ln\left(c\,(d+e\,x)^n\right)\right)^2}}{\left(g+h\,x\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n))^2)/(g + h*x)^2,x)
```

```
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n))^2)/(g + h*x)^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n))**2)/(h*x+g)**2,x)
```

```
[Out] Timed out
```

3.616 $\int \frac{F^{f\left(a+b\log\left(c(d+ex)^n\right)\right)^2}}{(g+hx)^3}\,dx$

Optimal. Leaf size=31

$$\mathrm{Int}\left(\frac{F^{f\left(a+b\log\left(c(d+ex)^n\right)\right)^2}}{(g+hx)^3},x\right)$$

```
[Out] Unintegrable(F^(f*(a+b*ln(c*(e*x+d)^n))^2)/(h*x+g)^3,x)
```

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{F^{f\left(a+b\log\left(c(d+ex)^n\right)\right)^2}}{(g+hx)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[F^(f*(a + b*Log[c*(d + e*x)^n])^2)/(g + h*x)^3,x]
```

```
[Out] Defer[Int][F^(f*(a + b*Log[c*(d + e*x)^n])^2)/(g + h*x)^3, x]
```

Rubi steps

$$\int \frac{F^{f\left(a+b\log\left(c(d+ex)^n\right)\right)^2}}{(g+hx)^3}\,dx=\int \frac{F^{f\left(a+b\log\left(c(d+ex)^n\right)\right)^2}}{(g+hx)^3}\,dx$$

Mathematica [A] time = 7.11, size = 0, normalized size = 0.00

$$\int \frac{F^{f\left(a+b\log\left(c(d+ex)^n\right)\right)^2}}{(g+hx)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n])^2)/(g + h*x)^3,x]
```

```
[Out] Integrate[F^(f*(a + b*Log[c*(d + e*x)^n])^2)/(g + h*x)^3, x]
```

fricas [A] time = 0.42, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{F^{b^2 f\log\left((ex+d)^n c\right)^2+2\,abf\log\left((ex+d)^n c\right)+a^2 f}}{h^3x^3+3\,gh^2x^2+3\,g^2hx+g^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)/(h*x+g)^3,x, algorithm="fricas")
```

```
[Out] integral(F^(b^2*f*log((e*x + d)^n*c)^2 + 2*a*b*f*log((e*x + d)^n*c) + a^2*f
)/(h^3*x^3 + 3*g*h^2*x^2 + 3*g^2*h*x + g^3), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{\left(b\log\left((ex+d)^{n}c\right)+a\right)^{2}f}}{\left(hx+g\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)/(h*x+g)^3,x, algorithm="giac")
```

```
[Out] integrate(F^((b*log((e*x + d)^n*c) + a)^2*f)/(h*x + g)^3, x)
```

maple [A] time = 1.04, size = 0, normalized size = 0.00

$$\int \frac{F^{\left(b\ln\left(c(ex+d)^{n}\right)+a\right)^{2}f}}{\left(hx+g\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^((b*ln(c*(e*x+d)^n)+a)^2*f)/(h*x+g)^3,x)
```

```
[Out] int(F^((b*ln(c*(e*x+d)^n)+a)^2*f)/(h*x+g)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F^{\left(b\log\left((ex+d)^{n}c\right)+a\right)^{2}f}}{\left(hx+g\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(f*(a+b*log(c*(e*x+d)^n))^2)/(h*x+g)^3,x, algorithm="maxima")
```

```
[Out] integrate(F^((b*log((e*x + d)^n*c) + a)^2*f)/(h*x + g)^3, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{\mathrm{e}^{f\,\ln(F)\,\left(a+b\,\ln\left(c\,{(d+e\,x)}^{n}\right)\right)^{2}}}{\left(g+h\,x\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(f*(a + b*log(c*(d + e*x)^n))^2)/(g + h*x)^3,x)
```

```
[Out] int(exp(f*log(F)*(a + b*log(c*(d + e*x)^n))^2)/(g + h*x)^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(f*(a+b*ln(c*(e*x+d)**n))**2)/(h*x+g)**3,x)
```

```
[Out] Timed out
```

3.617 $\int F^{a+bx+cx^3}\left(b+3cx^2\right)\,dx$

Optimal. Leaf size=17

$$\frac{F^{a+bx+cx^3}}{\log(F)}$$

```
[Out] F^(c*x^3+b*x+a)/ln(F)
```

Rubi [A] time = 0.05, antiderivative size = 17, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {6706}

$$\frac{F^{a+bx+cx^3}}{\log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[F^(a + b*x + c*x^3)*(b + 3*c*x^2),x]
```

```
[Out] F^(a + b*x + c*x^3)/Log[F]
```

Rule 6706

```
Int[(F_)^(v_)*(u_), x_Symbol] :> With[{q = DerivativeDivides[v, u, x]}, Sim
p[(q*F^v)/Log[F], x] /;  !FalseQ[q]] /; FreeQ[F, x]
```

Rubi steps

$$\int F^{a+bx+cx^3}\left(b+3cx^2\right)\,dx=\frac{F^{a+bx+cx^3}}{\log(F)}$$

Mathematica [A] time = 0.06, size = 17, normalized size = 1.00

$$\frac{F^{a+bx+cx^3}}{\log(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[F^(a + b*x + c*x^3)*(b + 3*c*x^2),x]
```

```
[Out] F^(a + b*x + c*x^3)/Log[F]
```

fricas [A] time = 0.43, size = 17, normalized size = 1.00

$$\frac{F^{cx^3+bx+a}}{\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(c*x^3+b*x+a)*(3*c*x^2+b),x, algorithm="fricas")
[Out] F^(c*x^3 + b*x + a)/log(F)
```

giac [A] time = 0.23, size = 17, normalized size = 1.00

$$\frac{F^{cx^3+bx+a}}{\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(c*x^3+b*x+a)*(3*c*x^2+b),x, algorithm="giac")
[Out] F^(c*x^3 + b*x + a)/log(F)
```

maple [A] time = 0.03, size = 18, normalized size = 1.06

$$\frac{F^{c\,x^3+bx+a}}{\ln(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(c*x^3+b*x+a)*(3*c*x^2+b),x)
[Out] F^(c*x^3+b*x+a)/ln(F)
```

maxima [A] time = 1.00, size = 17, normalized size = 1.00

$$\frac{F^{cx^3+bx+a}}{\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(c*x^3+b*x+a)*(3*c*x^2+b),x, algorithm="maxima")
[Out] F^(c*x^3 + b*x + a)/log(F)
```

mupad [B] time = 3.68, size = 17, normalized size = 1.00

$$\frac{F^{c\,x^3+b\,x+a}}{\ln(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(a + b*x + c*x^3)*(b + 3*c*x^2),x)
```

```
[Out] F^(a + b*x + c*x^3)/log(F)
```

sympy [A] time = 0.14, size = 24, normalized size = 1.41

$$\begin{cases} \frac{F^{a+bx+cx^3}}{\log(F)} & \text{for } \log(F) \neq 0 \\ bx + cx^3 & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(c*x**3+b*x+a)*(3*c*x**2+b),x)
```

```
[Out] Piecewise((F**(a + b*x + c*x**3)/log(F), Ne(log(F), 0)), (b*x + c*x**3, Tru
e))
```

3.618 $\int \frac{F^{\frac{1}{a+bx+cx^2}}(b+2cx)}{\left(a+bx+cx^2\right)^2}\,dx$

Optimal. Leaf size=20

$$-\frac{F^{\frac{1}{a+bx+cx^2}}}{\log(F)}$$

```
[Out] -F^(1/(c*x^2+b*x+a))/ln(F)
```

Rubi [A] time = 0.17, antiderivative size = 20, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.030, Rules used = {6706}

$$-\frac{F^{\frac{1}{a+bx+cx^2}}}{\log(F)}$$

Antiderivative was successfully verified.

```
[In] Int[(F^(a + b*x + c*x^2)^(-1)*(b + 2*c*x))/(a + b*x + c*x^2)^2,x]
```

```
[Out] -(F^(a + b*x + c*x^2)^(-1)/Log[F])
```

Rule 6706

```
Int[(F_)^(v_)*(u_), x_Symbol] :> With[{q = DerivativeDivides[v, u, x]}, Sim
p[(q*F^v)/Log[F], x] /;  !FalseQ[q]] /; FreeQ[F, x]
```

Rubi steps

$$\int \frac{F^{\frac{1}{a+bx+cx^2}}(b+2cx)}{\left(a+bx+cx^2\right)^2}\,dx = -\frac{F^{\frac{1}{a+bx+cx^2}}}{\log(F)}$$

Mathematica [A] time = 0.42, size = 19, normalized size = 0.95

$$-\frac{F^{\frac{1}{a+x(b+cx)}}}{\log(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(F^(a + b*x + c*x^2)^(-1)*(b + 2*c*x))/(a + b*x + c*x^2)^2,x]
```

```
[Out] -(F^(a + x*(b + c*x))^(-1)/Log[F])
```

fricas [A] time = 0.41, size = 20, normalized size = 1.00

$$-\frac{F^{\left(\frac{1}{cx^2+bx+a}\right)}}{\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(1/(c*x^2+b*x+a))*(2*c*x+b)/(c*x^2+b*x+a)^2,x, algorithm="frica
s")
```

```
[Out] -F^(1/(c*x^2 + b*x + a))/log(F)
```

giac [A] time = 0.22, size = 20, normalized size = 1.00

$$-\frac{F^{\left(\frac{1}{cx^2+bx+a}\right)}}{\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(1/(c*x^2+b*x+a))*(2*c*x+b)/(c*x^2+b*x+a)^2,x, algorithm="giac"
)
```

```
[Out] -F^(1/(c*x^2 + b*x + a))/log(F)
```

maple [A] time = 0.03, size = 21, normalized size = 1.05

$$-\frac{F^{\frac{1}{c\,x^2+bx+a}}}{\ln(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F^(1/(c*x^2+b*x+a))*(2*c*x+b)/(c*x^2+b*x+a)^2,x)
```

```
[Out] -F^(1/(c*x^2+b*x+a))/ln(F)
```

maxima [A] time = 0.95, size = 20, normalized size = 1.00

$$-\frac{F^{\left(\frac{1}{cx^2+bx+a}\right)}}{\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F^(1/(c*x^2+b*x+a))*(2*c*x+b)/(c*x^2+b*x+a)^2,x, algorithm="maxim
a")
```

```
[Out] -F^(1/(c*x^2 + b*x + a))/log(F)
```

mupad [B] time = 4.00, size = 20, normalized size = 1.00

$$-\frac{F^{\frac{1}{c\,x^2+b\,x+a}}}{\ln(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((F^(1/(a + b*x + c*x^2))*(b + 2*c*x))/(a + b*x + c*x^2)^2,x)
```

```
[Out] -F^(1/(a + b*x + c*x^2))/log(F)
```

sympy [A] time = 0.57, size = 32, normalized size = 1.60

$$\begin{cases} -\frac{F^{\frac{1}{a+bx+cx^2}}}{\log(F)} & \text{for}\ \log(F) \neq 0 \\ -\frac{1}{a+bx+cx^2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F**(1/(c*x**2+b*x+a))*(2*c*x+b)/(c*x**2+b*x+a)**2,x)
```

```
[Out] Piecewise((-F**(1/(a + b*x + c*x**2))/log(F), Ne(log(F), 0)), (-1/(a + b*x
+ c*x**2), True))
```

3.619 $\int e^{a+bx+cx^2}(b+2cx)\left(a+bx+cx^2\right)^m\,dx$

Optimal. Leaf size=49

$$\left(-a-bx-cx^2\right)^{-m}\left(a+bx+cx^2\right)^m\Gamma\left(m+1,-cx^2-bx-a\right)$$

```
[Out] (c*x^2+b*x+a)^m*GAMMA(1+m,-c*x^2-b*x-a)/((-c*x^2-b*x-a)^m)
```

Rubi [A] time = 0.20, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.065, Rules used = {6707, 2181}

$$\left(-a-bx-cx^2\right)^{-m}\left(a+bx+cx^2\right)^m\text{Gamma}\left(m+1,-a-bx-cx^2\right)$$

Antiderivative was successfully verified.

```
[In] Int[E^(a + b*x + c*x^2)*(b + 2*c*x)*(a + b*x + c*x^2)^m,x]
```

```
[Out] ((a + b*x + c*x^2)^m*Gamma[1 + m, -a - b*x - c*x^2])/(-a - b*x - c*x^2)^m
```

Rule 2181

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> -Simp[(F^(g*(e - (c*f)/d))*(c + d*x)^FracPart[m]*Gamma[m + 1, (-((f*g*Lo
g[F])/d))*(c + d*x)])/(d*(-((f*g*Log[F])/d))^(IntPart[m] + 1)*(-((f*g*Log[F
]*(c + d*x))/d))^FracPart[m]), x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&  !I
ntegerQ[m]
```

Rule 6707

```
Int[(F_)^(v_)*(u_)*(w_)^(m_.), x_Symbol] :> With[{q = DerivativeDivides[v,
u, x]}, Dist[q, Subst[Int[x^m*F^x, x], x, v], x] /;  !FalseQ[q]] /; FreeQ[{
F, m}, x] && EqQ[w, v]
```

Rubi steps

$$\begin{aligned}\int e^{a+bx+cx^2}(b+2cx)\left(a+bx+cx^2\right)^m\,dx &= \text{Subst}\left(\int e^x x^m\,dx, x, a+bx+cx^2\right)\\ &= \left(-a-bx-cx^2\right)^{-m}\left(a+bx+cx^2\right)^m\Gamma\left(1+m,-a-bx-cx^2\right)\end{aligned}$$

Mathematica [A] time = 0.05, size = 44, normalized size = 0.90

$$(-a-x(b+cx))^{-m}(a+x(b+cx))^m\Gamma(m+1,-a-x(b+cx))$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a + b*x + c*x^2)*(b + 2*c*x)*(a + b*x + c*x^2)^m,x]
[Out] ((a + x*(b + c*x))^m*Gamma[1 + m, -a - x*(b + c*x)])/(-a - x*(b + c*x))^m
```

fricas [A] time = 0.42, size = 23, normalized size = 0.47

$$\cos(\pi m)\Gamma\left(m+1,-cx^2-bx-a\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^m,x, algorithm="fricas")
[Out] cos(pi*m)*gamma(m + 1, -c*x^2 - b*x - a)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (2\,cx+b)\left(cx^2+bx+a\right)^m e^{\left(cx^2+bx+a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^m,x, algorithm="giac")
[Out] integrate((2*c*x + b)*(c*x^2 + b*x + a)^m*e^(c*x^2 + b*x + a), x)
```

maple [F] time = 1.02, size = 0, normalized size = 0.00

$$\int (2cx+b)\left(c\,x^2+bx+a\right)^m \mathrm{e}^{c\,x^2+bx+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^m,x)
[Out] int(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^m,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (2\,cx+b)\left(cx^2+bx+a\right)^m e^{\left(cx^2+bx+a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^m,x, algorithm="maxima")
[Out] integrate((2*c*x + b)*(c*x^2 + b*x + a)^m*e^(c*x^2 + b*x + a), x)
```

mupad [B] time = 3.69, size = 49, normalized size = 1.00

$$\frac{\Gamma\left(m+1,-c\,x^2-b\,x-a\right)\,{\left(c\,x^2+b\,x+a\right)}^m}{{\left(-c\,x^2-b\,x-a\right)}^m}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(a + b*x + c*x^2)*(b + 2*c*x)*(a + b*x + c*x^2)^m,x)
[Out] (igamma(m + 1, - a - b*x - c*x^2)*(a + b*x + c*x^2)^m)/(- a - b*x - c*x^2)^
m
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x**2+b*x+a)*(2*c*x+b)*(c*x**2+b*x+a)**m,x)
[Out] Timed out
```

3.620 $\int e^{a+bx+cx^2}(b+2cx)\left(a+bx+cx^2\right)^3\,dx$

Optimal. Leaf size=90

$$e^{a+bx+cx^2}\left(a+bx+cx^2\right)^3-3e^{a+bx+cx^2}\left(a+bx+cx^2\right)^2+6e^{a+bx+cx^2}\left(a+bx+cx^2\right)-6e^{a+bx+cx^2}$$

```
[Out] -6*exp(c*x^2+b*x+a)+6*exp(c*x^2+b*x+a)*(c*x^2+b*x+a)-3*exp(c*x^2+b*x+a)*(c*
x^2+b*x+a)^2+exp(c*x^2+b*x+a)*(c*x^2+b*x+a)^3
```

Rubi [A] time = 0.18, antiderivative size = 90, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {6707, 2176, 2194}

$$e^{a+bx+cx^2}\left(a+bx+cx^2\right)^3-3e^{a+bx+cx^2}\left(a+bx+cx^2\right)^2+6e^{a+bx+cx^2}\left(a+bx+cx^2\right)-6e^{a+bx+cx^2}$$

Antiderivative was successfully verified.

```
[In] Int[E^(a + b*x + c*x^2)*(b + 2*c*x)*(a + b*x + c*x^2)^3,x]
```

```
[Out] -6*E^(a + b*x + c*x^2) + 6*E^(a + b*x + c*x^2)*(a + b*x + c*x^2) - 3*E^(a +
 b*x + c*x^2)*(a + b*x + c*x^2)^2 + E^(a + b*x + c*x^2)*(a + b*x + c*x^2)^3
```

Rule 2176

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_.), x_Symbol] :> Simp[((c + d*x)^m*(b*F^(g*(e + f*x)))^n)/(f*g*n*Log[F]),
x] - Dist[(d*m)/(f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*(b*F^(g*(e + f*x)))^n
, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && GtQ[m, 0] && IntegerQ[2*m
] &&  !$UseGamma === True
```

Rule 2194

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 6707

```
Int[(F_)^(v_)*(u_)*(w_)^(m_.), x_Symbol] :> With[{q = DerivativeDivides[v,
u, x]}, Dist[q, Subst[Int[x^m*F^x, x], x, v], x] /;  !FalseQ[q]] /; FreeQ[{
F, m}, x] && EqQ[w, v]
```

Rubi steps

$$\int e^{a+bx+cx^2}(b+2cx)\left(a+bx+cx^2\right)^3\,dx = \text{Subst}\left(\int e^x x^3\,dx, x, a+bx+cx^2\right)$$
$$= e^{a+bx+cx^2}\left(a+bx+cx^2\right)^3 - 3\,\text{Subst}\left(\int e^x x^2\,dx, x, a+bx+cx^2\right)$$
$$= -3e^{a+bx+cx^2}\left(a+bx+cx^2\right)^2 + e^{a+bx+cx^2}\left(a+bx+cx^2\right)^3 + 6\,\text{Subst}\left(\int\right.$$
$$= 6e^{a+bx+cx^2}\left(a+bx+cx^2\right) - 3e^{a+bx+cx^2}\left(a+bx+cx^2\right)^2 + e^{a+bx+cx^2}\left(a+\right.$$
$$= -6e^{a+bx+cx^2} + 6e^{a+bx+cx^2}\left(a+bx+cx^2\right) - 3e^{a+bx+cx^2}\left(a+bx+cx^2\right)^2 +$$

Mathematica [A] time = 0.04, size = 49, normalized size = 0.54

$$e^{a+x(b+cx)}\left((a+x(b+cx))^3 - 3(a+x(b+cx))^2 + 6(a+x(b+cx)) - 6\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a + b*x + c*x^2)*(b + 2*c*x)*(a + b*x + c*x^2)^3,x]
```

```
[Out] E^(a + x*(b + c*x))*(-6 + 6*(a + x*(b + c*x)) - 3*(a + x*(b + c*x))^2 + (a
+ x*(b + c*x))^3)
```

fricas [A] time = 0.41, size = 109, normalized size = 1.21

$$\left(c^3x^6 + 3\,bc^2x^5 + 3\left(b^2c + (a-1)c^2\right)x^4 + \left(b^3 + 6\,(a-1)bc\right)x^3 + a^3 + 3\left(a^2 - 2\,a + 2\right)bx + 3\left((a-1)b^2 + \left(a^2 - 2\,a\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^3,x, algorithm="fricas")
```

```
[Out] (c^3*x^6 + 3*b*c^2*x^5 + 3*(b^2*c + (a - 1)*c^2)*x^4 + (b^3 + 6*(a - 1)*b*c
)*x^3 + a^3 + 3*(a^2 - 2*a + 2)*b*x + 3*((a - 1)*b^2 + (a^2 - 2*a + 2)*c)*x
^2 - 3*a^2 + 6*a - 6)*e^(c*x^2 + b*x + a)
```

giac [B] time = 0.25, size = 267, normalized size = 2.97

$$\frac{\left(c^6\left(2\,x + \frac{b}{c}\right)^6 - 3\,b^2c^4\left(2\,x + \frac{b}{c}\right)^4 + 12\,ac^5\left(2\,x + \frac{b}{c}\right)^4 - 12\,c^5\left(2\,x + \frac{b}{c}\right)^4 + 3\,b^4c^2\left(2\,x + \frac{b}{c}\right)^2 - 24\,ab^2c^3\left(2\,x + \frac{b}{c}\right)^2 + \right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^3,x, algorithm="giac")
```

```
[Out] 1/64*(c^6*(2*x + b/c)^6 - 3*b^2*c^4*(2*x + b/c)^4 + 12*a*c^5*(2*x + b/c)^4
- 12*c^5*(2*x + b/c)^4 + 3*b^4*c^2*(2*x + b/c)^2 - 24*a*b^2*c^3*(2*x + b/c)
^2 + 48*a^2*c^4*(2*x + b/c)^2 + 24*b^2*c^3*(2*x + b/c)^2 - 96*a*c^4*(2*x +
b/c)^2 - b^6 + 12*a*b^4*c - 48*a^2*b^2*c^2 + 64*a^3*c^3 + 96*c^4*(2*x + b/c
)^2 - 12*b^4*c + 96*a*b^2*c^2 - 192*a^2*c^3 - 96*b^2*c^2 + 384*a*c^3 - 384*
c^3)*e^(c*x^2 + b*x + a)/c^3
```

maple [A] time = 0.03, size = 145, normalized size = 1.61

$$\left(c^3x^6 + 3b\,c^2x^5 + 3a\,c^2x^4 + 3b^2c\,x^4 + 6abc\,x^3 + b^3x^3 - 3c^2x^4 + 3a^2c\,x^2 + 3a\,b^2x^2 - 6bc\,x^3 + 3a^2bx - 6ac\,x^2 - 3b^2\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^3,x)
```

```
[Out] (c^3*x^6+3*b*c^2*x^5+3*a*c^2*x^4+3*b^2*c*x^4+6*a*b*c*x^3+b^3*x^3-3*c^2*x^4+
3*a^2*c*x^2+3*a*b^2*x^2-6*b*c*x^3+3*a^2*b*x-6*a*c*x^2-3*b^2*x^2+a^3-6*a*b*x
+6*c*x^2-3*a^2+6*b*x+6*a-6)*exp(c*x^2+b*x+a)
```

maxima [C] time = 8.25, size = 2381, normalized size = 26.46

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^3,x, algorithm="maxima")
```

```
[Out] 1/2*sqrt(pi)*a^3*b*erf(sqrt(-c)*x - 1/2*b/sqrt(-c))*e^(a - 1/4*b^2/c)/sqrt(
-c) - 3/4*(sqrt(pi)*(2*c*x + b)*b*(erf(1/2*sqrt(-(2*c*x + b)^2/c)) - 1)/(sq
rt(-(2*c*x + b)^2/c)*c^(3/2)) - 2*e^(1/4*(2*c*x + b)^2/c)/sqrt(c))*a^2*b^2*
e^(a - 1/4*b^2/c)/sqrt(c) + 3/8*(sqrt(pi)*(2*c*x + b)*b^2*(erf(1/2*sqrt(-(2
*c*x + b)^2/c)) - 1)/(sqrt(-(2*c*x + b)^2/c)*c^(5/2)) - 4*b*e^(1/4*(2*c*x +
 b)^2/c)/c^(3/2) - 4*(2*c*x + b)^3*gamma(3/2, -1/4*(2*c*x + b)^2/c)/((-(2*c
*x + b)^2/c)^(3/2)*c^(5/2)))*a*b^3*e^(a - 1/4*b^2/c)/sqrt(c) - 1/16*(sqrt(p
i)*(2*c*x + b)*b^3*(erf(1/2*sqrt(-(2*c*x + b)^2/c)) - 1)/(sqrt(-(2*c*x + b)
^2/c)*c^(7/2)) - 6*b^2*e^(1/4*(2*c*x + b)^2/c)/c^(5/2) - 12*(2*c*x + b)^3*b
*gamma(3/2, -1/4*(2*c*x + b)^2/c)/((-(2*c*x + b)^2/c)^(3/2)*c^(7/2)) + 8*ga
mma(2, -1/4*(2*c*x + b)^2/c)/c^(3/2))*b^4*e^(a - 1/4*b^2/c)/sqrt(c) - 1/2*(
sqrt(pi)*(2*c*x + b)*b*(erf(1/2*sqrt(-(2*c*x + b)^2/c)) - 1)/(sqrt(-(2*c*x
+ b)^2/c)*c^(3/2)) - 2*e^(1/4*(2*c*x + b)^2/c)/sqrt(c))*a^3*sqrt(c)*e^(a -
1/4*b^2/c) + 9/8*(sqrt(pi)*(2*c*x + b)*b^2*(erf(1/2*sqrt(-(2*c*x + b)^2/c))
 - 1)/(sqrt(-(2*c*x + b)^2/c)*c^(5/2)) - 4*b*e^(1/4*(2*c*x + b)^2/c)/c^(3/2
) - 4*(2*c*x + b)^3*gamma(3/2, -1/4*(2*c*x + b)^2/c)/((-(2*c*x + b)^2/c)^(3
/2)*c^(5/2)))*a^2*b*sqrt(c)*e^(a - 1/4*b^2/c) - 3/4*(sqrt(pi)*(2*c*x + b)*b
^3*(erf(1/2*sqrt(-(2*c*x + b)^2/c)) - 1)/(sqrt(-(2*c*x + b)^2/c)*c^(7/2)) -
 6*b^2*e^(1/4*(2*c*x + b)^2/c)/c^(5/2) - 12*(2*c*x + b)^3*b*gamma(3/2, -1/4
```

*(2*c*x + b)^2/c)/((-(2*c*x + b)^2/c)^(3/2)*c^(7/2)) + 8*gamma(2, -1/4*(2*c
*x + b)^2/c)/c^(3/2))*a*b^2*sqrt(c)*e^(a - 1/4*b^2/c) + 5/32*(sqrt(pi)*(2*c
*x + b)*b^4*(erf(1/2*sqrt(-(2*c*x + b)^2/c)) - 1)/(sqrt(-(2*c*x + b)^2/c)*c
^(9/2)) - 8*b^3*e^(1/4*(2*c*x + b)^2/c)/c^(7/2) - 24*(2*c*x + b)^3*b^2*gamm
a(3/2, -1/4*(2*c*x + b)^2/c)/((-(2*c*x + b)^2/c)^(3/2)*c^(9/2)) + 32*b*gamm
a(2, -1/4*(2*c*x + b)^2/c)/c^(5/2) - 16*(2*c*x + b)^5*gamma(5/2, -1/4*(2*c*
x + b)^2/c)/((-(2*c*x + b)^2/c)^(5/2)*c^(9/2)))*b^3*sqrt(c)*e^(a - 1/4*b^2/
c) - 3/8*(sqrt(pi)*(2*c*x + b)*b^3*(erf(1/2*sqrt(-(2*c*x + b)^2/c)) - 1)/(s
qrt(-(2*c*x + b)^2/c)*c^(7/2)) - 6*b^2*e^(1/4*(2*c*x + b)^2/c)/c^(5/2) - 12
*(2*c*x + b)^3*b*gamma(3/2, -1/4*(2*c*x + b)^2/c)/((-(2*c*x + b)^2/c)^(3/2)
*c^(7/2)) + 8*gamma(2, -1/4*(2*c*x + b)^2/c)/c^(3/2))*a^2*c^(3/2)*e^(a - 1/
4*b^2/c) + 15/32*(sqrt(pi)*(2*c*x + b)*b^4*(erf(1/2*sqrt(-(2*c*x + b)^2/c))
 - 1)/(sqrt(-(2*c*x + b)^2/c)*c^(9/2)) - 8*b^3*e^(1/4*(2*c*x + b)^2/c)/c^(7
/2) - 24*(2*c*x + b)^3*b^2*gamma(3/2, -1/4*(2*c*x + b)^2/c)/((-(2*c*x + b)^
2/c)^(3/2)*c^(9/2)) + 32*b*gamma(2, -1/4*(2*c*x + b)^2/c)/c^(5/2) - 16*(2*c
*x + b)^5*gamma(5/2, -1/4*(2*c*x + b)^2/c)/((-(2*c*x + b)^2/c)^(5/2)*c^(9/2
)))*a*b*c^(3/2)*e^(a - 1/4*b^2/c) - 9/64*(sqrt(pi)*(2*c*x + b)*b^5*(erf(1/2
*sqrt(-(2*c*x + b)^2/c)) - 1)/(sqrt(-(2*c*x + b)^2/c)*c^(11/2)) - 10*b^4*e^
(1/4*(2*c*x + b)^2/c)/c^(9/2) - 40*(2*c*x + b)^3*b^3*gamma(3/2, -1/4*(2*c*x
 + b)^2/c)/((-(2*c*x + b)^2/c)^(3/2)*c^(11/2)) + 80*b^2*gamma(2, -1/4*(2*c*
x + b)^2/c)/c^(7/2) - 80*(2*c*x + b)^5*b*gamma(5/2, -1/4*(2*c*x + b)^2/c)/(
(-(2*c*x + b)^2/c)^(5/2)*c^(11/2)) - 32*gamma(3, -1/4*(2*c*x + b)^2/c)/c^(5
/2))*b^2*c^(3/2)*e^(a - 1/4*b^2/c) - 3/32*(sqrt(pi)*(2*c*x + b)*b^5*(erf(1/
2*sqrt(-(2*c*x + b)^2/c)) - 1)/(sqrt(-(2*c*x + b)^2/c)*c^(11/2)) - 10*b^4*e
^(1/4*(2*c*x + b)^2/c)/c^(9/2) - 40*(2*c*x + b)^3*b^3*gamma(3/2, -1/4*(2*c*
x + b)^2/c)/((-(2*c*x + b)^2/c)^(3/2)*c^(11/2)) + 80*b^2*gamma(2, -1/4*(2*c
x + b)^2/c)/c^(7/2) - 80(2*c*x + b)^5*b*gamma(5/2, -1/4*(2*c*x + b)^2/c)/
((-(2*c*x + b)^2/c)^(5/2)*c^(11/2)) - 32*gamma(3, -1/4*(2*c*x + b)^2/c)/c^(
5/2))*a*c^(5/2)*e^(a - 1/4*b^2/c) + 7/128*(sqrt(pi)*(2*c*x + b)*b^6*(erf(1/
2*sqrt(-(2*c*x + b)^2/c)) - 1)/(sqrt(-(2*c*x + b)^2/c)*c^(13/2)) - 12*b^5*e
^(1/4*(2*c*x + b)^2/c)/c^(11/2) - 60*(2*c*x + b)^3*b^4*gamma(3/2, -1/4*(2*c
*x + b)^2/c)/((-(2*c*x + b)^2/c)^(3/2)*c^(13/2)) + 160*b^3*gamma(2, -1/4*(2
*c*x + b)^2/c)/c^(9/2) - 240*(2*c*x + b)^5*b^2*gamma(5/2, -1/4*(2*c*x + b)^
2/c)/((-(2*c*x + b)^2/c)^(5/2)*c^(13/2)) - 192*b*gamma(3, -1/4*(2*c*x + b)^
2/c)/c^(7/2) - 64*(2*c*x + b)^7*gamma(7/2, -1/4*(2*c*x + b)^2/c)/((-(2*c*x
 + b)^2/c)^(7/2)*c^(13/2)))*b*c^(5/2)*e^(a - 1/4*b^2/c) - 1/128*(sqrt(pi)*(2
*c*x + b)*b^7*(erf(1/2*sqrt(-(2*c*x + b)^2/c)) - 1)/(sqrt(-(2*c*x + b)^2/c)
*c^(15/2)) - 14*b^6*e^(1/4*(2*c*x + b)^2/c)/c^(13/2) - 84*(2*c*x + b)^3*b^5
gamma(3/2, -1/4(2*c*x + b)^2/c)/((-(2*c*x + b)^2/c)^(3/2)*c^(15/2)) + 280
*b^4*gamma(2, -1/4*(2*c*x + b)^2/c)/c^(11/2) - 560*(2*c*x + b)^5*b^3*gamma(
5/2, -1/4*(2*c*x + b)^2/c)/((-(2*c*x + b)^2/c)^(5/2)*c^(15/2)) - 672*b^2*ga
mma(3, -1/4*(2*c*x + b)^2/c)/c^(9/2) - 448*(2*c*x + b)^7*b*gamma(7/2, -1/4*
(2*c*x + b)^2/c)/((-(2*c*x + b)^2/c)^(7/2)*c^(15/2)) + 128*gamma(4, -1/4*(2
*c*x + b)^2/c)/c^(7/2))*c^(7/2)*e^(a - 1/4*b^2/c)

mupad [B] time = 3.79, size = 145, normalized size = 1.61

$$e^{bx}\,e^{a}\,e^{cx^2}\,\left(a^3+3\,a^2\,b\,x+3\,a^2\,c\,x^2-3\,a^2+3\,a\,b^2\,x^2+6\,a\,b\,c\,x^3-6\,a\,b\,x+3\,a\,c^2\,x^4-6\,a\,c\,x^2+6\,a+b^3\,x^3+3\,b^2\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(a + b*x + c*x^2)*(b + 2*c*x)*(a + b*x + c*x^2)^3,x)
```

```
[Out] exp(b*x)*exp(a)*exp(c*x^2)*(6*a + 6*b*x + 6*c*x^2 - 3*a^2 + a^3 - 3*b^2*x^2
 + b^3*x^3 - 3*c^2*x^4 + c^3*x^6 + 3*a*b^2*x^2 + 3*a^2*c*x^2 + 3*a*c^2*x^4
+ 3*b^2*c*x^4 + 3*b*c^2*x^5 - 6*a*b*x + 3*a^2*b*x - 6*a*c*x^2 - 6*b*c*x^3 +
 6*a*b*c*x^3 - 6)
```

sympy [A] time = 0.29, size = 160, normalized size = 1.78

$$\left(a^3+3a^2bx+3a^2cx^2-3a^2+3ab^2x^2+6abcx^3-6abx+3ac^2x^4-6acx^2+6a+b^3x^3+3b^2cx^4-3b^2x^2+3bc^2x^5\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x**2+b*x+a)*(2*c*x+b)*(c*x**2+b*x+a)**3,x)
```

```
[Out] (a**3 + 3*a**2*b*x + 3*a**2*c*x**2 - 3*a**2 + 3*a*b**2*x**2 + 6*a*b*c*x**3
- 6*a*b*x + 3*a*c**2*x**4 - 6*a*c*x**2 + 6*a + b**3*x**3 + 3*b**2*c*x**4 -
3*b**2*x**2 + 3*b*c**2*x**5 - 6*b*c*x**3 + 6*b*x + c**3*x**6 - 3*c**2*x**4
+ 6*c*x**2 - 6)*exp(a + b*x + c*x**2)
```

3.621 $\int e^{a+bx+cx^2}(b+2cx)\left(a+bx+cx^2\right)^2\,dx$

Optimal. Leaf size=64

$$e^{a+bx+cx^2}\left(a+bx+cx^2\right)^2-2e^{a+bx+cx^2}\left(a+bx+cx^2\right)+2e^{a+bx+cx^2}$$

```
[Out] 2*exp(c*x^2+b*x+a)-2*exp(c*x^2+b*x+a)*(c*x^2+b*x+a)+exp(c*x^2+b*x+a)*(c*x^2
+b*x+a)^2
```

Rubi [A] time = 0.16, antiderivative size = 64, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {6707, 2176, 2194}

$$e^{a+bx+cx^2}\left(a+bx+cx^2\right)^2-2e^{a+bx+cx^2}\left(a+bx+cx^2\right)+2e^{a+bx+cx^2}$$

Antiderivative was successfully verified.

```
[In] Int[E^(a + b*x + c*x^2)*(b + 2*c*x)*(a + b*x + c*x^2)^2,x]
```

```
[Out] 2*E^(a + b*x + c*x^2) - 2*E^(a + b*x + c*x^2)*(a + b*x + c*x^2) + E^(a + b*
x + c*x^2)*(a + b*x + c*x^2)^2
```

Rule 2176

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_.), x_Symbol] :> Simp[((c + d*x)^m*(b*F^(g*(e + f*x)))^n)/(f*g*n*Log[F]),
x] - Dist[(d*m)/(f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*(b*F^(g*(e + f*x)))^n
, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && GtQ[m, 0] && IntegerQ[2*m
] &&  !$UseGamma === True
```

Rule 2194

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 6707

```
Int[(F_)^(v_)*(u_)*(w_)^(m_.), x_Symbol] :> With[{q = DerivativeDivides[v,
u, x]}, Dist[q, Subst[Int[x^m*F^x, x], x, v], x] /;  !FalseQ[q]] /; FreeQ[{
F, m}, x] && EqQ[w, v]
```

Rubi steps

$$\int e^{a+bx+cx^2}(b+2cx)\left(a+bx+cx^2\right)^2\,dx = \text{Subst}\left(\int e^x x^2\,dx, x, a+bx+cx^2\right)$$
$$= e^{a+bx+cx^2}\left(a+bx+cx^2\right)^2 - 2\,\text{Subst}\left(\int e^x x\,dx, x, a+bx+cx^2\right)$$
$$= -2e^{a+bx+cx^2}\left(a+bx+cx^2\right) + e^{a+bx+cx^2}\left(a+bx+cx^2\right)^2 + 2\,\text{Subst}\left(\int e^x$$
$$= 2e^{a+bx+cx^2} - 2e^{a+bx+cx^2}\left(a+bx+cx^2\right) + e^{a+bx+cx^2}\left(a+bx+cx^2\right)^2$$

Mathematica [A] time = 0.03, size = 36, normalized size = 0.56

$$e^{a+x(b+cx)}\left((a+x(b+cx))^2-2(a+x(b+cx))+2\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a + b*x + c*x^2)*(b + 2*c*x)*(a + b*x + c*x^2)^2,x]
```

```
[Out] E^(a + x*(b + c*x))*(2 - 2*(a + x*(b + c*x)) + (a + x*(b + c*x))^2)
```

fricas [A] time = 0.40, size = 55, normalized size = 0.86

$$\left(c^2x^4+2\,bcx^3+2\,(a-1)bx+\left(b^2+2\,(a-1)c\right)x^2+a^2-2\,a+2\right)e^{\left(cx^2+bx+a\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^2,x, algorithm="fricas")
```

```
[Out] (c^2*x^4 + 2*b*c*x^3 + 2*(a - 1)*b*x + (b^2 + 2*(a - 1)*c)*x^2 + a^2 - 2*a
+ 2)*e^(c*x^2 + b*x + a)
```

giac [A] time = 0.23, size = 119, normalized size = 1.86

$$\frac{\left(c^4\left(2\,x+\frac{b}{c}\right)^4-2\,b^2c^2\left(2\,x+\frac{b}{c}\right)^2+8\,ac^3\left(2\,x+\frac{b}{c}\right)^2-8\,c^3\left(2\,x+\frac{b}{c}\right)^2+b^4-8\,ab^2c+16\,a^2c^2+8\,b^2c-32\,ac^2+32\,c\right.}{16\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^2,x, algorithm="giac")
```

```
[Out] 1/16*(c^4*(2*x + b/c)^4 - 2*b^2*c^2*(2*x + b/c)^2 + 8*a*c^3*(2*x + b/c)^2 -
 8*c^3*(2*x + b/c)^2 + b^4 - 8*a*b^2*c + 16*a^2*c^2 + 8*b^2*c - 32*a*c^2 +
32*c^2)*e^(c*x^2 + b*x + a)/c^2
```

maple [A] time = 0.03, size = 64, normalized size = 1.00

$$\left(c^2x^4+2bc\,x^3+2ac\,x^2+b^2x^2+2abx-2c\,x^2+a^2-2bx-2a+2\right)\mathrm{e}^{c\,x^2+bx+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^2,x)
```

```
[Out] (c^2*x^4+2*b*c*x^3+2*a*c*x^2+b^2*x^2+2*a*b*x-2*c*x^2+a^2-2*b*x-2*a+2)*exp(c
*x^2+b*x+a)
```

maxima [C] time = 5.31, size = 1223, normalized size = 19.11

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^2,x, algorithm="maxima")
```

```
[Out] 1/2*sqrt(pi)*a^2*b*erf(sqrt(-c)*x - 1/2*b/sqrt(-c))*e^(a - 1/4*b^2/c)/sqrt(
-c) - 1/2*(sqrt(pi)*(2*c*x + b)*b*(erf(1/2*sqrt(-(2*c*x + b)^2/c)) - 1)/(sq
rt(-(2*c*x + b)^2/c)*c^(3/2)) - 2*e^(1/4*(2*c*x + b)^2/c)/sqrt(c))*a*b^2*e^
(a - 1/4*b^2/c)/sqrt(c) + 1/8*(sqrt(pi)*(2*c*x + b)*b^2*(erf(1/2*sqrt(-(2*c
*x + b)^2/c)) - 1)/(sqrt(-(2*c*x + b)^2/c)*c^(5/2)) - 4*b*e^(1/4*(2*c*x + b
)^2/c)/c^(3/2) - 4*(2*c*x + b)^3*gamma(3/2, -1/4*(2*c*x + b)^2/c)/((-(2*c*x
 + b)^2/c)^(3/2)*c^(5/2)))*b^3*e^(a - 1/4*b^2/c)/sqrt(c) - 1/2*(sqrt(pi)*(2
*c*x + b)*b*(erf(1/2*sqrt(-(2*c*x + b)^2/c)) - 1)/(sqrt(-(2*c*x + b)^2/c)*c
^(3/2)) - 2*e^(1/4*(2*c*x + b)^2/c)/sqrt(c))*a^2*sqrt(c)*e^(a - 1/4*b^2/c)
+ 3/4*(sqrt(pi)*(2*c*x + b)*b^2*(erf(1/2*sqrt(-(2*c*x + b)^2/c)) - 1)/(sqrt
(-(2*c*x + b)^2/c)*c^(5/2)) - 4*b*e^(1/4*(2*c*x + b)^2/c)/c^(3/2) - 4*(2*c*
x + b)^3*gamma(3/2, -1/4*(2*c*x + b)^2/c)/((-(2*c*x + b)^2/c)^(3/2)*c^(5/2)
))*a*b*sqrt(c)*e^(a - 1/4*b^2/c) - 1/4*(sqrt(pi)*(2*c*x + b)*b^3*(erf(1/2*s
qrt(-(2*c*x + b)^2/c)) - 1)/(sqrt(-(2*c*x + b)^2/c)*c^(7/2)) - 6*b^2*e^(1/4
*(2*c*x + b)^2/c)/c^(5/2) - 12*(2*c*x + b)^3*b*gamma(3/2, -1/4*(2*c*x + b)^
2/c)/((-(2*c*x + b)^2/c)^(3/2)*c^(7/2)) + 8*gamma(2, -1/4*(2*c*x + b)^2/c)/
c^(3/2))*b^2*sqrt(c)*e^(a - 1/4*b^2/c) - 1/4*(sqrt(pi)*(2*c*x + b)*b^3*(erf
(1/2*sqrt(-(2*c*x + b)^2/c)) - 1)/(sqrt(-(2*c*x + b)^2/c)*c^(7/2)) - 6*b^2*
e^(1/4*(2*c*x + b)^2/c)/c^(5/2) - 12*(2*c*x + b)^3*b*gamma(3/2, -1/4*(2*c*x
 + b)^2/c)/((-(2*c*x + b)^2/c)^(3/2)*c^(7/2)) + 8*gamma(2, -1/4*(2*c*x + b)
^2/c)/c^(3/2))*a*c^(3/2)*e^(a - 1/4*b^2/c) + 5/32*(sqrt(pi)*(2*c*x + b)*b^4
*(erf(1/2*sqrt(-(2*c*x + b)^2/c)) - 1)/(sqrt(-(2*c*x + b)^2/c)*c^(9/2)) - 8
*b^3*e^(1/4*(2*c*x + b)^2/c)/c^(7/2) - 24*(2*c*x + b)^3*b^2*gamma(3/2, -1/4
*(2*c*x + b)^2/c)/((-(2*c*x + b)^2/c)^(3/2)*c^(9/2)) + 32*b*gamma(2, -1/4*(
2*c*x + b)^2/c)/c^(5/2) - 16*(2*c*x + b)^5*gamma(5/2, -1/4*(2*c*x + b)^2/c)
/((-(2*c*x + b)^2/c)^(5/2)*c^(9/2)))*b*c^(3/2)*e^(a - 1/4*b^2/c) - 1/32*(sq
rt(pi)*(2*c*x + b)*b^5*(erf(1/2*sqrt(-(2*c*x + b)^2/c)) - 1)/(sqrt(-(2*c*x
```

```
+ b)^2/c)*c^(11/2)) - 10*b^4*e^(1/4*(2*c*x + b)^2/c)/c^(9/2) - 40*(2*c*x +
b)^3*b^3*gamma(3/2, -1/4*(2*c*x + b)^2/c)/((-(2*c*x + b)^2/c)^(3/2)*c^(11/2
)) + 80*b^2*gamma(2, -1/4*(2*c*x + b)^2/c)/c^(7/2) - 80*(2*c*x + b)^5*b*gam
ma(5/2, -1/4*(2*c*x + b)^2/c)/((-(2*c*x + b)^2/c)^(5/2)*c^(11/2)) - 32*gamm
a(3, -1/4*(2*c*x + b)^2/c)/c^(5/2))*c^(5/2)*e^(a - 1/4*b^2/c)
```

mupad [B] time = 3.61, size = 64, normalized size = 1.00

$$e^{b\,x}\,e^{a}\,e^{c\,x^2}\,\left(a^2+2\,a\,b\,x+2\,a\,c\,x^2-2\,a+b^2\,x^2+2\,b\,c\,x^3-2\,b\,x+c^2\,x^4-2\,c\,x^2+2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(a + b*x + c*x^2)*(b + 2*c*x)*(a + b*x + c*x^2)^2,x)
```

```
[Out] exp(b*x)*exp(a)*exp(c*x^2)*(a^2 - 2*b*x - 2*c*x^2 - 2*a + b^2*x^2 + c^2*x^4
 + 2*a*b*x + 2*a*c*x^2 + 2*b*c*x^3 + 2)
```

sympy [A] time = 0.20, size = 68, normalized size = 1.06

$$\left(a^{2} + 2abx + 2acx^{2} - 2a + b^{2}x^{2} + 2bcx^{3} - 2bx + c^{2}x^{4} - 2cx^{2} + 2\right)e^{a + bx + cx^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x**2+b*x+a)*(2*c*x+b)*(c*x**2+b*x+a)**2,x)
```

```
[Out] (a**2 + 2*a*b*x + 2*a*c*x**2 - 2*a + b**2*x**2 + 2*b*c*x**3 - 2*b*x + c**2*
x**4 - 2*c*x**2 + 2)*exp(a + b*x + c*x**2)
```

3.622 $\int e^{a+bx+cx^2}(b+2cx)\left(a+bx+cx^2\right) dx$

Optimal. Leaf size=38

$$e^{a+bx+cx^2}\left(a+bx+cx^2\right)-e^{a+bx+cx^2}$$

```
[Out] -exp(c*x^2+b*x+a)+exp(c*x^2+b*x+a)*(c*x^2+b*x+a)
```

Rubi [A] time = 0.10, antiderivative size = 38, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.103, Rules used = {6707, 2176, 2194}

$$e^{a+bx+cx^2}\left(a+bx+cx^2\right)-e^{a+bx+cx^2}$$

Antiderivative was successfully verified.

```
[In] Int[E^(a + b*x + c*x^2)*(b + 2*c*x)*(a + b*x + c*x^2),x]
```

```
[Out] -E^(a + b*x + c*x^2) + E^(a + b*x + c*x^2)*(a + b*x + c*x^2)
```

Rule 2176

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_.), x_Symbol] :> Simp[((c + d*x)^m*(b*F^(g*(e + f*x)))^n)/(f*g*n*Log[F]),
x] - Dist[(d*m)/(f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*(b*F^(g*(e + f*x)))^n
, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && GtQ[m, 0] && IntegerQ[2*m
] &&  !$UseGamma === True
```

Rule 2194

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 6707

```
Int[(F_)^(v_)*(u_)*(w_)^(m_.), x_Symbol] :> With[{q = DerivativeDivides[v,
u, x]}, Dist[q, Subst[Int[x^m*F^x, x], x, v], x] /;  !FalseQ[q]] /; FreeQ[{
F, m}, x] && EqQ[w, v]
```

Rubi steps

$$\int e^{a+bx+cx^2}(b+2cx)\left(a+bx+cx^2\right)\,dx = \text{Subst}\left(\int e^x x\,dx, x, a+bx+cx^2\right)$$
$$= e^{a+bx+cx^2}\left(a+bx+cx^2\right) - \text{Subst}\left(\int e^x\,dx, x, a+bx+cx^2\right)$$
$$= -e^{a+bx+cx^2} + e^{a+bx+cx^2}\left(a+bx+cx^2\right)$$

Mathematica [**A**] time = 0.03, size = 23, normalized size = 0.61

$$e^{a+x(b+cx)}\left(a+bx+cx^2-1\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a + b*x + c*x^2)*(b + 2*c*x)*(a + b*x + c*x^2),x]
[Out] E^(a + x*(b + c*x))*(-1 + a + b*x + c*x^2)
```

fricas [**A**] time = 0.40, size = 23, normalized size = 0.61

$$\left(cx^2+bx+a-1\right)e^{\left(cx^2+bx+a\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a),x, algorithm="fricas")
[Out] (c*x^2 + b*x + a - 1)*e^(c*x^2 + b*x + a)
```

giac [**A**] time = 0.23, size = 44, normalized size = 1.16

$$\frac{\left(c^2\left(2\,x+\frac{b}{c}\right)^2-b^2+4\,ac-4\,c\right)e^{\left(cx^2+bx+a\right)}}{4\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a),x, algorithm="giac")
[Out] 1/4*(c^2*(2*x + b/c)^2 - b^2 + 4*a*c - 4*c)*e^(c*x^2 + b*x + a)/c
```

maple [**A**] time = 0.02, size = 24, normalized size = 0.63

$$\left(c\,x^2+bx+a-1\right)\mathrm{e}^{c\,x^2+bx+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a),x)
```

```
[Out] (c*x^2+b*x+a-1)*exp(c*x^2+b*x+a)
```

maxima [C] time = 2.96, size = 501, normalized size = 13.18

$$\frac{\sqrt{\pi}\,ab\,\mathrm{erf}\left(\sqrt{-c}\,x-\frac{b}{2\sqrt{-c}}\right)e^{\left(a-\frac{b^2}{4c}\right)}}{2\sqrt{-c}}-\frac{\left(\frac{\sqrt{\pi}\,(2\,cx+b)b\left(\mathrm{erf}\left(\frac{1}{2}\sqrt{-\frac{(2\,cx+b)^2}{c}}\right)-1\right)}{\sqrt{-\frac{(2\,cx+b)^2}{c}}\,c^{\frac{3}{2}}}-\frac{2\,e^{\left(\frac{(2\,cx+b)^2}{4\,c}\right)}}{\sqrt{c}}\right)b^2e^{\left(a-\frac{b^2}{4\,c}\right)}}{4\sqrt{c}}-\frac{1}{2}\left(\frac{\sqrt{\pi}\,(2\,cx+b)b\left(\mathrm{er}\right.}{\sqrt{-\frac{(}{}}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a),x, algorithm="maxima")
```

```
[Out] 1/2*sqrt(pi)*a*b*erf(sqrt(-c)*x - 1/2*b/sqrt(-c))*e^(a - 1/4*b^2/c)/sqrt(-c
) - 1/4*(sqrt(pi)*(2*c*x + b)*b*(erf(1/2*sqrt(-(2*c*x + b)^2/c)) - 1)/(sqrt
(-(2*c*x + b)^2/c)*c^(3/2)) - 2*e^(1/4*(2*c*x + b)^2/c)/sqrt(c))*b^2*e^(a -
 1/4*b^2/c)/sqrt(c) - 1/2*(sqrt(pi)*(2*c*x + b)*b*(erf(1/2*sqrt(-(2*c*x + b
)^2/c)) - 1)/(sqrt(-(2*c*x + b)^2/c)*c^(3/2)) - 2*e^(1/4*(2*c*x + b)^2/c)/s
qrt(c))*a*sqrt(c)*e^(a - 1/4*b^2/c) + 3/8*(sqrt(pi)*(2*c*x + b)*b^2*(erf(1/
2*sqrt(-(2*c*x + b)^2/c)) - 1)/(sqrt(-(2*c*x + b)^2/c)*c^(5/2)) - 4*b*e^(1/
4*(2*c*x + b)^2/c)/c^(3/2) - 4*(2*c*x + b)^3*gamma(3/2, -1/4*(2*c*x + b)^2/
c)/((-(2*c*x + b)^2/c)^(3/2)*c^(5/2)))*b*sqrt(c)*e^(a - 1/4*b^2/c) - 1/8*(s
qrt(pi)*(2*c*x + b)*b^3*(erf(1/2*sqrt(-(2*c*x + b)^2/c)) - 1)/(sqrt(-(2*c*x
 + b)^2/c)*c^(7/2)) - 6*b^2*e^(1/4*(2*c*x + b)^2/c)/c^(5/2) - 12*(2*c*x + b
)^3*b*gamma(3/2, -1/4*(2*c*x + b)^2/c)/((-(2*c*x + b)^2/c)^(3/2)*c^(7/2)) +
 8*gamma(2, -1/4*(2*c*x + b)^2/c)/c^(3/2))*c^(3/2)*e^(a - 1/4*b^2/c)
```

mupad [B] time = 0.10, size = 23, normalized size = 0.61

$$\mathrm{e}^{c\,x^2+b\,x+a}\,\left(c\,x^2+b\,x+a-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(a + b*x + c*x^2)*(b + 2*c*x)*(a + b*x + c*x^2),x)
```

```
[Out] exp(a + b*x + c*x^2)*(a + b*x + c*x^2 - 1)
```

sympy [A] time = 0.15, size = 22, normalized size = 0.58

$$\left(a+bx+cx^2-1\right)e^{a+bx+cx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x**2+b*x+a)*(2*c*x+b)*(c*x**2+b*x+a),x)
[Out] (a + b*x + c*x**2 - 1)*exp(a + b*x + c*x**2)
```

3.623 $\int e^{a+bx+cx^2}(b+2cx)\,dx$

Optimal. Leaf size=12

$$e^{a+bx+cx^2}$$

```
[Out] exp(c*x^2+b*x+a)
```

Rubi [A] time = 0.02, antiderivative size = 12, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.053, Rules used = {2236}

$$e^{a+bx+cx^2}$$

Antiderivative was successfully verified.

```
[In] Int[E^(a + b*x + c*x^2)*(b + 2*c*x),x]
```

```
[Out] E^(a + b*x + c*x^2)
```

Rule 2236

```
Int[(F_)^((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_.) + (e_.)*(x_)), x_Symbol
] :> Simp[(e*F^(a + b*x + c*x^2))/(2*c*Log[F]), x] /; FreeQ[{F, a, b, c, d,
 e}, x] && EqQ[b*e - 2*c*d, 0]
```

Rubi steps

$$\int e^{a+bx+cx^2}(b+2cx)\,dx = e^{a+bx+cx^2}$$

Mathematica [A] time = 0.04, size = 12, normalized size = 1.00

$$e^{a+bx+cx^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a + b*x + c*x^2)*(b + 2*c*x),x]
```

```
[Out] E^(a + b*x + c*x^2)
```

fricas [A] time = 0.40, size = 11, normalized size = 0.92

$$e^{\left(cx^2+bx+a\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b),x, algorithm="fricas")
```

```
[Out] e^(c*x^2 + b*x + a)
```

giac [A] time = 0.21, size = 11, normalized size = 0.92

$$e^{\left(cx^2+bx+a\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b),x, algorithm="giac")
```

```
[Out] e^(c*x^2 + b*x + a)
```

maple [A] time = 0.03, size = 12, normalized size = 1.00

$$e^{c\,x^2+bx+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(c*x^2+b*x+a)*(2*c*x+b),x)
```

```
[Out] exp(c*x^2+b*x+a)
```

maxima [A] time = 1.27, size = 11, normalized size = 0.92

$$e^{\left(cx^2+bx+a\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b),x, algorithm="maxima")
```

```
[Out] e^(c*x^2 + b*x + a)
```

mupad [B] time = 0.08, size = 13, normalized size = 1.08

$$e^{b\,x}\,e^{a}\,e^{c\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(a + b*x + c*x^2)*(b + 2*c*x),x)
```

```
[Out] exp(b*x)*exp(a)*exp(c*x^2)
```

sympy [A] time = 0.11, size = 10, normalized size = 0.83

$$e^{a+bx+cx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x**2+b*x+a)*(2*c*x+b),x)
```

```
[Out] exp(a + b*x + c*x**2)
```

3.624 $\int \frac{e^{a+bx+cx^2}(b+2cx)}{a+bx+cx^2}\,dx$

Optimal. Leaf size=11

$$\text{Ei}\left(a+bx+cx^2\right)$$

```
[Out] Ei(c*x^2+b*x+a)
```

Rubi [A] time = 0.18, antiderivative size = 11, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.065, Rules used = {6707, 2178}

$$\text{Ei}\left(a+bx+cx^2\right)$$

Antiderivative was successfully verified.

```
[In] Int[(E^(a + b*x + c*x^2)*(b + 2*c*x))/(a + b*x + c*x^2),x]
```

```
[Out] ExpIntegralEi[a + b*x + c*x^2]
```

Rule 2178

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - (c*f)/d))*ExpIntegralEi[(f*g*(c + d*x)*Log[F])/d])/d, x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 6707

```
Int[(F_)^(v_)*(u_)*(w_)^(m_.), x_Symbol] :> With[{q = DerivativeDivides[v,
u, x]}, Dist[q, Subst[Int[x^m*F^x, x], x, v], x] /;  !FalseQ[q]] /; FreeQ[{
F, m}, x] && EqQ[w, v]
```

Rubi steps

$$\begin{aligned} \int \frac{e^{a+bx+cx^2}(b+2cx)}{a+bx+cx^2}\,dx &= \text{Subst}\left(\int \frac{e^x}{x}\,dx, x, a+bx+cx^2\right)\\ &= \text{Ei}\left(a+bx+cx^2\right) \end{aligned}$$

Mathematica [A] time = 0.02, size = 10, normalized size = 0.91

$$\text{Ei}(a+x(b+cx))$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^(a + b*x + c*x^2)*(b + 2*c*x))/(a + b*x + c*x^2),x]
[Out] ExpIntegralEi[a + x*(b + c*x)]
```

fricas [A] time = 0.40, size = 11, normalized size = 1.00

$$\mathrm{Ei}\left(cx^2 + bx + a\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a),x, algorithm="fricas")
[Out] Ei(c*x^2 + b*x + a)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(2\,cx + b)e^{\left(cx^2 + bx + a\right)}}{cx^2 + bx + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a),x, algorithm="giac")
[Out] integrate((2*c*x + b)*e^(c*x^2 + b*x + a)/(c*x^2 + b*x + a), x)
```

maple [A] time = 0.03, size = 19, normalized size = 1.73

$$-\mathrm{Ei}\left(1, -c\,x^2 - bx - a\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a),x)
[Out] -Ei(1,-c*x^2-b*x-a)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(2\,cx + b)e^{\left(cx^2 + bx + a\right)}}{cx^2 + bx + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a),x, algorithm="maxima")
[Out] integrate((2*c*x + b)*e^(c*x^2 + b*x + a)/(c*x^2 + b*x + a), x)
```

mupad [B] time = 3.79, size = 11, normalized size = 1.00

$$\mathrm{ei}\left(c\,x^2+b\,x+a\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(a + b*x + c*x^2)*(b + 2*c*x))/(a + b*x + c*x^2),x)
```

```
[Out] ei(a + b*x + c*x^2)
```

sympy [A] time = 21.02, size = 10, normalized size = 0.91

$$\mathrm{Ei}\left(a+bx+cx^2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x**2+b*x+a)*(2*c*x+b)/(c*x**2+b*x+a),x)
```

```
[Out] Ei(a + b*x + c*x**2)
```

3.625 $\int \frac{e^{a+bx+cx^2}(b+2cx)}{(a+bx+cx^2)^2} dx$

Optimal. Leaf size=38

$$\text{Ei}\left(cx^2+bx+a\right)-\frac{e^{a+bx+cx^2}}{a+bx+cx^2}$$

[Out] -exp(c*x^2+b*x+a)/(c*x^2+b*x+a)+Ei(c*x^2+b*x+a)

Rubi [A] time = 0.20, antiderivative size = 38, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {6707, 2177, 2178}

$$\text{Ei}\left(cx^2+bx+a\right)-\frac{e^{a+bx+cx^2}}{a+bx+cx^2}$$

Antiderivative was successfully verified.

[In] Int[(E^(a + b*x + c*x^2)*(b + 2*c*x))/(a + b*x + c*x^2)^2,x]

[Out] -(E^(a + b*x + c*x^2)/(a + b*x + c*x^2)) + ExpIntegralEi[a + b*x + c*x^2]

Rule 2177

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_), x_Symbol] :> Simp[((c + d*x)^(m + 1)*(b*F^(g*(e + f*x)))^n)/(d*(m + 1))
, x] - Dist[(f*g*n*Log[F])/(d*(m + 1)), Int[(c + d*x)^(m + 1)*(b*F^(g*(e +
f*x)))^n, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && LtQ[m, -1] && Int
egerQ[2*m] &&  !$UseGamma === True
```

Rule 2178

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - (c*f)/d))*ExpIntegralEi[(f*g*(c + d*x)*Log[F])/d])/d, x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 6707

```
Int[(F_)^(v_)*(u_)*(w_)^(m_.), x_Symbol] :> With[{q = DerivativeDivides[v,
u, x]}, Dist[q, Subst[Int[x^m*F^x, x], x, v], x] /;  !FalseQ[q]] /; FreeQ[{
F, m}, x] && EqQ[w, v]
```

Rubi steps

$$\int \frac{e^{a+bx+cx^2}(b+2cx)}{\left(a+bx+cx^2\right)^2}\,dx = \text{Subst}\left(\int \frac{e^x}{x^2}\,dx, x, a+bx+cx^2\right)$$
$$= -\frac{e^{a+bx+cx^2}}{a+bx+cx^2} + \text{Subst}\left(\int \frac{e^x}{x}\,dx, x, a+bx+cx^2\right)$$
$$= -\frac{e^{a+bx+cx^2}}{a+bx+cx^2} + \text{Ei}\left(a+bx+cx^2\right)$$

Mathematica [A] time = 0.05, size = 35, normalized size = 0.92

$$\text{Ei}(a+x(b+cx)) - \frac{e^{a+x(b+cx)}}{a+x(b+cx)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^(a + b*x + c*x^2)*(b + 2*c*x))/(a + b*x + c*x^2)^2,x]
[Out] -(E^(a + x*(b + c*x))/(a + x*(b + c*x))) + ExpIntegralEi[a + x*(b + c*x)]
```

fricas [A] time = 0.39, size = 49, normalized size = 1.29

$$\frac{\left(cx^2+bx+a\right)\text{Ei}\left(cx^2+bx+a\right) - e^{\left(cx^2+bx+a\right)}}{cx^2+bx+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^2,x, algorithm="fricas")
[Out] ((c*x^2 + b*x + a)*Ei(c*x^2 + b*x + a) - e^(c*x^2 + b*x + a))/(c*x^2 + b*x
+ a)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(2\,cx+b)e^{\left(cx^2+bx+a\right)}}{\left(cx^2+bx+a\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^2,x, algorithm="giac")
[Out] integrate((2*c*x + b)*e^(c*x^2 + b*x + a)/(c*x^2 + b*x + a)^2, x)
```

maple [A] time = 0.03, size = 45, normalized size = 1.18

$$-\operatorname{Ei}\left(1,-c\,x^2-bx-a\right)-\frac{\mathrm{e}^{c\,x^2+bx+a}}{c\,x^2+bx+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^2,x)
[Out] -exp(c*x^2+b*x+a)/(c*x^2+b*x+a)-Ei(1,-c*x^2-b*x-a)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(2\,cx+b)e^{\left(cx^2+bx+a\right)}}{\left(cx^2+bx+a\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^2,x, algorithm="maxima")
[Out] integrate((2*c*x + b)*e^(c*x^2 + b*x + a)/(c*x^2 + b*x + a)^2, x)
```

mupad [B] time = 3.99, size = 44, normalized size = 1.16

$$-\mathrm{expint}\left(-c\,x^2-b\,x-a\right)-\frac{\mathrm{e}^{b\,x}\,\mathrm{e}^{a}\,\mathrm{e}^{c\,x^2}}{c\,x^2+b\,x+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(a + b*x + c*x^2)*(b + 2*c*x))/(a + b*x + c*x^2)^2,x)
[Out] - expint(- a - b*x - c*x^2) - (exp(b*x)*exp(a)*exp(c*x^2))/(a + b*x + c*x^2
)
```

sympy [A] time = 159.33, size = 24, normalized size = 0.63

$$-\frac{\mathrm{E}_2\left(-a-bx-cx^2\right)}{a+bx+cx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x**2+b*x+a)*(2*c*x+b)/(c*x**2+b*x+a)**2,x)
[Out] -expint(2, -a - b*x - c*x**2)/(a + b*x + c*x**2)
```

3.626 $\int \frac{e^{a+bx+cx^2}(b+2cx)}{\left(a+bx+cx^2\right)^3} dx$

Optimal. Leaf size=72

$$\frac{1}{2}\text{Ei}\left(cx^2+bx+a\right)-\frac{e^{a+bx+cx^2}}{2\left(a+bx+cx^2\right)}-\frac{e^{a+bx+cx^2}}{2\left(a+bx+cx^2\right)^2}$$

```
[Out] -1/2*exp(c*x^2+b*x+a)/(c*x^2+b*x+a)^2-1/2*exp(c*x^2+b*x+a)/(c*x^2+b*x+a)+1/
2*Ei(c*x^2+b*x+a)
```

Rubi [A] time = 0.24, antiderivative size = 72, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {6707, 2177, 2178}

$$\frac{1}{2}\text{Ei}\left(cx^2+bx+a\right)-\frac{e^{a+bx+cx^2}}{2\left(a+bx+cx^2\right)}-\frac{e^{a+bx+cx^2}}{2\left(a+bx+cx^2\right)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(E^(a + b*x + c*x^2)*(b + 2*c*x))/(a + b*x + c*x^2)^3,x]
```

```
[Out] -E^(a + b*x + c*x^2)/(2*(a + b*x + c*x^2)^2) - E^(a + b*x + c*x^2)/(2*(a +
b*x + c*x^2)) + ExpIntegralEi[a + b*x + c*x^2]/2
```

Rule 2177

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_), x_Symbol] :> Simp[((c + d*x)^(m + 1)*(b*F^(g*(e + f*x)))^n)/(d*(m + 1))
, x] - Dist[(f*g*n*Log[F])/(d*(m + 1)), Int[(c + d*x)^(m + 1)*(b*F^(g*(e +
f*x)))^n, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && LtQ[m, -1] && Int
egerQ[2*m] &&  !$UseGamma === True
```

Rule 2178

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - (c*f)/d))*ExpIntegralEi[(f*g*(c + d*x)*Log[F])/d])/d, x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 6707

```
Int[(F_)^(v_)*(u_)*(w_)^(m_.), x_Symbol] :> With[{q = DerivativeDivides[v,
u, x]}, Dist[q, Subst[Int[x^m*F^x, x], x, v], x] /;  !FalseQ[q]] /; FreeQ[{
```

```
F, m}, x] && EqQ[w, v]
```

Rubi steps

$$\int \frac{e^{a+bx+cx^2}(b+2cx)}{\left(a+bx+cx^2\right)^3}\,dx = \text{Subst}\left(\int \frac{e^x}{x^3}\,dx, x, a+bx+cx^2\right)$$
$$= -\frac{e^{a+bx+cx^2}}{2\left(a+bx+cx^2\right)^2} + \frac{1}{2}\text{Subst}\left(\int \frac{e^x}{x^2}\,dx, x, a+bx+cx^2\right)$$
$$= -\frac{e^{a+bx+cx^2}}{2\left(a+bx+cx^2\right)^2} - \frac{e^{a+bx+cx^2}}{2\left(a+bx+cx^2\right)} + \frac{1}{2}\text{Subst}\left(\int \frac{e^x}{x}\,dx, x, a+bx+cx^2\right)$$
$$= -\frac{e^{a+bx+cx^2}}{2\left(a+bx+cx^2\right)^2} - \frac{e^{a+bx+cx^2}}{2\left(a+bx+cx^2\right)} + \frac{1}{2}\text{Ei}\left(a+bx+cx^2\right)$$

Mathematica [A] time = 0.07, size = 50, normalized size = 0.69

$$\frac{1}{2}\left(\text{Ei}(a+x(b+cx)) - \frac{e^{a+x(b+cx)}\left(a+bx+cx^2+1\right)}{(a+x(b+cx))^2}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^(a + b*x + c*x^2)*(b + 2*c*x))/(a + b*x + c*x^2)^3,x]
```

```
[Out] (-((E^(a + x*(b + c*x))*(1 + a + b*x + c*x^2))/(a + x*(b + c*x))^2) + ExpIn
tegralEi[a + x*(b + c*x)])/2
```

fricas [A] time = 0.40, size = 111, normalized size = 1.54

$$\frac{\left(c^2x^4 + 2\,bcx^3 + 2\,abx + \left(b^2 + 2\,ac\right)x^2 + a^2\right)\text{Ei}\left(cx^2 + bx + a\right) - \left(cx^2 + bx + a + 1\right)e^{\left(cx^2+bx+a\right)}}{2\left(c^2x^4 + 2\,bcx^3 + 2\,abx + \left(b^2 + 2\,ac\right)x^2 + a^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^3,x, algorithm="fricas")
```

```
[Out] 1/2*((c^2*x^4 + 2*b*c*x^3 + 2*a*b*x + (b^2 + 2*a*c)*x^2 + a^2)*Ei(c*x^2 + b
*x + a) - (c*x^2 + b*x + a + 1)*e^(c*x^2 + b*x + a))/(c^2*x^4 + 2*b*c*x^3 +
 2*a*b*x + (b^2 + 2*a*c)*x^2 + a^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(2\,cx+b)e^{\left(cx^2+bx+a\right)}}{\left(cx^2+bx+a\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^3,x, algorithm="giac")
```

```
[Out] integrate((2*c*x + b)*e^(c*x^2 + b*x + a)/(c*x^2 + b*x + a)^3, x)
```

maple [A] time = 0.03, size = 70, normalized size = 0.97

$$-\frac{\mathrm{Ei}\left(1,-c\,x^2-bx-a\right)}{2}-\frac{\mathrm{e}^{c\,x^2+bx+a}}{2\left(c\,x^2+bx+a\right)^2}-\frac{\mathrm{e}^{c\,x^2+bx+a}}{2\left(c\,x^2+bx+a\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^3,x)
```

```
[Out] -1/2*exp(c*x^2+b*x+a)/(c*x^2+b*x+a)^2-1/2/(c*x^2+b*x+a)*exp(c*x^2+b*x+a)-1/
2*Ei(1,-c*x^2-b*x-a)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(2\,cx+b)e^{\left(cx^2+bx+a\right)}}{\left(cx^2+bx+a\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^3,x, algorithm="maxima")
```

```
[Out] integrate((2*c*x + b)*e^(c*x^2 + b*x + a)/(c*x^2 + b*x + a)^3, x)
```

mupad [B] time = 4.04, size = 62, normalized size = 0.86

$$-\frac{\mathrm{expint}\left(-c\,x^2-b\,x-a\right)}{2}-\mathrm{e}^{c\,x^2+b\,x+a}\,\left(\frac{1}{2\,\left(c\,x^2+b\,x+a\right)}+\frac{1}{2\,\left(c\,x^2+b\,x+a\right)^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(a + b*x + c*x^2)*(b + 2*c*x))/(a + b*x + c*x^2)^3,x)
```

```
[Out] - expint(- a - b*x - c*x^2)/2 - exp(a + b*x + c*x^2)*(1/(2*(a + b*x + c*x^2
)) + 1/(2*(a + b*x + c*x^2)^2))
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x**2+b*x+a)*(2*c*x+b)/(c*x**2+b*x+a)**3,x)
```

```
[Out] Timed out
```

3.627 $\int e^{a+bx+cx^2}(b+2cx)\left(a+bx+cx^2\right)^{7/2}\,dx$

Optimal. Leaf size=142

$$\frac{105}{16}\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{a+bx+cx^2}\right)+e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{7/2}-\frac{7}{2}e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{5/2}+\frac{35}{4}e^{a+bx+cx^2}\left(a+bx+cx^2\right.$$

```
[Out] 35/4*exp(c*x^2+b*x+a)*(c*x^2+b*x+a)^(3/2)-7/2*exp(c*x^2+b*x+a)*(c*x^2+b*x+a
)^(5/2)+exp(c*x^2+b*x+a)*(c*x^2+b*x+a)^(7/2)+105/16*erfi((c*x^2+b*x+a)^(1/2
))*Pi^(1/2)-105/8*exp(c*x^2+b*x+a)*(c*x^2+b*x+a)^(1/2)
```

Rubi [A] time = 0.63, antiderivative size = 142, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 4, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.121, Rules used = {6707, 2176, 2180, 2204}

$$\frac{105}{16}\sqrt{\pi}\,\mathrm{Erfi}\left(\sqrt{a+bx+cx^2}\right)+e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{7/2}-\frac{7}{2}e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{5/2}+\frac{35}{4}e^{a+bx+cx^2}\left(a+bx+cx^2\right.$$

Antiderivative was successfully verified.

```
[In] Int[E^(a + b*x + c*x^2)*(b + 2*c*x)*(a + b*x + c*x^2)^(7/2),x]
```

```
[Out] (-105*E^(a + b*x + c*x^2)*Sqrt[a + b*x + c*x^2])/8 + (35*E^(a + b*x + c*x^2
)*(a + b*x + c*x^2)^(3/2))/4 - (7*E^(a + b*x + c*x^2)*(a + b*x + c*x^2)^(5/
2))/2 + E^(a + b*x + c*x^2)*(a + b*x + c*x^2)^(7/2) + (105*Sqrt[Pi]*Erfi[Sq
rt[a + b*x + c*x^2]])/16
```

Rule 2176

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_.), x_Symbol] :> Simp[((c + d*x)^m*(b*F^(g*(e + f*x)))^n)/(f*g*n*Log[F]),
x] - Dist[(d*m)/(f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*(b*F^(g*(e + f*x)))^n
, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && GtQ[m, 0] && IntegerQ[2*m
] &&  !$UseGamma === True
```

Rule 2180

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :
> Dist[2/d, Subst[Int[F^(g*(e - (c*f)/d) + (f*g*x^2)/d), x], x, Sqrt[c + d*
x]], x] /; FreeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
```

```
F, a, b, c, d}, x] && PosQ[b]
```

Rule 6707

```
Int[(F_)^(v_)*(u_)*(w_)^(m_.), x_Symbol] :> With[{q = DerivativeDivides[v,
u, x]}, Dist[q, Subst[Int[x^m*F^x, x], x, v], x] /;  !FalseQ[q]] /; FreeQ[{
F, m}, x] && EqQ[w, v]
```

Rubi steps

$$\begin{aligned}
\int e^{a+bx+cx^2}(b+2cx)\left(a+bx+cx^2\right)^{7/2}\,dx &= \text{Subst}\left(\int e^x x^{7/2}\,dx, x, a+bx+cx^2\right)\\
&= e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{7/2}-\frac{7}{2}\text{Subst}\left(\int e^x x^{5/2}\,dx, x, a+bx+cx^2\right)\\
&= -\frac{7}{2}e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{5/2}+e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{7/2}+\frac{35}{4}\text{Sul}\\
&= \frac{35}{4}e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{3/2}-\frac{7}{2}e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{5/2}+e^{a+bx\cdot}\\
&= -\frac{105}{8}e^{a+bx+cx^2}\sqrt{a+bx+cx^2}+\frac{35}{4}e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{3/2}-\frac{7}{2}e^{a\cdot}\\
&= -\frac{105}{8}e^{a+bx+cx^2}\sqrt{a+bx+cx^2}+\frac{35}{4}e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{3/2}-\frac{7}{2}e^{a\cdot}\\
&= -\frac{105}{8}e^{a+bx+cx^2}\sqrt{a+bx+cx^2}+\frac{35}{4}e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{3/2}-\frac{7}{2}e^{a\cdot}
\end{aligned}$$

Mathematica [A] time = 0.20, size = 47, normalized size = 0.33

$$-\frac{\sqrt{a+x(b+cx)}\,\Gamma\left(\frac{9}{2},-a-x(b+cx)\right)}{\sqrt{-a-x(b+cx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a + b*x + c*x^2)*(b + 2*c*x)*(a + b*x + c*x^2)^(7/2),x]
[Out] -((Sqrt[a + x*(b + c*x)]*Gamma[9/2, -a - x*(b + c*x)])/Sqrt[-a - x*(b + c*x
)])
```

fricas [F] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(2\,c^4x^7+7\,bc^3x^6+3\left(3\,b^2c^2+2\,ac^3\right)x^5+5\left(b^3c+3\,abc^2\right)x^4+a^3b+\left(b^4+12\,ab^2c+6\,a^2c^2\right)x^3+3\left(ab\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^(7/2),x, algorithm="fric
as")
```

```
[Out] integral((2*c^4*x^7 + 7*b*c^3*x^6 + 3*(3*b^2*c^2 + 2*a*c^3)*x^5 + 5*(b^3*c
+ 3*a*b*c^2)*x^4 + a^3*b + (b^4 + 12*a*b^2*c + 6*a^2*c^2)*x^3 + 3*(a*b^3 +
3*a^2*b*c)*x^2 + (3*a^2*b^2 + 2*a^3*c)*x)*sqrt(c*x^2 + b*x + a)*e^(c*x^2 +
b*x + a), x)
```

giac [A] time = 0.46, size = 93, normalized size = 0.65

$$\frac{105}{16}\sqrt{\pi}\,i\,\mathrm{erf}\left(-\sqrt{cx^2+bx+a}\,i\right)+\frac{1}{8}\left(8\left(cx^2+bx+a\right)^{\frac{7}{2}}-28\left(cx^2+bx+a\right)^{\frac{5}{2}}+70\left(cx^2+bx+a\right)^{\frac{3}{2}}-105\sqrt{cx^2+b}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^(7/2),x, algorithm="giac
")
```

```
[Out] 105/16*sqrt(pi)*i*erf(-sqrt(c*x^2 + b*x + a)*i) + 1/8*(8*(c*x^2 + b*x + a)^
(7/2) - 28*(c*x^2 + b*x + a)^(5/2) + 70*(c*x^2 + b*x + a)^(3/2) - 105*sqrt(
c*x^2 + b*x + a))*e^(c*x^2 + b*x + a)
```

maple [A] time = 0.04, size = 119, normalized size = 0.84

$$\frac{105\sqrt{\pi}\ \mathrm{erfi}\left(\sqrt{c\,x^2+bx+a}\right)}{16}+\frac{35\left(c\,x^2+bx+a\right)^{\frac{3}{2}}\mathrm{e}^{c\,x^2+bx+a}}{4}-\frac{7\left(c\,x^2+bx+a\right)^{\frac{5}{2}}\mathrm{e}^{c\,x^2+bx+a}}{2}+\left(c\,x^2+bx+a\right)^{\frac{7}{2}}\mathrm{e}^{c\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^(7/2),x)
```

```
[Out] 35/4*exp(c*x^2+b*x+a)*(c*x^2+b*x+a)^(3/2)-7/2*exp(c*x^2+b*x+a)*(c*x^2+b*x+a
)^(5/2)+exp(c*x^2+b*x+a)*(c*x^2+b*x+a)^(7/2)+105/16*erfi((c*x^2+b*x+a)^(1/2
))*Pi^(1/2)-105/8*exp(c*x^2+b*x+a)*(c*x^2+b*x+a)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\left(cx^2+bx+a\right)^{\frac{7}{2}}(2\,cx+b)e^{\left(cx^2+bx+a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^(7/2),x, algorithm="maxi
ma")
```

[Out] integrate((c*x^2 + b*x + a)^(7/2)*(2*c*x + b)*e^(c*x^2 + b*x + a), x)

mupad [B] time = 4.22, size = 135, normalized size = 0.95

$$\frac{\left(e^{c\,x^2+b\,x+a}\,\left(\frac{105\,\sqrt{-c\,x^2-b\,x-a}}{8}+\frac{35\,{\left(-c\,x^2-b\,x-a\right)}^{3/2}}{4}+\frac{7\,{\left(-c\,x^2-b\,x-a\right)}^{5/2}}{2}+{\left(-c\,x^2-b\,x-a\right)}^{7/2}\right)+\frac{105\,\sqrt{\pi }\,\mathrm{erfc}\left(\sqrt{-c\,x^2-b\,x-a}\right)}{16}\right)}{{\left(-c\,x^2-b\,x-a\right)}^{7/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(exp(a + b*x + c*x^2)*(b + 2*c*x)*(a + b*x + c*x^2)^(7/2),x)

[Out] ((exp(a + b*x + c*x^2)*((105*(- a - b*x - c*x^2)^(1/2))/8 + (35*(- a - b*x - c*x^2)^(3/2))/4 + (7*(- a - b*x - c*x^2)^(5/2))/2 + (- a - b*x - c*x^2)^(7/2)) + (105*pi^(1/2)*erfc((- a - b*x - c*x^2)^(1/2)))/16)*(a + b*x + c*x^2)^(7/2))/(- a - b*x - c*x^2)^(7/2)

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(exp(c*x**2+b*x+a)*(2*c*x+b)*(c*x**2+b*x+a)**(7/2),x)

[Out] Timed out

3.628 $\int e^{a+bx+cx^2}(b+2cx)\left(a+bx+cx^2\right)^{5/2}\,dx$

Optimal. Leaf size=112

$$-\frac{15}{8}\sqrt{\pi}\,\text{erfi}\left(\sqrt{a+bx+cx^2}\right)+e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{5/2}-\frac{5}{2}e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{3/2}+\frac{15}{4}e^{a+bx+cx^2}\sqrt{a+bx+cx^2}$$

```
[Out] -5/2*exp(c*x^2+b*x+a)*(c*x^2+b*x+a)^(3/2)+exp(c*x^2+b*x+a)*(c*x^2+b*x+a)^(5
/2)-15/8*erfi((c*x^2+b*x+a)^(1/2))*Pi^(1/2)+15/4*exp(c*x^2+b*x+a)*(c*x^2+b*
x+a)^(1/2)
```

Rubi [A] time = 0.46, antiderivative size = 112, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.121, Rules used = {6707, 2176, 2180, 2204}

$$-\frac{15}{8}\sqrt{\pi}\,\text{Erfi}\left(\sqrt{a+bx+cx^2}\right)+e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{5/2}-\frac{5}{2}e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{3/2}+\frac{15}{4}e^{a+bx+cx^2}\sqrt{a+bx+cx^2}$$

Antiderivative was successfully verified.

```
[In] Int[E^(a + b*x + c*x^2)*(b + 2*c*x)*(a + b*x + c*x^2)^(5/2),x]
```

```
[Out] (15*E^(a + b*x + c*x^2)*Sqrt[a + b*x + c*x^2])/4 - (5*E^(a + b*x + c*x^2)*(
a + b*x + c*x^2)^(3/2))/2 + E^(a + b*x + c*x^2)*(a + b*x + c*x^2)^(5/2) - (
15*Sqrt[Pi]*Erfi[Sqrt[a + b*x + c*x^2]])/8
```

Rule 2176

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_.), x_Symbol] :> Simp[((c + d*x)^m*(b*F^(g*(e + f*x)))^n)/(f*g*n*Log[F]),
x] - Dist[(d*m)/(f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*(b*F^(g*(e + f*x)))^n
, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && GtQ[m, 0] && IntegerQ[2*m
] &&  !$UseGamma === True
```

Rule 2180

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :
> Dist[2/d, Subst[Int[F^(g*(e - (c*f)/d) + (f*g*x^2)/d), x], x, Sqrt[c + d*
x]], x] /; FreeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 6707

```
Int[(F_)^(v_)*(u_)*(w_)^(m_.), x_Symbol] :> With[{q = DerivativeDivides[v,
u, x]}, Dist[q, Subst[Int[x^m*F^x, x], x, v], x] /;  !FalseQ[q]] /; FreeQ[{
F, m}, x] && EqQ[w, v]
```

Rubi steps

$$\int e^{a+bx+cx^2}(b+2cx)\left(a+bx+cx^2\right)^{5/2}\,dx = \text{Subst}\left(\int e^x x^{5/2}\,dx, x, a+bx+cx^2\right)$$
$$= e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{5/2} - \frac{5}{2}\text{Subst}\left(\int e^x x^{3/2}\,dx, x, a+bx+cx^2\right)$$
$$= -\frac{5}{2}e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{3/2} + e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{5/2} + \frac{15}{4}\text{Sul}$$
$$= \frac{15}{4}e^{a+bx+cx^2}\sqrt{a+bx+cx^2} - \frac{5}{2}e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{3/2} + e^{a+bx+cx}$$
$$= \frac{15}{4}e^{a+bx+cx^2}\sqrt{a+bx+cx^2} - \frac{5}{2}e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{3/2} + e^{a+bx+cx}$$
$$= \frac{15}{4}e^{a+bx+cx^2}\sqrt{a+bx+cx^2} - \frac{5}{2}e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{3/2} + e^{a+bx+cx}$$

Mathematica [A] time = 0.13, size = 46, normalized size = 0.41

$$\frac{\sqrt{a+x(b+cx)}\,\Gamma\left(\frac{7}{2},-a-x(b+cx)\right)}{\sqrt{-a-x(b+cx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a + b*x + c*x^2)*(b + 2*c*x)*(a + b*x + c*x^2)^(5/2),x]
[Out] (Sqrt[a + x*(b + c*x)]*Gamma[7/2, -a - x*(b + c*x)])/Sqrt[-a - x*(b + c*x)]
```

fricas [F] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(2\,c^3x^5 + 5\,bc^2x^4 + 4\left(b^2c + ac^2\right)x^3 + a^2b + \left(b^3 + 6\,abc\right)x^2 + 2\left(ab^2 + a^2c\right)x\right)\sqrt{cx^2 + bx + a}\,e^{\left(cx^2+bx+a\right)},\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^(5/2),x, algorithm="fric
as")
```

```
[Out] integral((2*c^3*x^5 + 5*b*c^2*x^4 + 4*(b^2*c + a*c^2)*x^3 + a^2*b + (b^3 +
6*a*b*c)*x^2 + 2*(a*b^2 + a^2*c)*x)*sqrt(c*x^2 + b*x + a)*e^(c*x^2 + b*x +
a), x)
```

giac [A] time = 0.40, size = 79, normalized size = 0.71

$$-\frac{15}{8}\sqrt{\pi}\,i\,\mathrm{erf}\left(-\sqrt{cx^2+bx+a}\,i\right)+\frac{1}{4}\left(4\left(cx^2+bx+a\right)^{\frac{5}{2}}-10\left(cx^2+bx+a\right)^{\frac{3}{2}}+15\sqrt{cx^2+bx+a}\right)e^{\left(cx^2+bx+a\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^(5/2),x, algorithm="giac
")
```

```
[Out] -15/8*sqrt(pi)*i*erf(-sqrt(c*x^2 + b*x + a)*i) + 1/4*(4*(c*x^2 + b*x + a)^(
5/2) - 10*(c*x^2 + b*x + a)^(3/2) + 15*sqrt(c*x^2 + b*x + a))*e^(c*x^2 + b*
x + a)
```

maple [A] time = 0.04, size = 94, normalized size = 0.84

$$-\frac{15\sqrt{\pi}\ \mathrm{erfi}\left(\sqrt{c\,x^2+bx+a}\right)}{8}-\frac{5\left(c\,x^2+bx+a\right)^{\frac{3}{2}}\mathrm{e}^{c\,x^2+bx+a}}{2}+\left(c\,x^2+bx+a\right)^{\frac{5}{2}}\mathrm{e}^{c\,x^2+bx+a}+\frac{15\sqrt{c\,x^2+bx+a}\ \mathrm{e}^{c\,x^2+b}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^(5/2),x)
```

```
[Out] -5/2*(c*x^2+b*x+a)^(3/2)*exp(c*x^2+b*x+a)+(c*x^2+b*x+a)^(5/2)*exp(c*x^2+b*x
+a)-15/8*erfi((c*x^2+b*x+a)^(1/2))*Pi^(1/2)+15/4*(c*x^2+b*x+a)^(1/2)*exp(c*
x^2+b*x+a)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(cx^2+bx+a\right)^{\frac{5}{2}}(2\,cx+b)e^{\left(cx^2+bx+a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^(5/2),x, algorithm="maxi
ma")
```

```
[Out] integrate((c*x^2 + b*x + a)^(5/2)*(2*c*x + b)*e^(c*x^2 + b*x + a), x)
```

mupad [B] time = 3.91, size = 117, normalized size = 1.04

$$\frac{\left(\mathrm{e}^{c\,x^2+b\,x+a}\left(\frac{15\,\sqrt{-c\,x^2-b\,x-a}}{4}+\frac{5\left(-c\,x^2-b\,x-a\right)^{3/2}}{2}+\left(-c\,x^2-b\,x-a\right)^{5/2}\right)+\frac{15\,\sqrt{\pi}\,\mathrm{erfc}\left(\sqrt{-c\,x^2-b\,x-a}\right)}{8}\right)\left(c\,x^2+b\,x+a\right)^{5/2}}{\left(-c\,x^2-b\,x-a\right)^{5/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(a + b*x + c*x^2)*(b + 2*c*x)*(a + b*x + c*x^2)^(5/2),x)
```

```
[Out] ((exp(a + b*x + c*x^2)*((15*(- a - b*x - c*x^2)^(1/2))/4 + (5*(- a - b*x -
c*x^2)^(3/2))/2 + (- a - b*x - c*x^2)^(5/2)) + (15*pi^(1/2)*erfc((- a - b*x
 - c*x^2)^(1/2)))/8)*(a + b*x + c*x^2)^(5/2))/(- a - b*x - c*x^2)^(5/2)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x**2+b*x+a)*(2*c*x+b)*(c*x**2+b*x+a)**(5/2),x)
```

```
[Out] Timed out
```

3.629 $\int e^{a+bx+cx^2}(b+2cx)\left(a+bx+cx^2\right)^{3/2}\,dx$

Optimal. Leaf size=82

$$\frac{3}{4}\sqrt{\pi}\,\text{erfi}\left(\sqrt{a+bx+cx^2}\right)+e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{3/2}-\frac{3}{2}e^{a+bx+cx^2}\sqrt{a+bx+cx^2}$$

```
[Out] exp(c*x^2+b*x+a)*(c*x^2+b*x+a)^(3/2)+3/4*erfi((c*x^2+b*x+a)^(1/2))*Pi^(1/2)
-3/2*exp(c*x^2+b*x+a)*(c*x^2+b*x+a)^(1/2)
```

Rubi [A] time = 0.36, antiderivative size = 82, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.121, Rules used = {6707, 2176, 2180, 2204}

$$\frac{3}{4}\sqrt{\pi}\,\text{Erfi}\left(\sqrt{a+bx+cx^2}\right)+e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{3/2}-\frac{3}{2}e^{a+bx+cx^2}\sqrt{a+bx+cx^2}$$

Antiderivative was successfully verified.

```
[In] Int[E^(a + b*x + c*x^2)*(b + 2*c*x)*(a + b*x + c*x^2)^(3/2),x]
```

```
[Out] (-3*E^(a + b*x + c*x^2)*Sqrt[a + b*x + c*x^2])/2 + E^(a + b*x + c*x^2)*(a +
 b*x + c*x^2)^(3/2) + (3*Sqrt[Pi]*Erfi[Sqrt[a + b*x + c*x^2]])/4
```

Rule 2176

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_.), x_Symbol] :> Simp[((c + d*x)^m*(b*F^(g*(e + f*x)))^n)/(f*g*n*Log[F]),
x] - Dist[(d*m)/(f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*(b*F^(g*(e + f*x)))^n
, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && GtQ[m, 0] && IntegerQ[2*m
] &&  !$UseGamma === True
```

Rule 2180

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :
> Dist[2/d, Subst[Int[F^(g*(e - (c*f)/d) + (f*g*x^2)/d), x], x, Sqrt[c + d*
x]], x] /; FreeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 6707

```
Int[(F_)^(v_)*(u_)*(w_)^(m_.), x_Symbol] :> With[{q = DerivativeDivides[v,
u, x]}, Dist[q, Subst[Int[x^m*F^x, x], x, v], x] /;  !FalseQ[q]] /; FreeQ[{
F, m}, x] && EqQ[w, v]
```

Rubi steps

$$\int e^{a+bx+cx^2}(b+2cx)\left(a+bx+cx^2\right)^{3/2}\,dx = \text{Subst}\left(\int e^x x^{3/2}\,dx, x, a+bx+cx^2\right)$$
$$= e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{3/2} - \frac{3}{2}\text{Subst}\left(\int e^x\sqrt{x}\,dx, x, a+bx+cx^2\right)$$
$$= -\frac{3}{2}e^{a+bx+cx^2}\sqrt{a+bx+cx^2} + e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{3/2} + \frac{3}{4}\text{Subst}($$
$$= -\frac{3}{2}e^{a+bx+cx^2}\sqrt{a+bx+cx^2} + e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{3/2} + \frac{3}{2}\text{Subst}($$
$$= -\frac{3}{2}e^{a+bx+cx^2}\sqrt{a+bx+cx^2} + e^{a+bx+cx^2}\left(a+bx+cx^2\right)^{3/2} + \frac{3}{4}\sqrt{\pi}\,\text{erfi}$$

Mathematica [A] time = 0.11, size = 47, normalized size = 0.57

$$-\frac{\sqrt{a+x(b+cx)}\,\Gamma\left(\frac{5}{2},-a-x(b+cx)\right)}{\sqrt{-a-x(b+cx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a + b*x + c*x^2)*(b + 2*c*x)*(a + b*x + c*x^2)^(3/2),x]
```

```
[Out] -((Sqrt[a + x*(b + c*x)]*Gamma[5/2, -a - x*(b + c*x)])/Sqrt[-a - x*(b + c*x
)])
```

fricas [F] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(2\,c^2x^3 + 3\,bcx^2 + ab + \left(b^2+2\,ac\right)x\right)\sqrt{cx^2+bx+a}\,e^{\left(cx^2+bx+a\right)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^(3/2),x, algorithm="fric
as")
```

```
[Out] integral((2*c^2*x^3 + 3*b*c*x^2 + a*b + (b^2 + 2*a*c)*x)*sqrt(c*x^2 + b*x +
 a)*e^(c*x^2 + b*x + a), x)
```

giac [A] time = 0.32, size = 65, normalized size = 0.79

$$\frac{3}{4}\sqrt{\pi}\, i \operatorname{erf}\left(-\sqrt{cx^2+bx+a}\, i\right)+\frac{1}{2}\left(2\left(cx^2+bx+a\right)^{\frac{3}{2}}-3\sqrt{cx^2+bx+a}\right)e^{\left(cx^2+bx+a\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^(3/2),x, algorithm="giac
")
```

```
[Out] 3/4*sqrt(pi)*i*erf(-sqrt(c*x^2 + b*x + a)*i) + 1/2*(2*(c*x^2 + b*x + a)^(3/
2) - 3*sqrt(c*x^2 + b*x + a))*e^(c*x^2 + b*x + a)
```

maple [A] time = 0.04, size = 69, normalized size = 0.84

$$\frac{3\sqrt{\pi}\ \operatorname{erfi}\left(\sqrt{c\,x^2+bx+a}\right)}{4}+\left(c\,x^2+bx+a\right)^{\frac{3}{2}} \mathrm{e}^{c\,x^2+bx+a}-\frac{3\sqrt{c\,x^2+bx+a}\ \mathrm{e}^{c\,x^2+bx+a}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^(3/2),x)
```

```
[Out] (c*x^2+b*x+a)^(3/2)*exp(c*x^2+b*x+a)+3/4*erfi((c*x^2+b*x+a)^(1/2))*Pi^(1/2)
-3/2*(c*x^2+b*x+a)^(1/2)*exp(c*x^2+b*x+a)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\left(cx^2+bx+a\right)^{\frac{3}{2}}(2\,cx+b)e^{\left(cx^2+bx+a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^(3/2),x, algorithm="maxi
ma")
```

```
[Out] integrate((c*x^2 + b*x + a)^(3/2)*(2*c*x + b)*e^(c*x^2 + b*x + a), x)
```

mupad [B] time = 3.77, size = 102, normalized size = 1.24

$$\frac{3\sqrt{\pi}\ \operatorname{erfc}\left(\sqrt{-c\,x^2-b\,x-a}\right)\left(c\,x^2+b\,x+a\right)^{3/2}}{4\left(-c\,x^2-b\,x-a\right)^{3/2}}-\frac{3\,\mathrm{e}^{b\,x}\,\mathrm{e}^{a}\,\mathrm{e}^{c\,x^2}\sqrt{c\,x^2+b\,x+a}}{2}+\mathrm{e}^{b\,x}\,\mathrm{e}^{a}\,\mathrm{e}^{c\,x^2}\left(c\,x^2+b\,x+a\right)^{3/2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(a + b*x + c*x^2)*(b + 2*c*x)*(a + b*x + c*x^2)^(3/2),x)
```

```
[Out] (3*pi^(1/2)*erfc((- a - b*x - c*x^2)^(1/2))*(a + b*x + c*x^2)^(3/2))/(4*(-
a - b*x - c*x^2)^(3/2)) - (3*exp(b*x)*exp(a)*exp(c*x^2)*(a + b*x + c*x^2)^(
1/2))/2 + exp(b*x)*exp(a)*exp(c*x^2)*(a + b*x + c*x^2)^(3/2)
```

sympy [A] time = 86.53, size = 94, normalized size = 1.15

$$\frac{\left(-\sqrt{-a-bx-cx^2}\left(a+bx+cx^2-\frac{3}{2}\right)e^{a+bx+cx^2}+\frac{3\sqrt{\pi}\operatorname{erfc}\left(\sqrt{-a-bx-cx^2}\right)}{4}\right)\left(a+bx+cx^2\right)^{\frac{3}{2}}}{\left(-a-bx-cx^2\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x**2+b*x+a)*(2*c*x+b)*(c*x**2+b*x+a)**(3/2),x)
```

```
[Out] (-sqrt(-a - b*x - c*x**2)*(a + b*x + c*x**2 - 3/2)*exp(a + b*x + c*x**2) +
3*sqrt(pi)*erfc(sqrt(-a - b*x - c*x**2))/4)*(a + b*x + c*x**2)**(3/2)/(-a -
 b*x - c*x**2)**(3/2)
```

3.630 $\int e^{a+bx+cx^2}(b+2cx)\sqrt{a+bx+cx^2}\,dx$

Optimal. Leaf size=52

$$e^{a+bx+cx^2}\sqrt{a+bx+cx^2}-\frac{1}{2}\sqrt{\pi}\,\text{erfi}\left(\sqrt{a+bx+cx^2}\right)$$

```
[Out] -1/2*erfi((c*x^2+b*x+a)^(1/2))*Pi^(1/2)+exp(c*x^2+b*x+a)*(c*x^2+b*x+a)^(1/2
)
```

Rubi [A] time = 0.23, antiderivative size = 52, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.121, Rules used = {6707, 2176, 2180, 2204}

$$e^{a+bx+cx^2}\sqrt{a+bx+cx^2}-\frac{1}{2}\sqrt{\pi}\,\text{Erfi}\left(\sqrt{a+bx+cx^2}\right)$$

Antiderivative was successfully verified.

```
[In] Int[E^(a + b*x + c*x^2)*(b + 2*c*x)*Sqrt[a + b*x + c*x^2],x]
```

```
[Out] E^(a + b*x + c*x^2)*Sqrt[a + b*x + c*x^2] - (Sqrt[Pi]*Erfi[Sqrt[a + b*x + c
*x^2]])/2
```

Rule 2176

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_.), x_Symbol] :> Simp[((c + d*x)^m*(b*F^(g*(e + f*x)))^n)/(f*g*n*Log[F]),
x] - Dist[(d*m)/(f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*(b*F^(g*(e + f*x)))^n
, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && GtQ[m, 0] && IntegerQ[2*m
] &&  !$UseGamma === True
```

Rule 2180

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :
> Dist[2/d, Subst[Int[F^(g*(e - (c*f)/d) + (f*g*x^2)/d), x], x, Sqrt[c + d*
x]], x] /; FreeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 6707

```
Int[(F_)^(v_)*(u_)*(w_)^(m_.), x_Symbol] :> With[{q = DerivativeDivides[v,
u, x]}, Dist[q, Subst[Int[x^m*F^x, x], x, v], x] /;  !FalseQ[q]] /; FreeQ[{
F, m}, x] && EqQ[w, v]
```

Rubi steps

$$\begin{aligned}
\int e^{a+bx+cx^2}(b+2cx)\sqrt{a+bx+cx^2}\,dx &= \text{Subst}\left(\int e^x\sqrt{x}\,dx, x, a+bx+cx^2\right)\\
&= e^{a+bx+cx^2}\sqrt{a+bx+cx^2} - \frac{1}{2}\text{Subst}\left(\int \frac{e^x}{\sqrt{x}}\,dx, x, a+bx+cx^2\right)\\
&= e^{a+bx+cx^2}\sqrt{a+bx+cx^2} - \text{Subst}\left(\int e^{x^2}\,dx, x, \sqrt{a+bx+cx^2}\right)\\
&= e^{a+bx+cx^2}\sqrt{a+bx+cx^2} - \frac{1}{2}\sqrt{\pi}\,\text{erfi}\left(\sqrt{a+bx+cx^2}\right)
\end{aligned}$$

Mathematica [A] time = 0.05, size = 46, normalized size = 0.88

$$\frac{\sqrt{a+x(b+cx)}\,\Gamma\left(\frac{3}{2},-a-x(b+cx)\right)}{\sqrt{-a-x(b+cx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a + b*x + c*x^2)*(b + 2*c*x)*Sqrt[a + b*x + c*x^2],x]
[Out] (Sqrt[a + x*(b + c*x)]*Gamma[3/2, -a - x*(b + c*x)])/Sqrt[-a - x*(b + c*x)]
```

fricas [F] time = 0.40, size = 0, normalized size = 0.00

$$\text{integral}\left(\sqrt{cx^2+bx+a}\,(2\,cx+b)e^{\left(cx^2+bx+a\right)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^(1/2),x, algorithm="fric
as")
[Out] integral(sqrt(c*x^2 + b*x + a)*(2*c*x + b)*e^(c*x^2 + b*x + a), x)
```

giac [A] time = 0.31, size = 47, normalized size = 0.90

$$-\frac{1}{2}\sqrt{\pi}\,i\,\text{erf}\left(-\sqrt{cx^2+bx+a}\,i\right) + \sqrt{cx^2+bx+a}\,e^{\left(cx^2+bx+a\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^(1/2),x, algorithm="giac
")
```

```
[Out] -1/2*sqrt(pi)*i*erf(-sqrt(c*x^2 + b*x + a)*i) + sqrt(c*x^2 + b*x + a)*e^(c*
x^2 + b*x + a)
```

maple [A] time = 0.04, size = 44, normalized size = 0.85

$$-\frac{\sqrt{\pi}\ \operatorname{erfi}\left(\sqrt{c\,x^{2}+bx+a}\right)}{2}+\sqrt{c\,x^{2}+bx+a}\ \mathrm{e}^{c\,x^{2}+bx+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^(1/2),x)
```

```
[Out] -1/2*erfi((c*x^2+b*x+a)^(1/2))*Pi^(1/2)+(c*x^2+b*x+a)^(1/2)*exp(c*x^2+b*x+a
)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{cx^{2}+bx+a}\,(2\,cx+b)e^{\left(cx^{2}+bx+a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)*(c*x^2+b*x+a)^(1/2),x, algorithm="maxi
ma")
```

```
[Out] integrate(sqrt(c*x^2 + b*x + a)*(2*c*x + b)*e^(c*x^2 + b*x + a), x)
```

mupad [B] time = 3.51, size = 76, normalized size = 1.46

$$\frac{\sqrt{\pi}\ \operatorname{erfc}\left(\sqrt{-c\,x^{2}-b\,x-a}\right)\ \sqrt{c\,x^{2}+b\,x+a}}{2\,\sqrt{-c\,x^{2}-b\,x-a}}+\mathrm{e}^{b\,x}\ \mathrm{e}^{a}\ \mathrm{e}^{c\,x^{2}}\ \sqrt{c\,x^{2}+b\,x+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(a + b*x + c*x^2)*(b + 2*c*x)*(a + b*x + c*x^2)^(1/2),x)
```

```
[Out] (pi^(1/2)*erfc((- a - b*x - c*x^2)^(1/2))*(a + b*x + c*x^2)^(1/2))/(2*(- a
- b*x - c*x^2)^(1/2)) + exp(b*x)*exp(a)*exp(c*x^2)*(a + b*x + c*x^2)^(1/2)
```

sympy [A] time = 5.80, size = 78, normalized size = 1.50

$$\frac{\left(\sqrt{-a-bx-cx^{2}}\,e^{a+bx+cx^{2}}+\frac{\sqrt{\pi}\ \operatorname{erfc}\left(\sqrt{-a-bx-cx^{2}}\right)}{2}\right)\sqrt{a+bx+cx^{2}}}{\sqrt{-a-bx-cx^{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x**2+b*x+a)*(2*c*x+b)*(c*x**2+b*x+a)**(1/2),x)
```

```
[Out] (sqrt(-a - b*x - c*x**2)*exp(a + b*x + c*x**2) + sqrt(pi)*erfc(sqrt(-a - b*
x - c*x**2))/2)*sqrt(a + b*x + c*x**2)/sqrt(-a - b*x - c*x**2)
```

3.631 $\int \frac{e^{a+bx+cx^2}(b+2cx)}{\sqrt{a+bx+cx^2}}\,dx$

Optimal. Leaf size=21

$$\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{a+bx+cx^2}\right)$$

```
[Out] erfi((c*x^2+b*x+a)^(1/2))*Pi^(1/2)
```

Rubi [A] time = 0.26, antiderivative size = 21, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {6707, 2180, 2204}

$$\sqrt{\pi}\,\mathrm{Erfi}\left(\sqrt{a+bx+cx^2}\right)$$

Antiderivative was successfully verified.

```
[In] Int[(E^(a + b*x + c*x^2)*(b + 2*c*x))/Sqrt[a + b*x + c*x^2],x]
```

```
[Out] Sqrt[Pi]*Erfi[Sqrt[a + b*x + c*x^2]]
```

Rule 2180

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :
> Dist[2/d, Subst[Int[F^(g*(e - (c*f)/d) + (f*g*x^2)/d), x], x, Sqrt[c + d*
x]], x] /; FreeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 6707

```
Int[(F_)^(v_)*(u_)*(w_)^(m_.), x_Symbol] :> With[{q = DerivativeDivides[v,
u, x]}, Dist[q, Subst[Int[x^m*F^x, x], x, v], x] /;  !FalseQ[q]] /; FreeQ[{
F, m}, x] && EqQ[w, v]
```

Rubi steps

$$\int \frac{e^{a+bx+cx^2}(b+2cx)}{\sqrt{a+bx+cx^2}}\,dx = \text{Subst}\left(\int \frac{e^x}{\sqrt{x}}\,dx, x, a+bx+cx^2\right)$$
$$= 2\,\text{Subst}\left(\int e^{x^2}\,dx, x, \sqrt{a+bx+cx^2}\right)$$
$$= \sqrt{\pi}\,\text{erfi}\left(\sqrt{a+bx+cx^2}\right)$$

Mathematica [B] time = 0.06, size = 46, normalized size = 2.19

$$\frac{\sqrt{-a-x(b+cx)}\,\Gamma\left(\frac{1}{2},-a-x(b+cx)\right)}{\sqrt{a+x(b+cx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^(a + b*x + c*x^2)*(b + 2*c*x))/Sqrt[a + b*x + c*x^2],x]
[Out] (Sqrt[-a - x*(b + c*x)]*Gamma[1/2, -a - x*(b + c*x)])/Sqrt[a + x*(b + c*x)]
```

fricas [F] time = 0.40, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{(2\,cx+b)e^{\left(cx^2+bx+a\right)}}{\sqrt{cx^2+bx+a}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^(1/2),x, algorithm="fric
as")
[Out] integral((2*c*x + b)*e^(c*x^2 + b*x + a)/sqrt(c*x^2 + b*x + a), x)
```

giac [A] time = 0.21, size = 21, normalized size = 1.00

$$\sqrt{\pi}\,i\,\text{erf}\left(-\sqrt{cx^2+bx+a}\,i\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^(1/2),x, algorithm="giac
")
[Out] sqrt(pi)*i*erf(-sqrt(c*x^2 + b*x + a)*i)
```

maple [A] time = 0.04, size = 18, normalized size = 0.86

$$\sqrt{\pi}\ \mathrm{erfi}\left(\sqrt{c\,x^{2}+bx+a}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^(1/2),x)
```

```
[Out] erfi((c*x^2+b*x+a)^(1/2))*Pi^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(2\,cx+b)e^{\left(cx^{2}+bx+a\right)}}{\sqrt{cx^{2}+bx+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^(1/2),x, algorithm="maxi
ma")
```

```
[Out] integrate((2*c*x + b)*e^(c*x^2 + b*x + a)/sqrt(c*x^2 + b*x + a), x)
```

mupad [B] time = 3.90, size = 49, normalized size = 2.33

$$\frac{\sqrt{\pi}\ \mathrm{erfc}\left(\sqrt{-c\,x^{2}-b\,x-a}\right)\,\sqrt{-c\,x^{2}-b\,x-a}}{\sqrt{c\,x^{2}+b\,x+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(a + b*x + c*x^2)*(b + 2*c*x))/(a + b*x + c*x^2)^(1/2),x)
```

```
[Out] (pi^(1/2)*erfc((- a - b*x - c*x^2)^(1/2))*(- a - b*x - c*x^2)^(1/2))/(a + b
*x + c*x^2)^(1/2)
```

sympy [B] time = 4.43, size = 49, normalized size = 2.33

$$\frac{\sqrt{\pi}\,\sqrt{-a-bx-cx^{2}}\ \mathrm{erfc}\left(\sqrt{-a-bx-cx^{2}}\right)}{\sqrt{a+bx+cx^{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x**2+b*x+a)*(2*c*x+b)/(c*x**2+b*x+a)**(1/2),x)
```

```
[Out] sqrt(pi)*sqrt(-a - b*x - c*x**2)*erfc(sqrt(-a - b*x - c*x**2))/sqrt(a + b*x
 + c*x**2)
```

3.632 $\int \frac{e^{a+bx+cx^2}(b+2cx)}{\left(a+bx+cx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=51

$$2\sqrt{\pi}\,\text{erfi}\left(\sqrt{a+bx+cx^2}\right)-\frac{2e^{a+bx+cx^2}}{\sqrt{a+bx+cx^2}}$$

```
[Out] 2*erfi((c*x^2+b*x+a)^(1/2))*Pi^(1/2)-2*exp(c*x^2+b*x+a)/(c*x^2+b*x+a)^(1/2)
```

Rubi [A] time = 0.31, antiderivative size = 51, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.121, Rules used = {6707, 2177, 2180, 2204}

$$2\sqrt{\pi}\,\text{Erfi}\left(\sqrt{a+bx+cx^2}\right)-\frac{2e^{a+bx+cx^2}}{\sqrt{a+bx+cx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(E^(a + b*x + c*x^2)*(b + 2*c*x))/(a + b*x + c*x^2)^(3/2),x]
```

```
[Out] (-2*E^(a + b*x + c*x^2))/Sqrt[a + b*x + c*x^2] + 2*Sqrt[Pi]*Erfi[Sqrt[a + b
*x + c*x^2]]
```

Rule 2177

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_), x_Symbol] :> Simp[((c + d*x)^(m + 1)*(b*F^(g*(e + f*x)))^n)/(d*(m + 1))
, x] - Dist[(f*g*n*Log[F])/(d*(m + 1)), Int[(c + d*x)^(m + 1)*(b*F^(g*(e +
f*x)))^n, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && LtQ[m, -1] && Int
egerQ[2*m] &&  !$UseGamma === True
```

Rule 2180

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :
> Dist[2/d, Subst[Int[F^(g*(e - (c*f)/d) + (f*g*x^2)/d), x], x, Sqrt[c + d*
x]], x] /; FreeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 6707

```
Int[(F_)^(v_)*(u_)*(w_)^(m_.), x_Symbol] :> With[{q = DerivativeDivides[v,
u, x]}, Dist[q, Subst[Int[x^m*F^x, x], x, v], x] /;  !FalseQ[q]] /; FreeQ[{
F, m}, x] && EqQ[w, v]
```

Rubi steps

$$\begin{aligned}
\int \frac{e^{a+bx+cx^2}(b+2cx)}{\left(a+bx+cx^2\right)^{3/2}}\,dx &= \text{Subst}\left(\int \frac{e^x}{x^{3/2}}\,dx, x, a+bx+cx^2\right)\\
&= -\frac{2e^{a+bx+cx^2}}{\sqrt{a+bx+cx^2}} + 2\,\text{Subst}\left(\int \frac{e^x}{\sqrt{x}}\,dx, x, a+bx+cx^2\right)\\
&= -\frac{2e^{a+bx+cx^2}}{\sqrt{a+bx+cx^2}} + 4\,\text{Subst}\left(\int e^{x^2}\,dx, x, \sqrt{a+bx+cx^2}\right)\\
&= -\frac{2e^{a+bx+cx^2}}{\sqrt{a+bx+cx^2}} + 2\sqrt{\pi}\,\text{erfi}\left(\sqrt{a+bx+cx^2}\right)
\end{aligned}$$

Mathematica [A] time = 0.10, size = 62, normalized size = 1.22

$$\frac{2\sqrt{-a-x(b+cx)}\,\Gamma\left(\frac{1}{2},-a-x(b+cx)\right)-2e^{a+x(b+cx)}}{\sqrt{a+x(b+cx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^(a + b*x + c*x^2)*(b + 2*c*x))/(a + b*x + c*x^2)^(3/2),x]
```

```
[Out] (-2*E^(a + x*(b + c*x)) + 2*Sqrt[-a - x*(b + c*x)]*Gamma[1/2, -a - x*(b + c
*x)])/Sqrt[a + x*(b + c*x)]
```

fricas [F] time = 0.40, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{cx^2+bx+a}\,(2\,cx+b)e^{\left(cx^2+bx+a\right)}}{c^2x^4+2\,bcx^3+2\,abx+\left(b^2+2\,ac\right)x^2+a^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^(3/2),x, algorithm="fric
as")
```

```
[Out] integral(sqrt(c*x^2 + b*x + a)*(2*c*x + b)*e^(c*x^2 + b*x + a)/(c^2*x^4 + 2
*b*c*x^3 + 2*a*b*x + (b^2 + 2*a*c)*x^2 + a^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(2\,cx+b)e^{\left(cx^2+bx+a\right)}}{\left(cx^2+bx+a\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^(3/2),x, algorithm="giac
")
```

```
[Out] integrate((2*c*x + b)*e^(c*x^2 + b*x + a)/(c*x^2 + b*x + a)^(3/2), x)
```

maple [A] time = 0.04, size = 45, normalized size = 0.88

$$2\sqrt{\pi}\ \mathrm{erfi}\left(\sqrt{c\,x^2+bx+a}\right)-\frac{2\,\mathrm{e}^{c\,x^2+bx+a}}{\sqrt{c\,x^2+bx+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^(3/2),x)
```

```
[Out] 2*erfi((c*x^2+b*x+a)^(1/2))*Pi^(1/2)-2*exp(c*x^2+b*x+a)/(c*x^2+b*x+a)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(2\,cx+b)e^{\left(cx^2+bx+a\right)}}{\left(cx^2+bx+a\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^(3/2),x, algorithm="maxi
ma")
```

```
[Out] integrate((2*c*x + b)*e^(c*x^2 + b*x + a)/(c*x^2 + b*x + a)^(3/2), x)
```

mupad [B] time = 4.00, size = 79, normalized size = 1.55

$$-\frac{\mathrm{e}^{c\,x^2+b\,x+a}\,\left(2\,c\,x^2+2\,b\,x+2\,a\right)+2\,\sqrt{\pi}\ \mathrm{erfc}\left(\sqrt{-c\,x^2-b\,x-a}\right)\,{\left(-c\,x^2-b\,x-a\right)}^{3/2}}{{\left(c\,x^2+b\,x+a\right)}^{3/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(a + b*x + c*x^2)*(b + 2*c*x))/(a + b*x + c*x^2)^(3/2),x)
```

```
[Out] -(exp(a + b*x + c*x^2)*(2*a + 2*b*x + 2*c*x^2) + 2*pi^(1/2)*erfc((- a - b*x
 - c*x^2)^(1/2))*(- a - b*x - c*x^2)^(3/2))/(a + b*x + c*x^2)^(3/2)
```

sympy [A] time = 6.49, size = 80, normalized size = 1.57

$$\frac{\left(-2\sqrt{\pi}\,\operatorname{erfc}\left(\sqrt{-a-bx-cx^2}\right)+\frac{2e^{a+bx+cx^2}}{\sqrt{-a-bx-cx^2}}\right)\left(-a-bx-cx^2\right)^{\frac{3}{2}}}{\left(a+bx+cx^2\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x**2+b*x+a)*(2*c*x+b)/(c*x**2+b*x+a)**(3/2),x)
```

```
[Out] (-2*sqrt(pi)*erfc(sqrt(-a - b*x - c*x**2)) + 2*exp(a + b*x + c*x**2)/sqrt(-
a - b*x - c*x**2))*(-a - b*x - c*x**2)**(3/2)/(a + b*x + c*x**2)**(3/2)
```

3.633 $\int \frac{e^{a+bx+cx^2}(b+2cx)}{\left(a+bx+cx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=85

$$\frac{4}{3}\sqrt{\pi}\,\text{erfi}\left(\sqrt{a+bx+cx^2}\right)-\frac{4e^{a+bx+cx^2}}{3\sqrt{a+bx+cx^2}}-\frac{2e^{a+bx+cx^2}}{3\left(a+bx+cx^2\right)^{3/2}}$$

```
[Out] -2/3*exp(c*x^2+b*x+a)/(c*x^2+b*x+a)^(3/2)+4/3*erfi((c*x^2+b*x+a)^(1/2))*Pi^
(1/2)-4/3*exp(c*x^2+b*x+a)/(c*x^2+b*x+a)^(1/2)
```

Rubi [A] time = 0.35, antiderivative size = 85, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.121, Rules used = {6707, 2177, 2180, 2204}

$$\frac{4}{3}\sqrt{\pi}\,\text{Erfi}\left(\sqrt{a+bx+cx^2}\right)-\frac{4e^{a+bx+cx^2}}{3\sqrt{a+bx+cx^2}}-\frac{2e^{a+bx+cx^2}}{3\left(a+bx+cx^2\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(E^(a + b*x + c*x^2)*(b + 2*c*x))/(a + b*x + c*x^2)^(5/2),x]
```

```
[Out] (-2*E^(a + b*x + c*x^2))/(3*(a + b*x + c*x^2)^(3/2)) - (4*E^(a + b*x + c*x^
2))/(3*Sqrt[a + b*x + c*x^2]) + (4*Sqrt[Pi]*Erfi[Sqrt[a + b*x + c*x^2]])/3
```

Rule 2177

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_), x_Symbol] :> Simp[((c + d*x)^(m + 1)*(b*F^(g*(e + f*x)))^n)/(d*(m + 1))
, x] - Dist[(f*g*n*Log[F])/(d*(m + 1)), Int[(c + d*x)^(m + 1)*(b*F^(g*(e +
f*x)))^n, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && LtQ[m, -1] && Int
egerQ[2*m] &&  !$UseGamma === True
```

Rule 2180

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :
> Dist[2/d, Subst[Int[F^(g*(e - (c*f)/d) + (f*g*x^2)/d), x], x, Sqrt[c + d*
x]], x] /; FreeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
```

```
F, a, b, c, d}, x] && PosQ[b]
```

Rule 6707

```
Int[(F_)^(v_)*(u_)*(w_)^(m_.), x_Symbol] :> With[{q = DerivativeDivides[v,
u, x]}, Dist[q, Subst[Int[x^m*F^x, x], x, v], x] /;  !FalseQ[q]] /; FreeQ[{
F, m}, x] && EqQ[w, v]
```

Rubi steps

$$
\begin{aligned}
\int \frac{e^{a+bx+cx^2}(b+2cx)}{\left(a+bx+cx^2\right)^{5/2}}\,dx &= \text{Subst}\left(\int \frac{e^x}{x^{5/2}}\,dx, x, a+bx+cx^2\right)\\
&= -\frac{2e^{a+bx+cx^2}}{3\left(a+bx+cx^2\right)^{3/2}} + \frac{2}{3}\,\text{Subst}\left(\int \frac{e^x}{x^{3/2}}\,dx, x, a+bx+cx^2\right)\\
&= -\frac{2e^{a+bx+cx^2}}{3\left(a+bx+cx^2\right)^{3/2}} - \frac{4e^{a+bx+cx^2}}{3\sqrt{a+bx+cx^2}} + \frac{4}{3}\,\text{Subst}\left(\int \frac{e^x}{\sqrt{x}}\,dx, x, a+bx+cx^2\right)\\
&= -\frac{2e^{a+bx+cx^2}}{3\left(a+bx+cx^2\right)^{3/2}} - \frac{4e^{a+bx+cx^2}}{3\sqrt{a+bx+cx^2}} + \frac{8}{3}\,\text{Subst}\left(\int e^{x^2}\,dx, x, \sqrt{a+bx+cx^2}\right)\\
&= -\frac{2e^{a+bx+cx^2}}{3\left(a+bx+cx^2\right)^{3/2}} - \frac{4e^{a+bx+cx^2}}{3\sqrt{a+bx+cx^2}} + \frac{4}{3}\sqrt{\pi}\,\text{erfi}\left(\sqrt{a+bx+cx^2}\right)
\end{aligned}
$$

Mathematica [A] time = 0.13, size = 77, normalized size = 0.91

$$
-\frac{2\left(e^{a+x(b+cx)}(2(a+x(b+cx))+1)+2(-a-x(b+cx))^{3/2}\Gamma\left(\frac{1}{2},-a-x(b+cx)\right)\right)}{3(a+x(b+cx))^{3/2}}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^(a + b*x + c*x^2)*(b + 2*c*x))/(a + b*x + c*x^2)^(5/2),x]
```

```
[Out] (-2*(E^(a + x*(b + c*x))*(1 + 2*(a + x*(b + c*x))) + 2*(-a - x*(b + c*x))^(
3/2)*Gamma[1/2, -a - x*(b + c*x)]))/(3*(a + x*(b + c*x))^(3/2))
```

fricas [F] time = 0.42, size = 0, normalized size = 0.00

$$
\text{integral}\left(\frac{\sqrt{cx^2+bx+a}\,(2\,cx+b)e^{\left(cx^2+bx+a\right)}}{c^3x^6+3\,bc^2x^5+3\left(b^2c+ac^2\right)x^4+3\,a^2bx+\left(b^3+6\,abc\right)x^3+a^3+3\left(ab^2+a^2c\right)x^2}, x\right)
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^(5/2),x, algorithm="fric
as")
```

```
[Out] integral(sqrt(c*x^2 + b*x + a)*(2*c*x + b)*e^(c*x^2 + b*x + a)/(c^3*x^6 + 3
*b*c^2*x^5 + 3*(b^2*c + a*c^2)*x^4 + 3*a^2*b*x + (b^3 + 6*a*b*c)*x^3 + a^3
+ 3*(a*b^2 + a^2*c)*x^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(2\,cx+b)e^{\left(cx^2+bx+a\right)}}{\left(cx^2+bx+a\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^(5/2),x, algorithm="giac
")
```

```
[Out] integrate((2*c*x + b)*e^(c*x^2 + b*x + a)/(c*x^2 + b*x + a)^(5/2), x)
```

maple [A] time = 0.04, size = 70, normalized size = 0.82

$$\frac{4\sqrt{\pi}\ \operatorname{erfi}\left(\sqrt{c\,x^2+bx+a}\right)}{3}-\frac{2\,\mathrm{e}^{c\,x^2+bx+a}}{3\left(c\,x^2+bx+a\right)^{\frac{3}{2}}}-\frac{4\,\mathrm{e}^{c\,x^2+bx+a}}{3\sqrt{c\,x^2+bx+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^(5/2),x)
```

```
[Out] -2/3*exp(c*x^2+b*x+a)/(c*x^2+b*x+a)^(3/2)+4/3*erfi((c*x^2+b*x+a)^(1/2))*Pi^
(1/2)-4/3/(c*x^2+b*x+a)^(1/2)*exp(c*x^2+b*x+a)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(2\,cx+b)e^{\left(cx^2+bx+a\right)}}{\left(cx^2+bx+a\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^(5/2),x, algorithm="maxi
ma")
```

```
[Out] integrate((2*c*x + b)*e^(c*x^2 + b*x + a)/(c*x^2 + b*x + a)^(5/2), x)
```

mupad [B] time = 4.20, size = 104, normalized size = 1.22

$$-\frac{e^{c\,x^2+b\,x+a}\,\left(2\,c\,x^2+2\,b\,x+2\,a\right)+4\,e^{c\,x^2+b\,x+a}\,{\left(c\,x^2+b\,x+a\right)}^2-4\,\sqrt{\pi}\,\mathrm{erfc}\left(\sqrt{-c\,x^2-b\,x-a}\right)\,{\left(-c\,x^2-b\,x-a\right)}^{5}}{3\,{\left(c\,x^2+b\,x+a\right)}^{5/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(a + b*x + c*x^2)*(b + 2*c*x))/(a + b*x + c*x^2)^(5/2),x)
```

```
[Out] -(exp(a + b*x + c*x^2)*(2*a + 2*b*x + 2*c*x^2) + 4*exp(a + b*x + c*x^2)*(a
+ b*x + c*x^2)^2 - 4*pi^(1/2)*erfc((- a - b*x - c*x^2)^(1/2))*(- a - b*x -
c*x^2)^(5/2))/(3*(a + b*x + c*x^2)^(5/2))
```

sympy [A] time = 37.58, size = 105, normalized size = 1.24

$$\frac{\left(\frac{4\sqrt{\pi}\,\mathrm{erfc}\left(\sqrt{-a-bx-cx^2}\right)}{3}-\frac{\left(-\frac{4a}{3}-\frac{4bx}{3}-\frac{4cx^2}{3}-\frac{2}{3}\right)e^{a+bx+cx^2}}{\left(-a-bx-cx^2\right)^{\frac{3}{2}}}\right)\left(-a-bx-cx^2\right)^{\frac{5}{2}}}{\left(a+bx+cx^2\right)^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x**2+b*x+a)*(2*c*x+b)/(c*x**2+b*x+a)**(5/2),x)
```

```
[Out] (4*sqrt(pi)*erfc(sqrt(-a - b*x - c*x**2))/3 - (-4*a/3 - 4*b*x/3 - 4*c*x**2/
3 - 2/3)*exp(a + b*x + c*x**2)/(-a - b*x - c*x**2)**(3/2))*(-a - b*x - c*x*
*2)**(5/2)/(a + b*x + c*x**2)**(5/2)
```

3.634 $\int \frac{e^{a+bx+cx^2}(b+2cx)}{\left(a+bx+cx^2\right)^{7/2}}\,dx$

Optimal. Leaf size=115

$$\frac{8}{15}\sqrt{\pi}\,\text{erfi}\left(\sqrt{a+bx+cx^2}\right)-\frac{8e^{a+bx+cx^2}}{15\sqrt{a+bx+cx^2}}-\frac{4e^{a+bx+cx^2}}{15\left(a+bx+cx^2\right)^{3/2}}-\frac{2e^{a+bx+cx^2}}{5\left(a+bx+cx^2\right)^{5/2}}$$

```
[Out] -2/5*exp(c*x^2+b*x+a)/(c*x^2+b*x+a)^(5/2)-4/15*exp(c*x^2+b*x+a)/(c*x^2+b*x+
a)^(3/2)+8/15*erfi((c*x^2+b*x+a)^(1/2))*Pi^(1/2)-8/15*exp(c*x^2+b*x+a)/(c*x
^2+b*x+a)^(1/2)
```

Rubi [A] time = 0.35, antiderivative size = 115, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.121, Rules used = {6707, 2177, 2180, 2204}

$$\frac{8}{15}\sqrt{\pi}\,\text{Erfi}\left(\sqrt{a+bx+cx^2}\right)-\frac{8e^{a+bx+cx^2}}{15\sqrt{a+bx+cx^2}}-\frac{4e^{a+bx+cx^2}}{15\left(a+bx+cx^2\right)^{3/2}}-\frac{2e^{a+bx+cx^2}}{5\left(a+bx+cx^2\right)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(E^(a + b*x + c*x^2)*(b + 2*c*x))/(a + b*x + c*x^2)^(7/2),x]
```

```
[Out] (-2*E^(a + b*x + c*x^2))/(5*(a + b*x + c*x^2)^(5/2)) - (4*E^(a + b*x + c*x^
2))/(15*(a + b*x + c*x^2)^(3/2)) - (8*E^(a + b*x + c*x^2))/(15*Sqrt[a + b*x
 + c*x^2]) + (8*Sqrt[Pi]*Erfi[Sqrt[a + b*x + c*x^2]])/15
```

Rule 2177

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_), x_Symbol] :> Simp[((c + d*x)^(m + 1)*(b*F^(g*(e + f*x)))^n)/(d*(m + 1))
, x] - Dist[(f*g*n*Log[F])/(d*(m + 1)), Int[(c + d*x)^(m + 1)*(b*F^(g*(e +
f*x)))^n, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && LtQ[m, -1] && Int
egerQ[2*m] &&  !$UseGamma === True
```

Rule 2180

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :
> Dist[2/d, Subst[Int[F^(g*(e - (c*f)/d) + (f*g*x^2)/d), x], x, Sqrt[c + d*
x]], x] /; FreeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 6707

```
Int[(F_)^(v_)*(u_)*(w_)^(m_.), x_Symbol] :> With[{q = DerivativeDivides[v,
u, x]}, Dist[q, Subst[Int[x^m*F^x, x], x, v], x] /;  !FalseQ[q]] /; FreeQ[{
F, m}, x] && EqQ[w, v]
```

Rubi steps

$$\int \frac{e^{a+bx+cx^2}(b+2cx)}{\left(a+bx+cx^2\right)^{7/2}}\,dx = \text{Subst}\left(\int \frac{e^x}{x^{7/2}}\,dx, x, a+bx+cx^2\right)$$
$$= -\frac{2e^{a+bx+cx^2}}{5\left(a+bx+cx^2\right)^{5/2}} + \frac{2}{5}\text{Subst}\left(\int \frac{e^x}{x^{5/2}}\,dx, x, a+bx+cx^2\right)$$
$$= -\frac{2e^{a+bx+cx^2}}{5\left(a+bx+cx^2\right)^{5/2}} - \frac{4e^{a+bx+cx^2}}{15\left(a+bx+cx^2\right)^{3/2}} + \frac{4}{15}\text{Subst}\left(\int \frac{e^x}{x^{3/2}}\,dx, x, a+bx+cx^2\right)$$
$$= -\frac{2e^{a+bx+cx^2}}{5\left(a+bx+cx^2\right)^{5/2}} - \frac{4e^{a+bx+cx^2}}{15\left(a+bx+cx^2\right)^{3/2}} - \frac{8e^{a+bx+cx^2}}{15\sqrt{a+bx+cx^2}} + \frac{8}{15}\text{Subst}\left(\int \frac{e^x}{\sqrt{x}}\,d\right.$$
$$= -\frac{2e^{a+bx+cx^2}}{5\left(a+bx+cx^2\right)^{5/2}} - \frac{4e^{a+bx+cx^2}}{15\left(a+bx+cx^2\right)^{3/2}} - \frac{8e^{a+bx+cx^2}}{15\sqrt{a+bx+cx^2}} + \frac{16}{15}\text{Subst}\left(\int e^{x^2}\,dx\right.$$
$$= -\frac{2e^{a+bx+cx^2}}{5\left(a+bx+cx^2\right)^{5/2}} - \frac{4e^{a+bx+cx^2}}{15\left(a+bx+cx^2\right)^{3/2}} - \frac{8e^{a+bx+cx^2}}{15\sqrt{a+bx+cx^2}} + \frac{8}{15}\sqrt{\pi}\,\text{erfi}\left(\sqrt{a+b\right.$$

Mathematica [A] time = 0.18, size = 91, normalized size = 0.79

$$\frac{8(-a-x(b+cx))^{5/2}\Gamma\left(\frac{1}{2},-a-x(b+cx)\right)-2e^{a+x(b+cx)}\left(4(a+x(b+cx))^2+2(a+x(b+cx))+3\right)}{15(a+x(b+cx))^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^(a + b*x + c*x^2)*(b + 2*c*x))/(a + b*x + c*x^2)^(7/2),x]
```

```
[Out] (-2*E^(a + x*(b + c*x))*(3 + 2*(a + x*(b + c*x)) + 4*(a + x*(b + c*x))^2) +
 8*(-a - x*(b + c*x))^(5/2)*Gamma[1/2, -a - x*(b + c*x)])/(15*(a + x*(b + c
*x))^(5/2))
```

fricas [F] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{cx^2+bx+a}\,(2\,cx+b)e^{\left(cx^2+bx+a\right)}}{c^4x^8+4\,bc^3x^7+2\left(3\,b^2c^2+2\,ac^3\right)x^6+4\left(b^3c+3\,abc^2\right)x^5+4\,a^3bx+\left(b^4+12\,ab^2c+6\,a^2c^2\right)x^4+a^4+\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^(7/2),x, algorithm="fric
as")
```

```
[Out] integral(sqrt(c*x^2 + b*x + a)*(2*c*x + b)*e^(c*x^2 + b*x + a)/(c^4*x^8 + 4
*b*c^3*x^7 + 2*(3*b^2*c^2 + 2*a*c^3)*x^6 + 4*(b^3*c + 3*a*b*c^2)*x^5 + 4*a^
3*b*x + (b^4 + 12*a*b^2*c + 6*a^2*c^2)*x^4 + a^4 + 4*(a*b^3 + 3*a^2*b*c)*x^
3 + 2*(3*a^2*b^2 + 2*a^3*c)*x^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(2\,cx+b)e^{\left(cx^2+bx+a\right)}}{\left(cx^2+bx+a\right)^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^(7/2),x, algorithm="giac
")
```

```
[Out] integrate((2*c*x + b)*e^(c*x^2 + b*x + a)/(c*x^2 + b*x + a)^(7/2), x)
```

maple [A] time = 0.03, size = 95, normalized size = 0.83

$$\frac{8\sqrt{\pi}\;\operatorname{erfi}\left(\sqrt{c\,x^2+bx+a}\right)}{15}-\frac{2\,\mathrm{e}^{c\,x^2+bx+a}}{5\left(c\,x^2+bx+a\right)^{\frac{5}{2}}}-\frac{4\,\mathrm{e}^{c\,x^2+bx+a}}{15\left(c\,x^2+bx+a\right)^{\frac{3}{2}}}-\frac{8\,\mathrm{e}^{c\,x^2+bx+a}}{15\sqrt{c\,x^2+bx+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^(7/2),x)
```

```
[Out] -2/5*exp(c*x^2+b*x+a)/(c*x^2+b*x+a)^(5/2)-4/15/(c*x^2+b*x+a)^(3/2)*exp(c*x^
2+b*x+a)+8/15*erfi((c*x^2+b*x+a)^(1/2))*Pi^(1/2)-8/15/(c*x^2+b*x+a)^(1/2)*e
xp(c*x^2+b*x+a)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(2\,cx+b)e^{\left(cx^2+bx+a\right)}}{\left(cx^2+bx+a\right)^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^(7/2),x, algorithm="maxi
ma")
```

```
[Out] integrate((2*c*x + b)*e^(c*x^2 + b*x + a)/(c*x^2 + b*x + a)^(7/2), x)
```

mupad [B] time = 4.66, size = 129, normalized size = 1.12

$$-\frac{e^{c\,x^2+b\,x+a}\,\left(6\,c\,x^2+6\,b\,x+6\,a\right)+4\,e^{c\,x^2+b\,x+a}\,{\left(c\,x^2+b\,x+a\right)}^2+8\,e^{c\,x^2+b\,x+a}\,{\left(c\,x^2+b\,x+a\right)}^3+8\,\sqrt{\pi}\,\mathrm{erfc}\left(\sqrt{-c\,}\right.}{15\,{\left(c\,x^2+b\,x+a\right)}^{7/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(a + b*x + c*x^2)*(b + 2*c*x))/(a + b*x + c*x^2)^(7/2),x)
```

```
[Out] -(exp(a + b*x + c*x^2)*(6*a + 6*b*x + 6*c*x^2) + 4*exp(a + b*x + c*x^2)*(a
+ b*x + c*x^2)^2 + 8*exp(a + b*x + c*x^2)*(a + b*x + c*x^2)^3 + 8*pi^(1/2)*
erfc((- a - b*x - c*x^2)^(1/2))*(- a - b*x - c*x^2)^(7/2))/(15*(a + b*x + c
*x^2)^(7/2))
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x**2+b*x+a)*(2*c*x+b)/(c*x**2+b*x+a)**(7/2),x)
```

```
[Out] Timed out
```

3.635 $\int \frac{e^{a+bx+cx^2}(b+2cx)}{(a+bx+cx^2)^{9/2}} \, dx$

Optimal. Leaf size=145

$$\frac{16}{105}\sqrt{\pi}\,\mathrm{erfi}\left(\sqrt{a+bx+cx^2}\right)-\frac{16e^{a+bx+cx^2}}{105\sqrt{a+bx+cx^2}}-\frac{8e^{a+bx+cx^2}}{105\left(a+bx+cx^2\right)^{3/2}}-\frac{4e^{a+bx+cx^2}}{35\left(a+bx+cx^2\right)^{5/2}}-\frac{2e^{a+bx+cx^2}}{7\left(a+bx+cx^2\right)}$$

```
[Out] -2/7*exp(c*x^2+b*x+a)/(c*x^2+b*x+a)^(7/2)-4/35*exp(c*x^2+b*x+a)/(c*x^2+b*x+
a)^(5/2)-8/105*exp(c*x^2+b*x+a)/(c*x^2+b*x+a)^(3/2)+16/105*erfi((c*x^2+b*x+
a)^(1/2))*Pi^(1/2)-16/105*exp(c*x^2+b*x+a)/(c*x^2+b*x+a)^(1/2)
```

Rubi [A] time = 0.38, antiderivative size = 145, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 4, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.121, Rules used = {6707, 2177, 2180, 2204}

$$\frac{16}{105}\sqrt{\pi}\,\mathrm{Erfi}\left(\sqrt{a+bx+cx^2}\right)-\frac{16e^{a+bx+cx^2}}{105\sqrt{a+bx+cx^2}}-\frac{8e^{a+bx+cx^2}}{105\left(a+bx+cx^2\right)^{3/2}}-\frac{4e^{a+bx+cx^2}}{35\left(a+bx+cx^2\right)^{5/2}}-\frac{2e^{a+bx+cx^2}}{7\left(a+bx+cx^2\right)}$$

Antiderivative was successfully verified.

```
[In] Int[(E^(a + b*x + c*x^2)*(b + 2*c*x))/(a + b*x + c*x^2)^(9/2),x]
```

```
[Out] (-2*E^(a + b*x + c*x^2))/(7*(a + b*x + c*x^2)^(7/2)) - (4*E^(a + b*x + c*x^
2))/(35*(a + b*x + c*x^2)^(5/2)) - (8*E^(a + b*x + c*x^2))/(105*(a + b*x +
c*x^2)^(3/2)) - (16*E^(a + b*x + c*x^2))/(105*Sqrt[a + b*x + c*x^2]) + (16*
Sqrt[Pi]*Erfi[Sqrt[a + b*x + c*x^2]])/105
```

Rule 2177

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_), x_Symbol] :> Simp[((c + d*x)^(m + 1)*(b*F^(g*(e + f*x)))^n)/(d*(m + 1))
, x] - Dist[(f*g*n*Log[F])/(d*(m + 1)), Int[(c + d*x)^(m + 1)*(b*F^(g*(e +
f*x)))^n, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && LtQ[m, -1] && Int
egerQ[2*m] &&  !$UseGamma === True
```

Rule 2180

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :
> Dist[2/d, Subst[Int[F^(g*(e - (c*f)/d) + (f*g*x^2)/d), x], x, Sqrt[c + d*
x]], x] /; FreeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 6707

```
Int[(F_)^(v_)*(u_)*(w_)^(m_.), x_Symbol] :> With[{q = DerivativeDivides[v,
u, x]}, Dist[q, Subst[Int[x^m*F^x, x], x, v], x] /;  !FalseQ[q]] /; FreeQ[{
F, m}, x] && EqQ[w, v]
```

Rubi steps

$$\int \frac{e^{a+bx+cx^2}(b+2cx)}{\left(a+bx+cx^2\right)^{9/2}}\,dx = \text{Subst}\left(\int \frac{e^x}{x^{9/2}}\,dx, x, a+bx+cx^2\right)$$

$$= -\frac{2e^{a+bx+cx^2}}{7\left(a+bx+cx^2\right)^{7/2}} + \frac{2}{7}\text{Subst}\left(\int \frac{e^x}{x^{7/2}}\,dx, x, a+bx+cx^2\right)$$

$$= -\frac{2e^{a+bx+cx^2}}{7\left(a+bx+cx^2\right)^{7/2}} - \frac{4e^{a+bx+cx^2}}{35\left(a+bx+cx^2\right)^{5/2}} + \frac{4}{35}\text{Subst}\left(\int \frac{e^x}{x^{5/2}}\,dx, x, a+bx+cx^2\right)$$

$$= -\frac{2e^{a+bx+cx^2}}{7\left(a+bx+cx^2\right)^{7/2}} - \frac{4e^{a+bx+cx^2}}{35\left(a+bx+cx^2\right)^{5/2}} - \frac{8e^{a+bx+cx^2}}{105\left(a+bx+cx^2\right)^{3/2}} + \frac{8}{105}\text{Subst}\left(\int \right.$$

$$= -\frac{2e^{a+bx+cx^2}}{7\left(a+bx+cx^2\right)^{7/2}} - \frac{4e^{a+bx+cx^2}}{35\left(a+bx+cx^2\right)^{5/2}} - \frac{8e^{a+bx+cx^2}}{105\left(a+bx+cx^2\right)^{3/2}} - \frac{16e^{a+bx+cx^2}}{105\sqrt{a+bx+c}}$$

$$= -\frac{2e^{a+bx+cx^2}}{7\left(a+bx+cx^2\right)^{7/2}} - \frac{4e^{a+bx+cx^2}}{35\left(a+bx+cx^2\right)^{5/2}} - \frac{8e^{a+bx+cx^2}}{105\left(a+bx+cx^2\right)^{3/2}} - \frac{16e^{a+bx+cx^2}}{105\sqrt{a+bx+c}}$$

$$= -\frac{2e^{a+bx+cx^2}}{7\left(a+bx+cx^2\right)^{7/2}} - \frac{4e^{a+bx+cx^2}}{35\left(a+bx+cx^2\right)^{5/2}} - \frac{8e^{a+bx+cx^2}}{105\left(a+bx+cx^2\right)^{3/2}} - \frac{16e^{a+bx+cx^2}}{105\sqrt{a+bx+c}}$$

Mathematica [A] time = 0.24, size = 103, normalized size = 0.71

$$-\frac{2\left(e^{a+x(b+cx)}\left(8(a+x(b+cx))^3+4(a+x(b+cx))^2+6(a+x(b+cx))+15\right)+8(-a-x(b+cx))^{7/2}\Gamma\left(\frac{1}{2},-a-x(b\right.\right.}{105(a+x(b+cx))^{7/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^(a + b*x + c*x^2)*(b + 2*c*x))/(a + b*x + c*x^2)^(9/2),x]
```

```
[Out] (-2*(E^(a + x*(b + c*x))*(15 + 6*(a + x*(b + c*x)) + 4*(a + x*(b + c*x))^2
+ 8*(a + x*(b + c*x))^3) + 8*(-a - x*(b + c*x))^(7/2)*Gamma[1/2, -a - x*(b
+ c*x)]))/(105*(a + x*(b + c*x))^(7/2))
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{cx^2+bx+a}}{c^5x^{10}+5\,bc^4x^9+5\left(2\,b^2c^3+ac^4\right)x^8+10\left(b^3c^2+2\,abc^3\right)x^7+5\left(b^4c+6\,ab^2c^2+2\,a^2c^3\right)x^6+5\,a^4bx+\left(\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^(9/2),x, algorithm="fric
as")
```

```
[Out] integral(sqrt(c*x^2 + b*x + a)*(2*c*x + b)*e^(c*x^2 + b*x + a)/(c^5*x^10 +
5*b*c^4*x^9 + 5*(2*b^2*c^3 + a*c^4)*x^8 + 10*(b^3*c^2 + 2*a*b*c^3)*x^7 + 5*
(b^4*c + 6*a*b^2*c^2 + 2*a^2*c^3)*x^6 + 5*a^4*b*x + (b^5 + 20*a*b^3*c + 30*
a^2*b*c^2)*x^5 + a^5 + 5*(a*b^4 + 6*a^2*b^2*c + 2*a^3*c^2)*x^4 + 10*(a^2*b^
3 + 2*a^3*b*c)*x^3 + 5*(2*a^3*b^2 + a^4*c)*x^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(2\,cx+b)e^{\left(cx^2+bx+a\right)}}{\left(cx^2+bx+a\right)^{\frac{9}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^(9/2),x, algorithm="giac
")
```

```
[Out] integrate((2*c*x + b)*e^(c*x^2 + b*x + a)/(c*x^2 + b*x + a)^(9/2), x)
```

maple [A] time = 0.04, size = 120, normalized size = 0.83

$$\frac{16\sqrt{\pi}\;\operatorname{erfi}\left(\sqrt{c\,x^2+bx+a}\right)}{105}-\frac{2\,e^{c\,x^2+bx+a}}{7\left(c\,x^2+bx+a\right)^{\frac{7}{2}}}-\frac{4\,e^{c\,x^2+bx+a}}{35\left(c\,x^2+bx+a\right)^{\frac{5}{2}}}-\frac{8\,e^{c\,x^2+bx+a}}{105\left(c\,x^2+bx+a\right)^{\frac{3}{2}}}-\frac{16\,e^{c\,x^2+bx+a}}{105\sqrt{c\,x^2+bx+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^(9/2),x)
```

[Out] -2/7*exp(c*x^2+b*x+a)/(c*x^2+b*x+a)^(7/2)-4/35/(c*x^2+b*x+a)^(5/2)*exp(c*x^2+b*x+a)-8/105/(c*x^2+b*x+a)^(3/2)*exp(c*x^2+b*x+a)+16/105*erfi((c*x^2+b*x+a)^(1/2))*Pi^(1/2)-16/105/(c*x^2+b*x+a)^(1/2)*exp(c*x^2+b*x+a)

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(2\,cx+b)e^{\left(cx^2+bx+a\right)}}{\left(cx^2+bx+a\right)^{\frac{9}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(exp(c*x^2+b*x+a)*(2*c*x+b)/(c*x^2+b*x+a)^(9/2),x, algorithm="maxima")

[Out] integrate((2*c*x + b)*e^(c*x^2 + b*x + a)/(c*x^2 + b*x + a)^(9/2), x)

mupad [B] time = 5.70, size = 154, normalized size = 1.06

$$-\frac{e^{c\,x^2+b\,x+a}\,\left(30\,c\,x^2+30\,b\,x+30\,a\right)+12\,e^{c\,x^2+b\,x+a}\,{\left(c\,x^2+b\,x+a\right)}^2+8\,e^{c\,x^2+b\,x+a}\,{\left(c\,x^2+b\,x+a\right)}^3+16\,e^{c\,x^2+b\,x+a}}{105\,{\left(c\,x^2+b\,x+a\right)}^{9/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((exp(a + b*x + c*x^2)*(b + 2*c*x))/(a + b*x + c*x^2)^(9/2),x)

[Out] -(exp(a + b*x + c*x^2)*(30*a + 30*b*x + 30*c*x^2) + 12*exp(a + b*x + c*x^2)*(a + b*x + c*x^2)^2 + 8*exp(a + b*x + c*x^2)*(a + b*x + c*x^2)^3 + 16*exp(a + b*x + c*x^2)*(a + b*x + c*x^2)^4 - 16*pi^(1/2)*erfc((- a - b*x - c*x^2)^(1/2))*(- a - b*x - c*x^2)^(9/2))/(105*(a + b*x + c*x^2)^(9/2))

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(exp(c*x**2+b*x+a)*(2*c*x+b)/(c*x**2+b*x+a)**(9/2),x)

[Out] Timed out

3.636 $\int \frac{e^{-x}}{\sqrt{1-e^{-2x}}}\,dx$

Optimal. Leaf size=8

$$-\sin^{-1}\left(e^{-x}\right)$$

```
[Out] -arcsin(exp(-x))
```

Rubi [A] time = 0.03, antiderivative size = 8, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105, Rules used = {2249, 216}

$$-\sin^{-1}\left(e^{-x}\right)$$

Antiderivative was successfully verified.

```
[In] Int[1/(E^x*Sqrt[1 - E^(-2*x)]),x]
```

```
[Out] -ArcSin[E^(-x)]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{e^{-x}}{\sqrt{1-e^{-2x}}}\,dx &= -\text{Subst}\left(\int \frac{1}{\sqrt{1-x^2}}\,dx, x, e^{-x}\right)\\ &= -\sin^{-1}\left(e^{-x}\right)\end{aligned}$$

Mathematica [B] time = 0.02, size = 42, normalized size = 5.25

$$\frac{e^{-x}\sqrt{e^{2x}-1}\,\tan^{-1}\left(\sqrt{e^{2x}-1}\right)}{\sqrt{1-e^{-2x}}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(E^x*Sqrt[1 - E^(-2*x)]),x]
```

```
[Out] (Sqrt[-1 + E^(2*x)]*ArcTan[Sqrt[-1 + E^(2*x)]])/(E^x*Sqrt[1 - E^(-2*x)])
```

fricas [B] time = 0.41, size = 18, normalized size = 2.25

$$2 \arctan\left(\left(\sqrt{-e^{(-2\,x)}+1}-1\right)e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/exp(x)/(1-1/exp(2*x))^(1/2),x, algorithm="fricas")
```

```
[Out] 2*arctan((sqrt(-e^(-2*x) + 1) - 1)*e^x)
```

giac [A] time = 0.20, size = 14, normalized size = 1.75

$$-\arctan(i)+\arctan\left(\sqrt{e^{(2\,x)}-1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/exp(x)/(1-1/exp(2*x))^(1/2),x, algorithm="giac")
```

```
[Out] -arctan(i) + arctan(sqrt(e^(2*x) - 1))
```

maple [B] time = 0.05, size = 37, normalized size = 4.62

$$-\frac{\sqrt{e^{2x}-1}\ \arctan\left(\frac{1}{\sqrt{e^{2x}-1}}\right)e^{-x}}{\sqrt{\left(e^{2x}-1\right)e^{-2x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/exp(x)/(1-1/exp(2*x))^(1/2),x)
```

```
[Out] -1/((exp(x)^2-1)/exp(x)^2)^(1/2)/exp(x)*(exp(x)^2-1)^(1/2)*arctan(1/(exp(x)
^2-1)^(1/2))
```

maxima [A] time = 2.29, size = 14, normalized size = 1.75

$$\arctan\left(\sqrt{-e^{(-2\,x)}+1}\,e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/exp(x)/(1-1/exp(2*x))^(1/2),x, algorithm="maxima")
```

```
[Out] arctan(sqrt(-e^(-2*x) + 1)*e^x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.12

$$\int \frac{e^{-x}}{\sqrt{1-e^{-2x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(-x)/(1 - exp(-2*x))^(1/2),x)
[Out] int(exp(-x)/(1 - exp(-2*x))^(1/2), x)
```

sympy [A] time = 0.99, size = 7, normalized size = 0.88

$$-\operatorname{asin}\left(e^{-x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/exp(x)/(1-1/exp(2*x))**(1/2),x)
[Out] -asin(exp(-x))
```

3.637 $\int \frac{e^x}{4+e^{2x}} \, dx$

Optimal. Leaf size=12

$$\frac{1}{2} \tan^{-1}\left(\frac{e^x}{2}\right)$$

```
[Out] 1/2*arctan(1/2*exp(x))
```

Rubi [A] time = 0.02, antiderivative size = 12, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2249, 203}

$$\frac{1}{2} \tan^{-1}\left(\frac{e^x}{2}\right)$$

Antiderivative was successfully verified.

```
[In] Int[E^x/(4 + E^(2*x)),x]
```

```
[Out] ArcTan[E^x/2]/2
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{e^x}{4+e^{2x}} \, dx &= \text{Subst}\left(\int \frac{1}{4+x^2} \, dx, x, e^x\right)\\ &= \frac{1}{2} \tan^{-1}\left(\frac{e^x}{2}\right)\end{aligned}$$

Mathematica [A] time = 0.00, size = 12, normalized size = 1.00

$$\frac{1}{2}\tan^{-1}\left(\frac{e^x}{2}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x/(4 + E^(2*x)),x]
```

```
[Out] ArcTan[E^x/2]/2
```

fricas [A] time = 0.38, size = 7, normalized size = 0.58

$$\frac{1}{2}\arctan\left(\frac{1}{2}e^x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(4+exp(2*x)),x, algorithm="fricas")
```

```
[Out] 1/2*arctan(1/2*e^x)
```

giac [A] time = 0.20, size = 7, normalized size = 0.58

$$\frac{1}{2}\arctan\left(\frac{1}{2}e^x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(4+exp(2*x)),x, algorithm="giac")
```

```
[Out] 1/2*arctan(1/2*e^x)
```

maple [A] time = 0.03, size = 8, normalized size = 0.67

$$\frac{\arctan\left(\frac{e^x}{2}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(4+exp(2*x)),x)
```

```
[Out] 1/2*arctan(1/2*exp(x))
```

maxima [A] time = 2.00, size = 7, normalized size = 0.58

$$\frac{1}{2}\arctan\left(\frac{1}{2}e^x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(4+exp(2*x)),x, algorithm="maxima")
```

```
[Out] 1/2*arctan(1/2*e^x)
```

mupad [B] time = 3.58, size = 7, normalized size = 0.58

$$\frac{\operatorname{atan}\left(\frac{e^x}{2}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(exp(2*x) + 4),x)
```

```
[Out] atan(exp(x)/2)/2
```

sympy [B] time = 0.11, size = 15, normalized size = 1.25

$$\operatorname{RootSum}\left(16z^2+1,\left(i\mapsto i\log\left(8i+e^x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(4+exp(2*x)),x)
```

```
[Out] RootSum(16*_z**2 + 1, Lambda(_i, _i*log(8*_i + exp(x))))
```

3.638 $\int \frac{e^x}{1-e^{2x}} dx$

Optimal. Leaf size=4

$$\tanh^{-1}(e^x)$$

[Out] arctanh(exp(x))

Rubi [A] time = 0.02, antiderivative size = 4, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {2249, 206}

$$\tanh^{-1}(e^x)$$

Antiderivative was successfully verified.

[In] Int[E^x/(1 - E^(2*x)),x]

[Out] ArcTanh[E^x]

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned} \int \frac{e^x}{1-e^{2x}} dx &= \text{Subst}\left(\int \frac{1}{1-x^2} dx, x, e^x\right) \\ &= \tanh^{-1}(e^x) \end{aligned}$$

Mathematica [A] time = 0.00, size = 4, normalized size = 1.00

$$\tanh^{-1}(e^x)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x/(1 - E^(2*x)),x]
```

```
[Out] ArcTanh[E^x]
```

fricas [B] time = 0.40, size = 15, normalized size = 3.75

$$\frac{1}{2}\,\log\left(e^{x}+1\right)-\frac{1}{2}\,\log\left(e^{x}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1-exp(2*x)),x, algorithm="fricas")
```

```
[Out] 1/2*log(e^x + 1) - 1/2*log(e^x - 1)
```

giac [B] time = 0.21, size = 16, normalized size = 4.00

$$\frac{1}{2}\,\log\left(e^{x}+1\right)-\frac{1}{2}\,\log\left(|e^{x}-1|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1-exp(2*x)),x, algorithm="giac")
```

```
[Out] 1/2*log(e^x + 1) - 1/2*log(abs(e^x - 1))
```

maple [A] time = 0.03, size = 4, normalized size = 1.00

$$\operatorname{arctanh}\left(\mathrm{e}^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(1-exp(2*x)),x)
```

```
[Out] arctanh(exp(x))
```

maxima [B] time = 1.37, size = 15, normalized size = 3.75

$$\frac{1}{2}\,\log\left(e^{x}+1\right)-\frac{1}{2}\,\log\left(e^{x}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1-exp(2*x)),x, algorithm="maxima")
```

```
[Out] 1/2*log(e^x + 1) - 1/2*log(e^x - 1)
```

mupad [B] time = 0.13, size = 15, normalized size = 3.75

$$\frac{\ln\left(\mathrm{e}^x+1\right)}{2}-\frac{\ln\left(\mathrm{e}^x-1\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-exp(x)/(exp(2*x) - 1),x)
[Out] log(exp(x) + 1)/2 - log(exp(x) - 1)/2
```

sympy [B] time = 0.11, size = 15, normalized size = 3.75

$$-\frac{\log\left(e^x-1\right)}{2}+\frac{\log\left(e^x+1\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1-exp(2*x)),x)
[Out] -log(exp(x) - 1)/2 + log(exp(x) + 1)/2
```

3.639 $\int \frac{e^x}{3-4e^{2x}} \, dx$

Optimal. Leaf size=20

$$\frac{\tanh^{-1}\left(\frac{2e^x}{\sqrt{3}}\right)}{2\sqrt{3}}$$

```
[Out] 1/6*arctanh(2/3*exp(x)*3^(1/2))*3^(1/2)
```

Rubi [A] time = 0.02, antiderivative size = 20, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {2249, 206}

$$\frac{\tanh^{-1}\left(\frac{2e^x}{\sqrt{3}}\right)}{2\sqrt{3}}$$

Antiderivative was successfully verified.

```
[In] Int[E^x/(3 - 4*E^(2*x)),x]
```

```
[Out] ArcTanh[(2*E^x)/Sqrt[3]]/(2*Sqrt[3])
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\int \frac{e^x}{3-4e^{2x}}\,dx = \text{Subst}\left(\int \frac{1}{3-4x^2}\,dx, x, e^x\right)$$
$$= \frac{\tanh^{-1}\left(\frac{2e^x}{\sqrt{3}}\right)}{2\sqrt{3}}$$

Mathematica [A] time = 0.01, size = 20, normalized size = 1.00

$$\frac{\tanh^{-1}\left(\frac{2e^x}{\sqrt{3}}\right)}{2\sqrt{3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x/(3 - 4*E^(2*x)),x]
[Out] ArcTanh[(2*E^x)/Sqrt[3]]/(2*Sqrt[3])
```

fricas [B] time = 0.41, size = 32, normalized size = 1.60

$$\frac{1}{12}\sqrt{3}\log\left(\frac{4\sqrt{3}e^x + 4e^{(2x)} + 3}{4e^{(2x)} - 3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(3-4*exp(2*x)),x, algorithm="fricas")
[Out] 1/12*sqrt(3)*log((4*sqrt(3)*e^x + 4*e^(2*x) + 3)/(4*e^(2*x) - 3))
```

giac [B] time = 0.21, size = 30, normalized size = 1.50

$$\frac{1}{12}\sqrt{3}\log\left(\frac{1}{2}\sqrt{3} + e^x\right) - \frac{1}{12}\sqrt{3}\log\left(\left|-\frac{1}{2}\sqrt{3} + e^x\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(3-4*exp(2*x)),x, algorithm="giac")
[Out] 1/12*sqrt(3)*log(1/2*sqrt(3) + e^x) - 1/12*sqrt(3)*log(abs(-1/2*sqrt(3) + e
^x))
```

maple [A] time = 0.03, size = 14, normalized size = 0.70

$$\frac{\sqrt{3}\,\operatorname{arctanh}\left(\frac{2\sqrt{3}\,e^x}{3}\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(3-4*exp(2*x)),x)
```

```
[Out] 1/6*arctanh(2/3*exp(x)*3^(1/2))*3^(1/2)
```

maxima [A] time = 2.32, size = 26, normalized size = 1.30

$$-\frac{1}{12}\sqrt{3}\log\left(-\frac{\sqrt{3}-2e^{x}}{\sqrt{3}+2e^{x}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(3-4*exp(2*x)),x, algorithm="maxima")
```

```
[Out] -1/12*sqrt(3)*log(-(sqrt(3) - 2*e^x)/(sqrt(3) + 2*e^x))
```

mupad [B] time = 0.16, size = 13, normalized size = 0.65

$$\frac{\sqrt{3}\,\mathrm{atanh}\left(\frac{2\sqrt{3}\,\mathrm{e}^{x}}{3}\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-exp(x)/(4*exp(2*x) - 3),x)
```

```
[Out] (3^(1/2)*atanh((2*3^(1/2)*exp(x))/3))/6
```

sympy [A] time = 0.12, size = 15, normalized size = 0.75

$$\mathrm{RootSum}\left(48z^{2}-1,\left(i\mapsto i\log\left(6i+e^{x}\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(3-4*exp(2*x)),x)
```

```
[Out] RootSum(48*_z**2 - 1, Lambda(_i, _i*log(6*_i + exp(x))))
```

3.640 $\int e^x\sqrt{3-4e^{2x}}\,dx$

Optimal. Leaf size=36

$$\frac{1}{2}e^x\sqrt{3-4e^{2x}}+\frac{3}{4}\sin^{-1}\left(\frac{2e^x}{\sqrt{3}}\right)$$

```
[Out] 3/4*arcsin(2/3*exp(x)*3^(1/2))+1/2*exp(x)*(3-4*exp(2*x))^(1/2)
```

Rubi [A] time = 0.03, antiderivative size = 36, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.176, Rules used = {2249, 195, 216}

$$\frac{1}{2}e^x\sqrt{3-4e^{2x}}+\frac{3}{4}\sin^{-1}\left(\frac{2e^x}{\sqrt{3}}\right)$$

Antiderivative was successfully verified.

```
[In] Int[E^x*Sqrt[3 - 4*E^(2*x)],x]
```

```
[Out] (E^x*Sqrt[3 - 4*E^(2*x)])/2 + (3*ArcSin[(2*E^x)/Sqrt[3]])/4
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\int e^x\sqrt{3-4e^{2x}}\,dx = \text{Subst}\left(\int \sqrt{3-4x^2}\,dx, x, e^x\right)$$
$$= \frac{1}{2}e^x\sqrt{3-4e^{2x}} + \frac{3}{2}\text{Subst}\left(\int \frac{1}{\sqrt{3-4x^2}}\,dx, x, e^x\right)$$
$$= \frac{1}{2}e^x\sqrt{3-4e^{2x}} + \frac{3}{4}\sin^{-1}\left(\frac{2e^x}{\sqrt{3}}\right)$$

Mathematica [**A**] time = 0.02, size = 36, normalized size = 1.00

$$\frac{1}{4}\left(2e^x\sqrt{3-4e^{2x}} + 3\sin^{-1}\left(\frac{2e^x}{\sqrt{3}}\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x*Sqrt[3 - 4*E^(2*x)],x]
```

```
[Out] (2*E^x*Sqrt[3 - 4*E^(2*x)] + 3*ArcSin[(2*E^x)/Sqrt[3]])/4
```

fricas [**A**] time = 0.41, size = 34, normalized size = 0.94

$$\frac{1}{2}\sqrt{-4\,e^{(2\,x)}+3}\,e^x - \frac{3}{4}\arctan\left(\frac{1}{2}\sqrt{-4\,e^{(2\,x)}+3}\,e^{(-x)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(3-4*exp(2*x))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/2*sqrt(-4*e^(2*x) + 3)*e^x - 3/4*arctan(1/2*sqrt(-4*e^(2*x) + 3)*e^(-x))
```

giac [**A**] time = 0.20, size = 25, normalized size = 0.69

$$\frac{1}{2}\sqrt{-4\,e^{(2\,x)}+3}\,e^x + \frac{3}{4}\arcsin\left(\frac{2}{3}\sqrt{3}\,e^x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(3-4*exp(2*x))^(1/2),x, algorithm="giac")
```

```
[Out] 1/2*sqrt(-4*e^(2*x) + 3)*e^x + 3/4*arcsin(2/3*sqrt(3)*e^x)
```

maple [**A**] time = 0.04, size = 26, normalized size = 0.72

$$\frac{3\arcsin\left(\frac{2\sqrt{3}\,e^x}{3}\right)}{4} + \frac{\sqrt{-4\,e^{2x}+3}\,e^x}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*(3-4*exp(2*x))^(1/2),x)
```

```
[Out] 1/2*exp(x)*(3-4*exp(x)^2)^(1/2)+3/4*arcsin(2/3*3^(1/2)*exp(x))
```

maxima [A] time = 2.08, size = 25, normalized size = 0.69

$$\frac{1}{2}\sqrt{-4\,e^{(2\,x)}+3}\,e^{x}+\frac{3}{4}\,\arcsin\left(\frac{2}{3}\,\sqrt{3}\,e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(3-4*exp(2*x))^(1/2),x, algorithm="maxima")
```

```
[Out] 1/2*sqrt(-4*e^(2*x) + 3)*e^x + 3/4*arcsin(2/3*sqrt(3)*e^x)
```

mupad [B] time = 0.09, size = 24, normalized size = 0.67

$$\frac{3\,\mathrm{asin}\left(\frac{2\,\sqrt{3}\,\mathrm{e}^{x}}{3}\right)}{4}+\mathrm{e}^{x}\,\sqrt{\frac{3}{4}-\mathrm{e}^{2\,x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*(3 - 4*exp(2*x))^(1/2),x)
```

```
[Out] (3*asin((2*3^(1/2)*exp(x))/3))/4 + exp(x)*(3/4 - exp(2*x))^(1/2)
```

sympy [A] time = 1.56, size = 42, normalized size = 1.17

$$\begin{cases} \frac{\sqrt{3-4e^{2x}}\,e^{x}}{2}+\frac{3\,\mathrm{asin}\left(\frac{2\sqrt{3}e^{x}}{3}\right)}{4} & \text{for}\ e^{x}<\log\left(\frac{\sqrt{3}}{2}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(3-4*exp(2*x))**(1/2),x)
```

```
[Out] Piecewise((sqrt(3 - 4*exp(2*x))*exp(x)/2 + 3*asin(2*sqrt(3)*exp(x)/3)/4, ex
p(x) < log(sqrt(3)/2)))
```

3.641 $\int e^{x^2} x^3 \, dx$

Optimal. Leaf size=22

$$\frac{1}{2}e^{x^2}x^2 - \frac{e^{x^2}}{2}$$

[Out] -1/2*exp(x^2)+1/2*exp(x^2)*x^2

Rubi [A] time = 0.02, antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {2212, 2209}

$$\frac{1}{2}e^{x^2}x^2 - \frac{e^{x^2}}{2}$$

Antiderivative was successfully verified.

[In] Int[E^x^2*x^3,x]

[Out] -E^x^2/2 + (E^x^2*x^2)/2

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rubi steps

$$\begin{aligned}\int e^{x^2} x^3 \, dx &= \frac{1}{2}e^{x^2}x^2 - \int e^{x^2} x \, dx \\ &= -\frac{e^{x^2}}{2} + \frac{1}{2}e^{x^2}x^2\end{aligned}$$

Mathematica [A] time = 0.00, size = 14, normalized size = 0.64

$$\frac{1}{2}e^{x^2}\left(x^2-1\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x^2*x^3,x]
[Out] (E^x^2*(-1 + x^2))/2
```

fricas [A] time = 0.40, size = 11, normalized size = 0.50

$$\frac{1}{2}\left(x^2-1\right)e^{\left(x^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^2)*x^3,x, algorithm="fricas")
[Out] 1/2*(x^2 - 1)*e^(x^2)
```

giac [A] time = 0.21, size = 11, normalized size = 0.50

$$\frac{1}{2}\left(x^2-1\right)e^{\left(x^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^2)*x^3,x, algorithm="giac")
[Out] 1/2*(x^2 - 1)*e^(x^2)
```

maple [A] time = 0.02, size = 12, normalized size = 0.55

$$\frac{\left(x^2-1\right)\mathrm{e}^{x^2}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x^2)*x^3,x)
[Out] 1/2*(x^2-1)*exp(x^2)
```

maxima [A] time = 0.77, size = 11, normalized size = 0.50

$$\frac{1}{2}\left(x^2-1\right)e^{\left(x^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^2)*x^3,x, algorithm="maxima")
```

```
[Out] 1/2*(x^2 - 1)*e^(x^2)
```

mupad [B] time = 0.04, size = 11, normalized size = 0.50

$$\frac{e^{x^2}\left(x^2-1\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*exp(x^2),x)
```

```
[Out] (exp(x^2)*(x^2 - 1))/2
```

sympy [A] time = 0.09, size = 10, normalized size = 0.45

$$\frac{\left(x^2-1\right)e^{x^2}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x**2)*x**3,x)
```

```
[Out] (x**2 - 1)*exp(x**2)/2
```

3.642 $\int e^x\sqrt{1-e^{2x}}\,dx$

Optimal. Leaf size=29

$$\frac{1}{2}e^x\sqrt{1-e^{2x}}+\frac{1}{2}\sin^{-1}(e^x)$$

```
[Out] 1/2*arcsin(exp(x))+1/2*exp(x)*(1-exp(2*x))^(1/2)
```

Rubi [A] time = 0.03, antiderivative size = 29, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.176, Rules used = {2249, 195, 216}

$$\frac{1}{2}e^x\sqrt{1-e^{2x}}+\frac{1}{2}\sin^{-1}(e^x)$$

Antiderivative was successfully verified.

```
[In] Int[E^x*Sqrt[1 - E^(2*x)],x]
```

```
[Out] (E^x*Sqrt[1 - E^(2*x)])/2 + ArcSin[E^x]/2
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\int e^x\sqrt{1-e^{2x}}\,dx = \text{Subst}\left(\int \sqrt{1-x^2}\,dx, x, e^x\right)$$
$$= \frac{1}{2}e^x\sqrt{1-e^{2x}} + \frac{1}{2}\text{Subst}\left(\int \frac{1}{\sqrt{1-x^2}}\,dx, x, e^x\right)$$
$$= \frac{1}{2}e^x\sqrt{1-e^{2x}} + \frac{1}{2}\sin^{-1}(e^x)$$

Mathematica [A] time = 0.01, size = 26, normalized size = 0.90

$$\frac{1}{2}\left(e^x\sqrt{1-e^{2x}} + \sin^{-1}(e^x)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x*Sqrt[1 - E^(2*x)],x]
[Out] (E^x*Sqrt[1 - E^(2*x)] + ArcSin[E^x])/2
```

fricas [A] time = 0.41, size = 35, normalized size = 1.21

$$\frac{1}{2}\sqrt{-e^{(2x)}+1}\,e^x - \arctan\left(\left(\sqrt{-e^{(2x)}+1} - 1\right)e^{(-x)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(1-exp(2*x))^(1/2),x, algorithm="fricas")
[Out] 1/2*sqrt(-e^(2*x) + 1)*e^x - arctan((sqrt(-e^(2*x) + 1) - 1)*e^(-x))
```

giac [A] time = 0.22, size = 20, normalized size = 0.69

$$\frac{1}{2}\sqrt{-e^{(2x)}+1}\,e^x + \frac{1}{2}\arcsin(e^x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(1-exp(2*x))^(1/2),x, algorithm="giac")
[Out] 1/2*sqrt(-e^(2*x) + 1)*e^x + 1/2*arcsin(e^x)
```

maple [A] time = 0.04, size = 21, normalized size = 0.72

$$\frac{\arcsin(\mathrm{e}^x)}{2} + \frac{\sqrt{-\mathrm{e}^{2x}+1}\;\mathrm{e}^x}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*(1-exp(2*x))^(1/2),x)
```

```
[Out] 1/2*exp(x)*(1-exp(x)^2)^(1/2)+1/2*arcsin(exp(x))
```

maxima [A] time = 1.77, size = 20, normalized size = 0.69

$$\frac{1}{2}\sqrt{-e^{(2x)}+1}\,e^{x}+\frac{1}{2}\arcsin\left(e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(1-exp(2*x))^(1/2),x, algorithm="maxima")
```

```
[Out] 1/2*sqrt(-e^(2*x) + 1)*e^x + 1/2*arcsin(e^x)
```

mupad [B] time = 3.35, size = 20, normalized size = 0.69

$$\frac{\mathrm{asin}\left(\mathrm{e}^{x}\right)}{2}+\frac{\mathrm{e}^{x}\sqrt{1-\mathrm{e}^{2x}}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*(1 - exp(2*x))^(1/2),x)
```

```
[Out] asin(exp(x))/2 + (exp(x)*(1 - exp(2*x))^(1/2))/2
```

sympy [A] time = 1.35, size = 24, normalized size = 0.83

$$\begin{cases} \frac{\sqrt{1-e^{2x}}\,e^{x}}{2}+\frac{\mathrm{asin}\left(e^{x}\right)}{2} & \text{for}\ e^{x}<0 \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(1-exp(2*x))**(1/2),x)
```

```
[Out] Piecewise((sqrt(1 - exp(2*x))*exp(x)/2 + asin(exp(x))/2, exp(x) < 0))
```

3.643 $\int \frac{e^x}{\sqrt{1+e^x+e^{2x}}}\,dx$

Optimal. Leaf size=14

$$\sinh^{-1}\left(\frac{2e^x+1}{\sqrt{3}}\right)$$

```
[Out] arcsinh(1/3*(1+2*exp(x))*3^(1/2))
```

Rubi [A] time = 0.04, antiderivative size = 14, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {2282, 619, 215}

$$\sinh^{-1}\left(\frac{2e^x+1}{\sqrt{3}}\right)$$

Antiderivative was successfully verified.

```
[In] Int[E^x/Sqrt[1 + E^x + E^(2*x)],x]
```

```
[Out] ArcSinh[(1 + 2*E^x)/Sqrt[3]]
```

Rule 215

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSinh[(Rt[b, 2]*x)/Sqr
t[a]]/Rt[b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && PosQ[b]
```

Rule 619

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Dist[1/(2*c*((-4
*c)/(b^2 - 4*a*c))^p), Subst[Int[Simp[1 - x^2/(b^2 - 4*a*c), x]^p, x], x, b
 + 2*c*x], x] /; FreeQ[{a, b, c, p}, x] && GtQ[4*a - b^2/c, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\int \frac{e^x}{\sqrt{1+e^x+e^{2x}}}\,dx = \text{Subst}\left(\int \frac{1}{\sqrt{1+x+x^2}}\,dx, x, e^x\right)$$
$$= \frac{\text{Subst}\left(\int \frac{1}{\sqrt{1+\frac{x^2}{3}}}\,dx, x, 1+2e^x\right)}{\sqrt{3}}$$
$$= \sinh^{-1}\left(\frac{1+2e^x}{\sqrt{3}}\right)$$

Mathematica [A] time = 0.01, size = 14, normalized size = 1.00

$$\sinh^{-1}\left(\frac{2e^x+1}{\sqrt{3}}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x/Sqrt[1 + E^x + E^(2*x)],x]
[Out] ArcSinh[(1 + 2*E^x)/Sqrt[3]]
```

fricas [A] time = 0.40, size = 21, normalized size = 1.50

$$-\log\left(2\sqrt{e^{(2x)}+e^x+1}-2e^x-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1+exp(x)+exp(2*x))^(1/2),x, algorithm="fricas")
[Out] -log(2*sqrt(e^(2*x) + e^x + 1) - 2*e^x - 1)
```

giac [A] time = 0.23, size = 21, normalized size = 1.50

$$-\log\left(2\sqrt{e^{(2x)}+e^x+1}-2e^x-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1+exp(x)+exp(2*x))^(1/2),x, algorithm="giac")
[Out] -log(2*sqrt(e^(2*x) + e^x + 1) - 2*e^x - 1)
```

maple [A] time = 0.04, size = 11, normalized size = 0.79

$$\operatorname{arcsinh}\left(\frac{2\sqrt{3}\,\left({\mathrm e}^{x}+\frac{1}{2}\right)}{3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(1+exp(x)+exp(2*x))^(1/2),x)
[Out] arcsinh(2/3*3^(1/2)*(exp(x)+1/2))
```

maxima [A] time = 1.81, size = 12, normalized size = 0.86

$$\operatorname{arsinh}\left(\frac{1}{3}\,\sqrt{3}\,(2\,e^{x}+1)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1+exp(x)+exp(2*x))^(1/2),x, algorithm="maxima")
[Out] arcsinh(1/3*sqrt(3)*(2*e^x + 1))
```

mupad [B] time = 3.64, size = 15, normalized size = 1.07

$$\ln\left({\mathrm e}^{x}+\sqrt{{\mathrm e}^{2\,x}+{\mathrm e}^{x}+1}+\frac{1}{2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(exp(2*x) + exp(x) + 1)^(1/2),x)
[Out] log(exp(x) + (exp(2*x) + exp(x) + 1)^(1/2) + 1/2)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{x}}{\sqrt{e^{2x}+e^{x}+1}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1+exp(x)+exp(2*x))**(1/2),x)
[Out] Integral(exp(x)/sqrt(exp(2*x) + exp(x) + 1), x)
```

3.644 $\int \frac{e^x}{-4+e^{2x}}\,dx$

Optimal. Leaf size=12

$$-\frac{1}{2}\tanh^{-1}\left(\frac{e^x}{2}\right)$$

```
[Out] -1/2*arctanh(1/2*exp(x))
```

Rubi [A] time = 0.02, antiderivative size = 12, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2249, 207}

$$-\frac{1}{2}\tanh^{-1}\left(\frac{e^x}{2}\right)$$

Antiderivative was successfully verified.

```
[In] Int[E^x/(-4 + E^(2*x)),x]
```

```
[Out] -ArcTanh[E^x/2]/2
```

Rule 207

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTanh[(Rt[b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (LtQ[a
, 0] || GtQ[b, 0])
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{e^x}{-4+e^{2x}}\,dx &= \text{Subst}\left(\int \frac{1}{-4+x^2}\,dx, x, e^x\right)\\ &= -\frac{1}{2}\tanh^{-1}\left(\frac{e^x}{2}\right)\end{aligned}$$

Mathematica [**A**] time = 0.00, size = 12, normalized size = 1.00

$$-\frac{1}{2}\tanh^{-1}\left(\frac{e^x}{2}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x/(-4 + E^(2*x)),x]
[Out] -1/2*ArcTanh[E^x/2]
```

fricas [**B**] time = 0.40, size = 15, normalized size = 1.25

$$-\frac{1}{4}\log\left(e^x+2\right)+\frac{1}{4}\log\left(e^x-2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(-4+exp(2*x)),x, algorithm="fricas")
[Out] -1/4*log(e^x + 2) + 1/4*log(e^x - 2)
```

giac [**B**] time = 0.22, size = 16, normalized size = 1.33

$$-\frac{1}{4}\log\left(e^x+2\right)+\frac{1}{4}\log\left(|e^x-2|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(-4+exp(2*x)),x, algorithm="giac")
[Out] -1/4*log(e^x + 2) + 1/4*log(abs(e^x - 2))
```

maple [**B**] time = 0.04, size = 16, normalized size = 1.33

$$\frac{\ln\left(\mathrm{e}^x-2\right)}{4}-\frac{\ln\left(\mathrm{e}^x+2\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(-4+exp(2*x)),x)
[Out] 1/4*ln(-2+exp(x))-1/4*ln(exp(x)+2)
```

maxima [**B**] time = 0.93, size = 15, normalized size = 1.25

$$-\frac{1}{4}\log\left(e^x+2\right)+\frac{1}{4}\log\left(e^x-2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(-4+exp(2*x)),x, algorithm="maxima")
```

```
[Out] -1/4*log(e^x + 2) + 1/4*log(e^x - 2)
```

mupad [B] time = 0.14, size = 15, normalized size = 1.25

$$\frac{\ln\left(e^x-2\right)}{4}-\frac{\ln\left(e^x+2\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(exp(2*x) - 4),x)
```

```
[Out] log(exp(x) - 2)/4 - log(exp(x) + 2)/4
```

sympy [A] time = 0.11, size = 15, normalized size = 1.25

$$\frac{\log\left(e^{x}-2\right)}{4}-\frac{\log\left(e^{x}+2\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(-4+exp(2*x)),x)
```

```
[Out] log(exp(x) - 2)/4 - log(exp(x) + 2)/4
```

3.645 $\int e^{2-x^2} x \, dx$

Optimal. Leaf size=13

$$-\frac{1}{2}e^{2-x^2}$$

```
[Out] -1/2*exp(-x^2+2)
```

Rubi [A] time = 0.01, antiderivative size = 13, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {2209}

$$-\frac{1}{2}e^{2-x^2}$$

Antiderivative was successfully verified.

```
[In] Int[E^(2 - x^2)*x,x]
```

```
[Out] -E^(2 - x^2)/2
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rubi steps

$$\int e^{2-x^2} x \, dx = -\frac{1}{2}e^{2-x^2}$$

Mathematica [A] time = 0.00, size = 13, normalized size = 1.00

$$-\frac{1}{2}e^{2-x^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(2 - x^2)*x,x]
```

```
[Out] -1/2*E^(2 - x^2)
```

fricas [A] time = 0.40, size = 10, normalized size = 0.77

$$-\frac{1}{2} e^{\left(-x^2+2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-x^2+2)*x,x, algorithm="fricas")
[Out] -1/2*e^(-x^2 + 2)
```

giac [A] time = 0.21, size = 10, normalized size = 0.77

$$-\frac{1}{2}\, e^{\left(-x^2+2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-x^2+2)*x,x, algorithm="giac")
[Out] -1/2*e^(-x^2 + 2)
```

maple [A] time = 0.02, size = 11, normalized size = 0.85

$$-\frac{e^{-x^2+2}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(-x^2+2)*x,x)
[Out] -1/2*exp(-x^2+2)
```

maxima [A] time = 0.80, size = 10, normalized size = 0.77

$$-\frac{1}{2}\, e^{\left(-x^2+2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-x^2+2)*x,x, algorithm="maxima")
[Out] -1/2*e^(-x^2 + 2)
```

mupad [B] time = 0.06, size = 10, normalized size = 0.77

$$-\frac{e^2\, e^{-x^2}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*exp(2 - x^2),x)
[Out] -(exp(2)*exp(-x^2))/2
```

sympy [A] time = 0.09, size = 8, normalized size = 0.62

$$-\frac{e^{2-x^2}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(-x**2+2)*x,x)
```

```
[Out] -exp(2 - x**2)/2
```

3.646 $\int (e^x - x^e) \, dx$

Optimal. Leaf size=16

$$e^x - \frac{x^{1+e}}{1+e}$$

```
[Out] exp(x)-x^(1+E)/(1+E)
```

Rubi [A] time = 0.00, antiderivative size = 16, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 1, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2194}

$$e^x - \frac{x^{1+e}}{1+e}$$

Antiderivative was successfully verified.

```
[In] Int[E^x - x^E,x]
```

```
[Out] E^x - x^(1 + E)/(1 + E)
```

Rule 2194

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rubi steps

$$\begin{aligned} \int (e^x - x^e) \, dx &= -\frac{x^{1+e}}{1+e} + \int e^x \, dx \\ &= e^x - \frac{x^{1+e}}{1+e} \end{aligned}$$

Mathematica [A] time = 0.01, size = 16, normalized size = 1.00

$$e^x - \frac{x^{1+e}}{1+e}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x - x^E,x]
```

```
[Out] E^x - x^(1 + E)/(1 + E)
```

fricas [A] time = 0.39, size = 20, normalized size = 1.25

$$-\frac{xx^E - (E+1)e^x}{E+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)-x^E,x, algorithm="fricas")
[Out] -(x*x^E - (E + 1)*e^x)/(E + 1)
```

giac [A] time = 0.21, size = 15, normalized size = 0.94

$$-\frac{x^{E+1}}{E+1} + e^x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)-x^E,x, algorithm="giac")
[Out] -x^(E + 1)/(E + 1) + e^x
```

maple [A] time = 0.02, size = 16, normalized size = 1.00

$$-\frac{x^{E+1}}{E+1} + \mathrm{e}^x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)-x^E,x)
[Out] exp(x)-x^(1+E)/(1+E)
```

maxima [A] time = 0.81, size = 15, normalized size = 0.94

$$-\frac{x^{E+1}}{E+1} + e^x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)-x^E,x, algorithm="maxima")
[Out] -x^(E + 1)/(E + 1) + e^x
```

mupad [B] time = 3.33, size = 16, normalized size = 1.00

$$\mathrm{e}^x - \frac{x\,x^{\mathrm{e}}}{\mathrm{e}+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x) - x^exp(1),x)
```

```
[Out] exp(x) - (x*x^exp(1))/(exp(1) + 1)
```

sympy [A] time = 0.08, size = 14, normalized size = 0.88

$$-\frac{x^{1+e}}{1+e}+e^{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)-x**E,x)
```

```
[Out] -x**(1 + E)/(1 + E) + exp(x)
```

3.647 $\int \frac{-1+e^{2x}}{3+e^{2x}}\,dx$

Optimal. Leaf size=18

$$\frac{2}{3}\log\left(e^{2x}+3\right)-\frac{x}{3}$$

[Out] -1/3*x+2/3*ln(3+exp(2*x))

Rubi [A] time = 0.03, antiderivative size = 18, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118, Rules used = {2282, 72}

$$\frac{2}{3}\log\left(e^{2x}+3\right)-\frac{x}{3}$$

Antiderivative was successfully verified.

[In] Int[(-1 + E^(2*x))/(3 + E^(2*x)),x]

[Out] -x/3 + (2*Log[3 + E^(2*x)])/3

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}
\int \frac{-1+e^{2x}}{3+e^{2x}}\,dx &= \frac{1}{2}\operatorname{Subst}\left(\int \frac{-1+x}{x(3+x)}\,dx,x,e^{2x}\right)\\
&= \frac{1}{2}\operatorname{Subst}\left(\int \left(-\frac{1}{3x}+\frac{4}{3(3+x)}\right)dx,x,e^{2x}\right)\\
&= -\frac{x}{3}+\frac{2}{3}\log\left(3+e^{2x}\right)
\end{aligned}$$

Mathematica [A] time = 0.01, size = 18, normalized size = 1.00

$$\frac{2}{3}\log\left(e^{2x}+3\right)-\frac{x}{3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(-1 + E^(2*x))/(3 + E^(2*x)),x]
[Out] -1/3*x + (2*Log[3 + E^(2*x)])/3
```

fricas [A] time = 0.39, size = 13, normalized size = 0.72

$$-\frac{1}{3}x+\frac{2}{3}\log\left(e^{(2x)}+3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-1+exp(2*x))/(3+exp(2*x)),x, algorithm="fricas")
[Out] -1/3*x + 2/3*log(e^(2*x) + 3)
```

giac [A] time = 0.21, size = 13, normalized size = 0.72

$$-\frac{1}{3}x+\frac{2}{3}\log\left(e^{(2x)}+3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-1+exp(2*x))/(3+exp(2*x)),x, algorithm="giac")
[Out] -1/3*x + 2/3*log(e^(2*x) + 3)
```

maple [A] time = 0.03, size = 18, normalized size = 1.00

$$\frac{2\ln\left(e^{2x}+3\right)}{3}-\frac{\ln\left(e^{2x}\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(2*x)-1)/(3+exp(2*x)),x)
[Out] 2/3*ln(3+exp(2*x))-1/6*ln(exp(2*x))
```

maxima [A] time = 0.95, size = 13, normalized size = 0.72

$$-\frac{1}{3}x+\frac{2}{3}\log\left(e^{(2x)}+3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-1+exp(2*x))/(3+exp(2*x)),x, algorithm="maxima")
```

```
[Out] -1/3*x + 2/3*log(e^(2*x) + 3)
```

mupad [B] time = 0.08, size = 13, normalized size = 0.72

$$\frac{2\ln\left(e^{2x}+3\right)}{3}-\frac{x}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(2*x) - 1)/(exp(2*x) + 3),x)
```

```
[Out] (2*log(exp(2*x) + 3))/3 - x/3
```

sympy [A] time = 0.09, size = 14, normalized size = 0.78

$$-\frac{x}{3}+\frac{2\log\left(e^{2x}+3\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-1+exp(2*x))/(3+exp(2*x)),x)
```

```
[Out] -x/3 + 2*log(exp(2*x) + 3)/3
```

3.648 $\int \frac{e^x}{\sqrt{1-e^{2x}}}\,dx$

Optimal. Leaf size=4

$$\sin^{-1}(e^x)$$

```
[Out] arcsin(exp(x))
```

Rubi [A] time = 0.02, antiderivative size = 4, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118, Rules used = {2249, 216}

$$\sin^{-1}(e^x)$$

Antiderivative was successfully verified.

```
[In] Int[E^x/Sqrt[1 - E^(2*x)],x]
```

```
[Out] ArcSin[E^x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{e^x}{\sqrt{1-e^{2x}}}\,dx &= \text{Subst}\left(\int \frac{1}{\sqrt{1-x^2}}\,dx, x, e^x\right)\\ &= \sin^{-1}(e^x)\end{aligned}$$

Mathematica [A] time = 0.00, size = 4, normalized size = 1.00

$$\sin^{-1}(e^x)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x/Sqrt[1 - E^(2*x)],x]
```

```
[Out] ArcSin[E^x]
```

fricas [B] time = 0.41, size = 20, normalized size = 5.00

$$-2 \arctan\left(\left(\sqrt{-e^{(2x)}+1}-1\right)e^{(-x)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1-exp(2*x))^(1/2),x, algorithm="fricas")
```

```
[Out] -2*arctan((sqrt(-e^(2*x) + 1) - 1)*e^(-x))
```

giac [A] time = 0.22, size = 3, normalized size = 0.75

$$\arcsin\left(e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1-exp(2*x))^(1/2),x, algorithm="giac")
```

```
[Out] arcsin(e^x)
```

maple [A] time = 0.04, size = 4, normalized size = 1.00

$$\arcsin\left(\mathrm{e}^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(-exp(2*x)+1)^(1/2),x)
```

```
[Out] arcsin(exp(x))
```

maxima [A] time = 2.07, size = 3, normalized size = 0.75

$$\arcsin\left(e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1-exp(2*x))^(1/2),x, algorithm="maxima")
```

```
[Out] arcsin(e^x)
```

mupad [B] time = 3.53, size = 3, normalized size = 0.75

$$\mathrm{asin}\left(\mathrm{e}^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(1 - exp(2*x))^(1/2),x)
```

```
[Out] asin(exp(x))
```

sympy [A] time = 0.71, size = 3, normalized size = 0.75

$$\operatorname{asin}\left(e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1-exp(2*x))**(1/2),x)
```

```
[Out] asin(exp(x))
```

3.649 $\int \frac{e^{2x}}{1+e^{4x}}\,dx$

Optimal. Leaf size=10

$$\frac{1}{2}\tan^{-1}\left(e^{2x}\right)$$

```
[Out] 1/2*arctan(exp(2*x))
```

Rubi [A] time = 0.02, antiderivative size = 10, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {2249, 203}

$$\frac{1}{2}\tan^{-1}\left(e^{2x}\right)$$

Antiderivative was successfully verified.

```
[In] Int[E^(2*x)/(1 + E^(4*x)),x]
```

```
[Out] ArcTan[E^(2*x)]/2
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{e^{2x}}{1+e^{4x}}\,dx &= \frac{1}{2}\operatorname{Subst}\left(\int \frac{1}{1+x^2}\,dx, x, e^{2x}\right)\\ &= \frac{1}{2}\tan^{-1}\left(e^{2x}\right)\end{aligned}$$

Mathematica [A] time = 0.00, size = 10, normalized size = 1.00

$$\frac{1}{2}\tan^{-1}\left(e^{2x}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(2*x)/(1 + E^(4*x)),x]
```

```
[Out] ArcTan[E^(2*x)]/2
```

fricas [A] time = 0.39, size = 7, normalized size = 0.70

$$\frac{1}{2}\arctan\left(e^{(2x)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(1+exp(4*x)),x, algorithm="fricas")
```

```
[Out] 1/2*arctan(e^(2*x))
```

giac [A] time = 0.21, size = 7, normalized size = 0.70

$$\frac{1}{2}\arctan\left(e^{(2x)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(1+exp(4*x)),x, algorithm="giac")
```

```
[Out] 1/2*arctan(e^(2*x))
```

maple [A] time = 0.03, size = 8, normalized size = 0.80

$$\frac{\arctan\left(e^{2x}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(2*x)/(1+exp(4*x)),x)
```

```
[Out] 1/2*arctan(exp(x)^2)
```

maxima [A] time = 2.11, size = 7, normalized size = 0.70

$$\frac{1}{2}\arctan\left(e^{(2x)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(1+exp(4*x)),x, algorithm="maxima")
```

```
[Out] 1/2*arctan(e^(2*x))
```

mupad [B] time = 3.37, size = 7, normalized size = 0.70

$$\frac{\operatorname{atan}\left(e^{2\,x}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(2*x)/(exp(4*x) + 1),x)
```

```
[Out] atan(exp(2*x))/2
```

sympy [B] time = 0.11, size = 17, normalized size = 1.70

$$\operatorname{RootSum}\left(16z^2+1,\left(i\mapsto i\log\left(4i+e^{2x}\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(1+exp(4*x)),x)
```

```
[Out] RootSum(16*_z**2 + 1, Lambda(_i, _i*log(4*_i + exp(2*x))))
```

3.650 $\int \frac{1}{-3e^x+e^{2x}}\,dx$

Optimal. Leaf size=27

$$-\frac{x}{9}+\frac{e^{-x}}{3}+\frac{1}{9}\log\left(3-e^x\right)$$

```
[Out] 1/3/exp(x)-1/9*x+1/9*ln(3-exp(x))
```

Rubi [A] time = 0.02, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2282, 44}

$$-\frac{x}{9}+\frac{e^{-x}}{3}+\frac{1}{9}\log\left(3-e^x\right)$$

Antiderivative was successfully verified.

```
[In] Int[(-3*E^x + E^(2*x))^(-1),x]
```

```
[Out] 1/(3*E^x) - x/9 + Log[3 - E^x]/9
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}\int \frac{1}{-3e^x+e^{2x}}\,dx &= \text{Subst}\left(\int \frac{1}{(-3+x)x^2}\,dx,x,e^x\right)\\ &= \text{Subst}\left(\int \left(\frac{1}{9(-3+x)}-\frac{1}{3x^2}-\frac{1}{9x}\right)dx,x,e^x\right)\\ &= \frac{e^{-x}}{3}-\frac{x}{9}+\frac{1}{9}\log\left(3-e^x\right)\end{aligned}$$

Mathematica [A] time = 0.02, size = 23, normalized size = 0.85

$$\frac{1}{9}\left(-x+3e^{-x}+\log\left(3-e^x\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(-3*E^x + E^(2*x))^(-1),x]
[Out] (3/E^x - x + Log[3 - E^x])/9
```

fricas [A] time = 0.40, size = 21, normalized size = 0.78

$$-\frac{1}{9}\left(xe^x-e^x\log\left(e^x-3\right)-3\right)e^{(-x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-3*exp(x)+exp(2*x)),x, algorithm="fricas")
[Out] -1/9*(x*e^x - e^x*log(e^x - 3) - 3)*e^(-x)
```

giac [A] time = 0.21, size = 18, normalized size = 0.67

$$-\frac{1}{9}x+\frac{1}{3}e^{(-x)}+\frac{1}{9}\log\left(|e^x-3|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-3*exp(x)+exp(2*x)),x, algorithm="giac")
[Out] -1/9*x + 1/3*e^(-x) + 1/9*log(abs(e^x - 3))
```

maple [A] time = 0.04, size = 20, normalized size = 0.74

$$\frac{e^{-x}}{3}+\frac{\ln\left(e^x-3\right)}{9}-\frac{\ln\left(e^x\right)}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-3*exp(x)+exp(2*x)),x)
[Out] 1/9*ln(exp(x)-3)+1/3/exp(x)-1/9*ln(exp(x))
```

maxima [A] time = 0.74, size = 17, normalized size = 0.63

$$-\frac{1}{9}x+\frac{1}{3}e^{(-x)}+\frac{1}{9}\log\left(e^x-3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-3*exp(x)+exp(2*x)),x, algorithm="maxima")
[Out] -1/9*x + 1/3*e^(-x) + 1/9*log(e^x - 3)
```

mupad [B] time = 0.07, size = 17, normalized size = 0.63

$$\frac{e^{-x}}{3} - \frac{x}{9} + \frac{\ln\left(e^{x} - 3\right)}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(exp(2*x) - 3*exp(x)),x)
[Out] exp(-x)/3 - x/9 + log(exp(x) - 3)/9
```

sympy [A] time = 0.10, size = 17, normalized size = 0.63

$$-\frac{x}{9} + \frac{\log\left(e^{x} - 3\right)}{9} + \frac{e^{-x}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-3*exp(x)+exp(2*x)),x)
[Out] -x/9 + log(exp(x) - 3)/9 + exp(-x)/3
```

3.651 $\int \frac{e^x(-2+e^x)}{1+e^x}\,dx$

Optimal. Leaf size=12

$$e^x - 3\log(e^x + 1)$$

[Out] exp(x)-3*ln(1+exp(x))

Rubi [A] time = 0.04, antiderivative size = 12, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {2282, 43}

$$e^x - 3\log(e^x + 1)$$

Antiderivative was successfully verified.

[In] Int[(E^x*(-2 + E^x))/(1 + E^x),x]

[Out] E^x - 3*Log[1 + E^x]

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}\int \frac{e^x(-2+e^x)}{1+e^x}\,dx &= \text{Subst}\left(\int \frac{-2+x}{1+x}\,dx, x, e^x\right)\\ &= \text{Subst}\left(\int \left(1-\frac{3}{1+x}\right)dx, x, e^x\right)\\ &= e^x - 3\log(1+e^x)\end{aligned}$$

Mathematica [A] time = 0.01, size = 12, normalized size = 1.00

$$e^x - 3\log\left(e^x + 1\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^x*(-2 + E^x))/(1 + E^x),x]
[Out] E^x - 3*Log[1 + E^x]
```

fricas [A] time = 0.40, size = 10, normalized size = 0.83

$$e^x - 3\ \log\left(e^x + 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(-2+exp(x))/(1+exp(x)),x, algorithm="fricas")
[Out] e^x - 3*log(e^x + 1)
```

giac [A] time = 0.21, size = 10, normalized size = 0.83

$$e^x - 3\ \log\left(e^x + 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(-2+exp(x))/(1+exp(x)),x, algorithm="giac")
[Out] e^x - 3*log(e^x + 1)
```

maple [A] time = 0.02, size = 11, normalized size = 0.92

$$\mathrm{e}^x - 3\ln\left(\mathrm{e}^x + 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*(exp(x)-2)/(exp(x)+1),x)
[Out] exp(x)-3*ln(exp(x)+1)
```

maxima [A] time = 1.11, size = 10, normalized size = 0.83

$$e^x - 3\ \log\left(e^x + 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(-2+exp(x))/(1+exp(x)),x, algorithm="maxima")
[Out] e^x - 3*log(e^x + 1)
```

mupad [B] time = 3.33, size = 10, normalized size = 0.83

$$e^x - 3\ \ln(e^x + 1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(x)*(exp(x) - 2))/(exp(x) + 1),x)
[Out] exp(x) - 3*log(exp(x) + 1)
```

sympy [A] time = 0.09, size = 10, normalized size = 0.83

$$e^x - 3\log(e^x + 1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(-2+exp(x))/(1+exp(x)),x)
[Out] exp(x) - 3*log(exp(x) + 1)
```

3.652 $\int \frac{e^x}{-1+e^{2x}} \, dx$

Optimal. Leaf size=6

$$-\tanh^{-1}(e^x)$$

```
[Out] -arctanh(exp(x))
```

Rubi [A] time = 0.02, antiderivative size = 6, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2249, 207}

$$-\tanh^{-1}(e^x)$$

Antiderivative was successfully verified.

```
[In] Int[E^x/(-1 + E^(2*x)),x]
```

```
[Out] -ArcTanh[E^x]
```

Rule 207

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTanh[(Rt[b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (LtQ[a
, 0] || GtQ[b, 0])
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned} \int \frac{e^x}{-1+e^{2x}} \, dx &= \text{Subst}\left(\int \frac{1}{-1+x^2} \, dx, x, e^x\right) \\ &= -\tanh^{-1}(e^x) \end{aligned}$$

Mathematica [A] time = 0.00, size = 6, normalized size = 1.00

$$-\tanh^{-1}(e^x)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x/(-1 + E^(2*x)),x]
```

```
[Out] -ArcTanh[E^x]
```

fricas [B] time = 0.40, size = 15, normalized size = 2.50

$$-\frac{1}{2}\,\log\left(e^{x}+1\right)+\frac{1}{2}\,\log\left(e^{x}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(-1+exp(2*x)),x, algorithm="fricas")
```

```
[Out] -1/2*log(e^x + 1) + 1/2*log(e^x - 1)
```

giac [B] time = 0.21, size = 16, normalized size = 2.67

$$-\frac{1}{2}\,\log\left(e^{x}+1\right)+\frac{1}{2}\,\log\left(|e^{x}-1|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(-1+exp(2*x)),x, algorithm="giac")
```

```
[Out] -1/2*log(e^x + 1) + 1/2*log(abs(e^x - 1))
```

maple [A] time = 0.03, size = 6, normalized size = 1.00

$$-\operatorname{arctanh}\left(\mathrm{e}^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(exp(2*x)-1),x)
```

```
[Out] -arctanh(exp(x))
```

maxima [B] time = 0.77, size = 15, normalized size = 2.50

$$-\frac{1}{2}\,\log\left(e^{x}+1\right)+\frac{1}{2}\,\log\left(e^{x}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(-1+exp(2*x)),x, algorithm="maxima")
```

```
[Out] -1/2*log(e^x + 1) + 1/2*log(e^x - 1)
```

mupad [B] time = 0.08, size = 15, normalized size = 2.50

$$\frac{\ln\left(\mathrm{e}^x-1\right)}{2}-\frac{\ln\left(\mathrm{e}^x+1\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(exp(2*x) - 1),x)
[Out] log(exp(x) - 1)/2 - log(exp(x) + 1)/2
```

sympy [B] time = 0.10, size = 15, normalized size = 2.50

$$\frac{\log\left(e^x-1\right)}{2}-\frac{\log\left(e^x+1\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(-1+exp(2*x)),x)
[Out] log(exp(x) - 1)/2 - log(exp(x) + 1)/2
```

3.653 $\int \frac{e^x}{1+e^{2x}} dx$

Optimal. Leaf size=4

$$\tan^{-1}(e^x)$$

```
[Out] arctan(exp(x))
```

Rubi [A] time = 0.02, antiderivative size = 4, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2249, 203}

$$\tan^{-1}(e^x)$$

Antiderivative was successfully verified.

```
[In] Int[E^x/(1 + E^(2*x)),x]
```

```
[Out] ArcTan[E^x]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned} \int \frac{e^x}{1+e^{2x}} dx &= \text{Subst}\left(\int \frac{1}{1+x^2} dx, x, e^x\right) \\ &= \tan^{-1}(e^x) \end{aligned}$$

Mathematica [A] time = 0.00, size = 4, normalized size = 1.00

$$\tan^{-1}(e^x)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x/(1 + E^(2*x)),x]
```

```
[Out] ArcTan[E^x]
```

fricas [A] time = 0.40, size = 3, normalized size = 0.75

$$\arctan\left(e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1+exp(2*x)),x, algorithm="fricas")
```

```
[Out] arctan(e^x)
```

giac [A] time = 0.20, size = 3, normalized size = 0.75

$$\arctan\left(e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1+exp(2*x)),x, algorithm="giac")
```

```
[Out] arctan(e^x)
```

maple [A] time = 0.03, size = 4, normalized size = 1.00

$$\arctan\left(\mathrm{e}^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(1+exp(2*x)),x)
```

```
[Out] arctan(exp(x))
```

maxima [A] time = 1.69, size = 3, normalized size = 0.75

$$\arctan\left(e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1+exp(2*x)),x, algorithm="maxima")
```

```
[Out] arctan(e^x)
```

mupad [B] time = 0.05, size = 3, normalized size = 0.75

$$\mathrm{atan}\left(\mathrm{e}^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(exp(2*x) + 1),x)
```

```
[Out] atan(exp(x))
```

sympy [B] time = 0.11, size = 15, normalized size = 3.75

$$\operatorname{RootSum}\left(4z^2+1,\left(i\mapsto i\log\left(2i+e^x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1+exp(2*x)),x)
```

```
[Out] RootSum(4*_z**2 + 1, Lambda(_i, _i*log(2*_i + exp(x))))
```

3.654 $\int \frac{e^{-x}+e^x}{-e^{-x}+e^x} \, dx$

Optimal. Leaf size=12

$$\log \left(e^{-x}-e^x\right)$$

[Out] ln(exp(-x)-exp(x))

Rubi [A] time = 0.04, antiderivative size = 14, normalized size of antiderivative = 1.17, number of steps used = 4, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used = {2282, 446, 72}

$$\log \left(1-e^{2x}\right)-x$$

Antiderivative was successfully verified.

[In] Int[(E^(-x) + E^x)/(-E^(-x) + E^x),x]

[Out] -x + Log[1 - E^(2*x)]

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 446

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}\int \frac{e^{-x}+e^x}{-e^{-x}+e^x}\,dx &= \text{Subst}\left(\int \frac{-1-x^2}{x\left(1-x^2\right)}\,dx,x,e^x\right)\\ &= \frac{1}{2}\,\text{Subst}\left(\int \frac{-1-x}{(1-x)x}\,dx,x,e^{2x}\right)\\ &= \frac{1}{2}\,\text{Subst}\left(\int \left(\frac{2}{-1+x}-\frac{1}{x}\right)dx,x,e^{2x}\right)\\ &= -x+\log\left(1-e^{2x}\right)\end{aligned}$$

Mathematica [A] time = 0.01, size = 14, normalized size = 1.17

$$\log\left(1-e^{2x}\right)-x$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^(-x) + E^x)/(-E^(-x) + E^x),x]
[Out] -x + Log[1 - E^(2*x)]
```

fricas [A] time = 0.40, size = 11, normalized size = 0.92

$$-x+\log\left(e^{(2x)}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(-x)+exp(x))/(-1/exp(x)+exp(x)),x, algorithm="fricas")
[Out] -x + log(e^(2*x) - 1)
```

giac [A] time = 0.21, size = 12, normalized size = 1.00

$$-x+\log\left(\left|e^{(2x)}-1\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(-x)+exp(x))/(-1/exp(x)+exp(x)),x, algorithm="giac")
[Out] -x + log(abs(e^(2*x) - 1))
```

maple [A] time = 0.04, size = 17, normalized size = 1.42

$$\ln\left(e^x-1\right)+\ln\left(e^x+1\right)-\ln\left(e^x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(-x)+exp(x))/(-1/exp(x)+exp(x)),x)
```

```
[Out] ln(-1+exp(x))+ln(exp(x)+1)-ln(exp(x))
```

maxima [A] time = 0.95, size = 10, normalized size = 0.83

$$\log\left(e^{(-x)} - e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(-x)+exp(x))/(-1/exp(x)+exp(x)),x, algorithm="maxima")
```

```
[Out] log(e^(-x) - e^x)
```

mupad [B] time = 0.06, size = 11, normalized size = 0.92

$$\ln\left(\mathrm{e}^{2\,x} - 1\right) - x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-(exp(-x) + exp(x))/(exp(-x) - exp(x)),x)
```

```
[Out] log(exp(2*x) - 1) - x
```

sympy [A] time = 0.09, size = 8, normalized size = 0.67

$$-x + \log\left(e^{2x} - 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(-x)+exp(x))/(-1/exp(x)+exp(x)),x)
```

```
[Out] -x + log(exp(2*x) - 1)
```

3.655 $\int \frac{-e^{-x}+e^x}{e^{-x}+e^x} \, dx$

Optimal. Leaf size=10

$$\log\left(e^{-x}+e^x\right)$$

```
[Out] ln(exp(-x)+exp(x))
```

Rubi [A] time = 0.04, antiderivative size = 12, normalized size of antiderivative = 1.20, number of steps used = 4, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used = {2282, 446, 72}

$$\log\left(e^{2x}+1\right)-x$$

Antiderivative was successfully verified.

```
[In] Int[(-E^(-x) + E^x)/(E^(-x) + E^x),x]
```

```
[Out] -x + Log[1 + E^(2*x)]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 446

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\int \frac{-e^{-x}+e^x}{e^{-x}+e^x}\,dx = \text{Subst}\left(\int \frac{-1+x^2}{x\left(1+x^2\right)}\,dx, x, e^x\right)$$
$$= \frac{1}{2}\,\text{Subst}\left(\int \frac{-1+x}{x(1+x)}\,dx, x, e^{2x}\right)$$
$$= \frac{1}{2}\,\text{Subst}\left(\int \left(-\frac{1}{x}+\frac{2}{1+x}\right)dx, x, e^{2x}\right)$$
$$= -x+\log\left(1+e^{2x}\right)$$

Mathematica [A] time = 0.01, size = 12, normalized size = 1.20

$$\log\left(e^{2x}+1\right)-x$$

Antiderivative was successfully verified.

```
[In] Integrate[(-E^(-x) + E^x)/(E^(-x) + E^x),x]
```

```
[Out] -x + Log[1 + E^(2*x)]
```

fricas [A] time = 0.41, size = 11, normalized size = 1.10

$$-x+\log\left(e^{(2x)}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-1/exp(x)+exp(x))/(exp(-x)+exp(x)),x, algorithm="fricas")
```

```
[Out] -x + log(e^(2*x) + 1)
```

giac [A] time = 0.21, size = 11, normalized size = 1.10

$$-x+\log\left(e^{(2x)}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-1/exp(x)+exp(x))/(exp(-x)+exp(x)),x, algorithm="giac")
```

```
[Out] -x + log(e^(2*x) + 1)
```

maple [A] time = 0.04, size = 14, normalized size = 1.40

$$\ln\left(e^{2x}+1\right)-\ln\left(e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-1/exp(x)+exp(x))/(exp(-x)+exp(x)),x)
```

```
[Out] ln(1+exp(x)^2)-ln(exp(x))
```

maxima [A] time = 0.88, size = 8, normalized size = 0.80

$$\log\left(e^{(-x)} + e^x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-1/exp(x)+exp(x))/(exp(-x)+exp(x)),x, algorithm="maxima")
```

```
[Out] log(e^(-x) + e^x)
```

mupad [B] time = 3.54, size = 11, normalized size = 1.10

$$\ln\left(e^{2x} + 1\right) - x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-(exp(-x) - exp(x))/(exp(-x) + exp(x)),x)
```

```
[Out] log(exp(2*x) + 1) - x
```

sympy [A] time = 0.10, size = 8, normalized size = 0.80

$$-x + \log\left(e^{2x} + 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-1/exp(x)+exp(x))/(exp(-x)+exp(x)),x)
```

```
[Out] -x + log(exp(2*x) + 1)
```

3.656 $\int \frac{e^{-2x}+e^{2x}}{-e^{-2x}+e^{2x}}\,dx$

Optimal. Leaf size=18

$$\frac{1}{2}\log\left(1-e^{4x}\right)-x$$

```
[Out] -x+1/2*ln(1-exp(4*x))
```

Rubi [A] time = 0.04, antiderivative size = 18, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2282, 446, 72}

$$\frac{1}{2}\log\left(1-e^{4x}\right)-x$$

Antiderivative was successfully verified.

```
[In] Int[(E^(-2*x) + E^(2*x))/(-E^(-2*x) + E^(2*x)),x]
```

```
[Out] -x + Log[1 - E^(4*x)]/2
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 446

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\int \frac{e^{-2x}+e^{2x}}{-e^{-2x}+e^{2x}}\,dx = \frac{1}{2}\,\text{Subst}\left(\int \frac{-1-x^2}{x\left(1-x^2\right)}\,dx, x, e^{2x}\right)$$
$$= \frac{1}{4}\,\text{Subst}\left(\int \frac{-1-x}{(1-x)x}\,dx, x, e^{4x}\right)$$
$$= \frac{1}{4}\,\text{Subst}\left(\int \left(\frac{2}{-1+x}-\frac{1}{x}\right)\,dx, x, e^{4x}\right)$$
$$= -x+\frac{1}{2}\log\left(1-e^{4x}\right)$$

Mathematica [**A**] time = 0.01, size = 18, normalized size = 1.00

$$\frac{1}{2}\log\left(1-e^{4x}\right)-x$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^(-2*x) + E^(2*x))/(-E^(-2*x) + E^(2*x)),x]
```

```
[Out] -x + Log[1 - E^(4*x)]/2
```

fricas [**A**] time = 0.42, size = 13, normalized size = 0.72

$$-x+\frac{1}{2}\log\left(e^{(4x)}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(-2*x)+exp(2*x))/(-1/exp(2*x)+exp(2*x)),x, algorithm="fricas"
)
```

```
[Out] -x + 1/2*log(e^(4*x) - 1)
```

giac [**A**] time = 0.22, size = 14, normalized size = 0.78

$$-x+\frac{1}{2}\log\left(\left|e^{(4x)}-1\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(-2*x)+exp(2*x))/(-1/exp(2*x)+exp(2*x)),x, algorithm="giac")
```

```
[Out] -x + 1/2*log(abs(e^(4*x) - 1))
```

maple [A] time = 0.04, size = 30, normalized size = 1.67

$$\frac{\ln\left(e^{x}-1\right)}{2}+\frac{\ln\left(e^{x}+1\right)}{2}+\frac{\ln\left(e^{2x}+1\right)}{2}-\ln\left(e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(-2*x)+exp(2*x))/(-1/exp(2*x)+exp(2*x)),x)
```

```
[Out] 1/2*ln(exp(x)-1)+1/2*ln(1+exp(x)^2)+1/2*ln(exp(x)+1)-ln(exp(x))
```

maxima [A] time = 1.02, size = 14, normalized size = 0.78

$$\frac{1}{2}\log\left(e^{(2x)}-e^{(-2x)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(-2*x)+exp(2*x))/(-1/exp(2*x)+exp(2*x)),x, algorithm="maxima"
)
```

```
[Out] 1/2*log(e^(2*x) - e^(-2*x))
```

mupad [B] time = 3.34, size = 22, normalized size = 1.22

$$\frac{\ln\left(e^{2x}-1\right)}{2}-x+\frac{\ln\left(e^{2x}+1\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-(exp(-2*x) + exp(2*x))/(exp(-2*x) - exp(2*x)),x)
```

```
[Out] log(exp(2*x) - 1)/2 - x + log(exp(2*x) + 1)/2
```

sympy [A] time = 0.10, size = 10, normalized size = 0.56

$$-x+\frac{\log\left(e^{4x}-1\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(-2*x)+exp(2*x))/(-1/exp(2*x)+exp(2*x)),x)
```

```
[Out] -x + log(exp(4*x) - 1)/2
```

3.657 $\int \frac{e^x}{\sqrt{1+e^{2x}}} \, dx$

Optimal. Leaf size=4

$$\sinh^{-1}(e^x)$$

```
[Out] arcsinh(exp(x))
```

Rubi [A] time = 0.02, antiderivative size = 4, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {2249, 215}

$$\sinh^{-1}(e^x)$$

Antiderivative was successfully verified.

```
[In] Int[E^x/Sqrt[1 + E^(2*x)],x]
```

```
[Out] ArcSinh[E^x]
```

Rule 215

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSinh[(Rt[b, 2]*x)/Sqr
t[a]]/Rt[b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && PosQ[b]
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{e^x}{\sqrt{1+e^{2x}}} \, dx &= \text{Subst}\left(\int \frac{1}{\sqrt{1+x^2}} \, dx, x, e^x\right) \\
&= \sinh^{-1}(e^x)
\end{aligned}$$

Mathematica [A] time = 0.00, size = 4, normalized size = 1.00

$$\sinh^{-1}(e^x)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x/Sqrt[1 + E^(2*x)],x]
```

```
[Out] ArcSinh[E^x]
```

fricas [B] time = 0.40, size = 16, normalized size = 4.00

$$-\log\left(\sqrt{e^{(2x)}+1}-e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1+exp(2*x))^(1/2),x, algorithm="fricas")
```

```
[Out] -log(sqrt(e^(2*x) + 1) - e^x)
```

giac [B] time = 0.19, size = 16, normalized size = 4.00

$$-\log\left(\sqrt{e^{(2x)}+1}-e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1+exp(2*x))^(1/2),x, algorithm="giac")
```

```
[Out] -log(sqrt(e^(2*x) + 1) - e^x)
```

maple [A] time = 0.04, size = 4, normalized size = 1.00

$$\operatorname{arcsinh}\left(\mathrm{e}^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(exp(2*x)+1)^(1/2),x)
```

```
[Out] arcsinh(exp(x))
```

maxima [A] time = 1.65, size = 3, normalized size = 0.75

$$\operatorname{arsinh}\left(e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1+exp(2*x))^(1/2),x, algorithm="maxima")
```

```
[Out] arcsinh(e^x)
```

mupad [B] time = 0.08, size = 3, normalized size = 0.75

$$\operatorname{asinh}\left(\mathrm{e}^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(exp(2*x) + 1)^(1/2),x)
```

```
[Out] asinh(exp(x))
```

sympy [A] time = 0.64, size = 3, normalized size = 0.75

$$\operatorname{asinh}\left(e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1+exp(2*x))**(1/2),x)
```

```
[Out] asinh(exp(x))
```

3.658 $\int \frac{e^{\sqrt{4+x}}}{\sqrt{4+x}} \, dx$

Optimal. Leaf size=11

$$2e^{\sqrt{x+4}}$$

[Out] 2*exp((4+x)^(1/2))

Rubi [A] time = 0.02, antiderivative size = 11, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.059, Rules used = {2209}

$$2e^{\sqrt{x+4}}$$

Antiderivative was successfully verified.

[In] Int[E^Sqrt[4 + x]/Sqrt[4 + x],x]

[Out] 2*E^Sqrt[4 + x]

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{e^{\sqrt{4+x}}}{\sqrt{4+x}} \, dx = 2e^{\sqrt{4+x}}$$

Mathematica [A] time = 0.00, size = 11, normalized size = 1.00

$$2e^{\sqrt{x+4}}$$

Antiderivative was successfully verified.

[In] Integrate[E^Sqrt[4 + x]/Sqrt[4 + x],x]

[Out] 2*E^Sqrt[4 + x]

fricas [A] time = 0.40, size = 8, normalized size = 0.73

$$2 e^{\left(\sqrt{x+4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((4+x)^(1/2))/(4+x)^(1/2),x, algorithm="fricas")
[Out] 2*e^(sqrt(x + 4))
```

giac [A]   time = 0.20, size = 8, normalized size = 0.73

$$2\,e^{\left(\sqrt{x+4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((4+x)^(1/2))/(4+x)^(1/2),x, algorithm="giac")
[Out] 2*e^(sqrt(x + 4))
```

maple [A]   time = 0.02, size = 9, normalized size = 0.82

$$2\,\mathrm{e}^{\sqrt{x+4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp((x+4)^(1/2))/(x+4)^(1/2),x)
[Out] 2*exp((x+4)^(1/2))
```

maxima [A]   time = 0.88, size = 8, normalized size = 0.73

$$2\,e^{\left(\sqrt{x+4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((4+x)^(1/2))/(4+x)^(1/2),x, algorithm="maxima")
[Out] 2*e^(sqrt(x + 4))
```

mupad [B]   time = 3.46, size = 8, normalized size = 0.73

$$2\,\mathrm{e}^{\sqrt{x+4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp((x + 4)^(1/2))/(x + 4)^(1/2),x)
[Out] 2*exp((x + 4)^(1/2))
```

sympy [A]   time = 0.21, size = 8, normalized size = 0.73

$$2e^{\sqrt{x+4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((4+x)**(1/2))/(4+x)**(1/2),x)
```

```
[Out] 2*exp(sqrt(x + 4))
```

3.659 $\int \frac{x}{\sqrt{-1+e^{2x^2}}}\,dx$

Optimal. Leaf size=18

$$\frac{1}{2}\tan^{-1}\left(\sqrt{e^{2x^2}-1}\right)$$

```
[Out] 1/2*arctan((-1+exp(2*x^2))^(1/2))
```

Rubi [A] time = 0.06, antiderivative size = 18, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267, Rules used = {6715, 2282, 63, 203}

$$\frac{1}{2}\tan^{-1}\left(\sqrt{e^{2x^2}-1}\right)$$

Antiderivative was successfully verified.

```
[In] Int[x/Sqrt[-1 + E^(2*x^2)],x]
```

```
[Out] ArcTan[Sqrt[-1 + E^(2*x^2)]]/2
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6715

```
Int[(u_)*(x_)^(m_.), x_Symbol] :> Dist[1/(m + 1), Subst[Int[SubstFor[x^(m +
 1), u, x], x], x, x^(m + 1)], x] /; FreeQ[m, x] && NeQ[m, -1] && FunctionO
fQ[x^(m + 1), u, x]
```

Rubi steps

$$\begin{aligned}\int \frac{x}{\sqrt{-1+e^{2x^2}}}\,dx &= \frac{1}{2}\,\text{Subst}\left(\int \frac{1}{\sqrt{-1+e^{2x}}}\,dx, x, x^2\right)\\ &= \frac{1}{4}\,\text{Subst}\left(\int \frac{1}{\sqrt{-1+x}\,x}\,dx, x, e^{2x^2}\right)\\ &= \frac{1}{2}\,\text{Subst}\left(\int \frac{1}{1+x^2}\,dx, x, \sqrt{-1+e^{2x^2}}\right)\\ &= \frac{1}{2}\tan^{-1}\left(\sqrt{-1+e^{2x^2}}\right)\end{aligned}$$

Mathematica [A] time = 0.02, size = 18, normalized size = 1.00

$$\frac{1}{2}\tan^{-1}\left(\sqrt{e^{2x^2}-1}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x/Sqrt[-1 + E^(2*x^2)],x]
```

```
[Out] ArcTan[Sqrt[-1 + E^(2*x^2)]]/2
```

fricas [A] time = 0.40, size = 13, normalized size = 0.72

$$\frac{1}{2}\arctan\left(\sqrt{e^{\left(2x^2\right)}-1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-1+exp(2*x^2))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/2*arctan(sqrt(e^(2*x^2) - 1))
```

giac [A] time = 0.23, size = 13, normalized size = 0.72

$$\frac{1}{2}\arctan\left(\sqrt{e^{\left(2x^2\right)}-1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-1+exp(2*x^2))^(1/2),x, algorithm="giac")
[Out] 1/2*arctan(sqrt(e^(2*x^2) - 1))
```

maple [A] time = 0.03, size = 14, normalized size = 0.78

$$\frac{\arctan\left(\sqrt{e^{2x^2}-1}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(-1+exp(2*x^2))^(1/2),x)
[Out] 1/2*arctan((-1+exp(2*x^2))^(1/2))
```

maxima [A] time = 2.24, size = 13, normalized size = 0.72

$$\frac{1}{2}\arctan\left(\sqrt{e^{\left(2\,x^2\right)}-1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-1+exp(2*x^2))^(1/2),x, algorithm="maxima")
[Out] 1/2*arctan(sqrt(e^(2*x^2) - 1))
```

mupad [B] time = 3.71, size = 13, normalized size = 0.72

$$\frac{\mathrm{atan}\left(\sqrt{e^{2\,x^2}-1}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(exp(2*x^2) - 1)^(1/2),x)
[Out] atan((exp(2*x^2) - 1)^(1/2))/2
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{\sqrt{\left(e^{x^2}-1\right)\left(e^{x^2}+1\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(-1+exp(2*x**2))**(1/2),x)
[Out] Integral(x/sqrt((exp(x**2) - 1)*(exp(x**2) + 1)), x)
```

3.660 $\int e^x\sqrt{9+e^{2x}}\,dx$

Optimal. Leaf size=31

$$\frac{1}{2}e^x\sqrt{e^{2x}+9}+\frac{9}{2}\sinh^{-1}\left(\frac{e^x}{3}\right)$$

```
[Out] 9/2*arcsinh(1/3*exp(x))+1/2*exp(x)*(9+exp(2*x))^(1/2)
```

Rubi [A] time = 0.03, antiderivative size = 31, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2249, 195, 215}

$$\frac{1}{2}e^x\sqrt{e^{2x}+9}+\frac{9}{2}\sinh^{-1}\left(\frac{e^x}{3}\right)$$

Antiderivative was successfully verified.

```
[In] Int[E^x*Sqrt[9 + E^(2*x)],x]
```

```
[Out] (E^x*Sqrt[9 + E^(2*x)])/2 + (9*ArcSinh[E^x/3])/2
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 215

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSinh[(Rt[b, 2]*x)/Sqr
t[a]]/Rt[b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && PosQ[b]
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\int e^x\sqrt{9+e^{2x}}\,dx = \text{Subst}\left(\int\sqrt{9+x^2}\,dx, x, e^x\right)$$
$$= \frac{1}{2}e^x\sqrt{9+e^{2x}} + \frac{9}{2}\text{Subst}\left(\int\frac{1}{\sqrt{9+x^2}}\,dx, x, e^x\right)$$
$$= \frac{1}{2}e^x\sqrt{9+e^{2x}} + \frac{9}{2}\sinh^{-1}\left(\frac{e^x}{3}\right)$$

Mathematica [A] time = 0.01, size = 30, normalized size = 0.97

$$\frac{1}{2}\left(e^x\sqrt{e^{2x}+9} + 9\sinh^{-1}\left(\frac{e^x}{3}\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x*Sqrt[9 + E^(2*x)],x]
[Out] (E^x*Sqrt[9 + E^(2*x)] + 9*ArcSinh[E^x/3])/2
```

fricas [A] time = 0.41, size = 29, normalized size = 0.94

$$\frac{1}{2}\sqrt{e^{(2x)}+9}\,e^x - \frac{9}{2}\log\left(\sqrt{e^{(2x)}+9} - e^x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(9+exp(2*x))^(1/2),x, algorithm="fricas")
[Out] 1/2*sqrt(e^(2*x) + 9)*e^x - 9/2*log(sqrt(e^(2*x) + 9) - e^x)
```

giac [A] time = 0.22, size = 29, normalized size = 0.94

$$\frac{1}{2}\sqrt{e^{(2x)}+9}\,e^x - \frac{9}{2}\log\left(\sqrt{e^{(2x)}+9} - e^x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(9+exp(2*x))^(1/2),x, algorithm="giac")
[Out] 1/2*sqrt(e^(2*x) + 9)*e^x - 9/2*log(sqrt(e^(2*x) + 9) - e^x)
```

maple [A] time = 0.04, size = 21, normalized size = 0.68

$$\frac{9\,\mathrm{arcsinh}\left(\frac{e^x}{3}\right)}{2} + \frac{\sqrt{e^{2x}+9}\;e^x}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*(9+exp(2*x))^(1/2),x)
```

```
[Out] 1/2*exp(x)*(9+exp(x)^2)^(1/2)+9/2*arcsinh(1/3*exp(x))
```

maxima [A] time = 2.01, size = 20, normalized size = 0.65

$$\frac{1}{2}\sqrt{e^{(2x)}+9}\,e^{x}+\frac{9}{2}\,\operatorname{arsinh}\left(\frac{1}{3}\,e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(9+exp(2*x))^(1/2),x, algorithm="maxima")
```

```
[Out] 1/2*sqrt(e^(2*x) + 9)*e^x + 9/2*arcsinh(1/3*e^x)
```

mupad [B] time = 3.59, size = 20, normalized size = 0.65

$$\frac{9\operatorname{asinh}\left(\frac{e^{x}}{3}\right)}{2}+\frac{e^{x}\sqrt{e^{2x}+9}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*(exp(2*x) + 9)^(1/2),x)
```

```
[Out] (9*asinh(exp(x)/3))/2 + (exp(x)*(exp(2*x) + 9)^(1/2))/2
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\sqrt{e^{2x}+9}\,e^{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(9+exp(2*x))**(1/2),x)
```

```
[Out] Integral(sqrt(exp(2*x) + 9)*exp(x), x)
```

3.661 $\int e^x \sqrt{1+e^{2x}}\, dx$

Optimal. Leaf size=27

$$\frac{1}{2}e^x\sqrt{e^{2x}+1}+\frac{1}{2}\sinh^{-1}\left(e^x\right)$$

```
[Out] 1/2*arcsinh(exp(x))+1/2*exp(x)*(1+exp(2*x))^(1/2)
```

Rubi [A] time = 0.02, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2249, 195, 215}

$$\frac{1}{2}e^x\sqrt{e^{2x}+1}+\frac{1}{2}\sinh^{-1}\left(e^x\right)$$

Antiderivative was successfully verified.

```
[In] Int[E^x*Sqrt[1 + E^(2*x)],x]
```

```
[Out] (E^x*Sqrt[1 + E^(2*x)])/2 + ArcSinh[E^x]/2
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 215

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSinh[(Rt[b, 2]*x)/Sqr
t[a]]/Rt[b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && PosQ[b]
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}\int e^x\sqrt{1+e^{2x}}\,dx &= \text{Subst}\left(\int\sqrt{1+x^2}\,dx, x, e^x\right)\\ &= \frac{1}{2}e^x\sqrt{1+e^{2x}} + \frac{1}{2}\text{Subst}\left(\int\frac{1}{\sqrt{1+x^2}}\,dx, x, e^x\right)\\ &= \frac{1}{2}e^x\sqrt{1+e^{2x}} + \frac{1}{2}\sinh^{-1}(e^x)\end{aligned}$$

Mathematica [A] time = 0.01, size = 24, normalized size = 0.89

$$\frac{1}{2}\left(e^x\sqrt{e^{2x}+1} + \sinh^{-1}(e^x)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x*Sqrt[1 + E^(2*x)],x]
[Out] (E^x*Sqrt[1 + E^(2*x)] + ArcSinh[E^x])/2
```

fricas [A] time = 0.41, size = 29, normalized size = 1.07

$$\frac{1}{2}\sqrt{e^{(2x)}+1}\,e^x - \frac{1}{2}\log\left(\sqrt{e^{(2x)}+1} - e^x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(1+exp(2*x))^(1/2),x, algorithm="fricas")
[Out] 1/2*sqrt(e^(2*x) + 1)*e^x - 1/2*log(sqrt(e^(2*x) + 1) - e^x)
```

giac [A] time = 0.23, size = 29, normalized size = 1.07

$$\frac{1}{2}\sqrt{e^{(2x)}+1}\,e^x - \frac{1}{2}\log\left(\sqrt{e^{(2x)}+1} - e^x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(1+exp(2*x))^(1/2),x, algorithm="giac")
[Out] 1/2*sqrt(e^(2*x) + 1)*e^x - 1/2*log(sqrt(e^(2*x) + 1) - e^x)
```

maple [A] time = 0.03, size = 19, normalized size = 0.70

$$\frac{\operatorname{arcsinh}(e^x)}{2} + \frac{\sqrt{e^{2x}+1}\,e^x}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*(exp(2*x)+1)^(1/2),x)
```

```
[Out] 1/2*exp(x)*(1+exp(x)^2)^(1/2)+1/2*arcsinh(exp(x))
```

maxima [A] time = 1.69, size = 18, normalized size = 0.67

$$\frac{1}{2}\sqrt{e^{(2x)}+1}\,e^{x}+\frac{1}{2}\,\operatorname{arsinh}\left(e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(1+exp(2*x))^(1/2),x, algorithm="maxima")
```

```
[Out] 1/2*sqrt(e^(2*x) + 1)*e^x + 1/2*arcsinh(e^x)
```

mupad [B] time = 3.55, size = 18, normalized size = 0.67

$$\frac{\operatorname{asinh}\left(e^{x}\right)}{2}+\frac{e^{x}\sqrt{e^{2x}+1}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*(exp(2*x) + 1)^(1/2),x)
```

```
[Out] asinh(exp(x))/2 + (exp(x)*(exp(2*x) + 1)^(1/2))/2
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\sqrt{e^{2x}+1}\,e^{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(1+exp(2*x))**(1/2),x)
```

```
[Out] Integral(sqrt(exp(2*x) + 1)*exp(x), x)
```

3.662 $\int \frac{e^{x^2}x}{1+e^{2x^2}}\,dx$

Optimal. Leaf size=10

$$\frac{1}{2}\tan^{-1}\left(e^{x^2}\right)$$

```
[Out] 1/2*arctan(exp(x^2))
```

Rubi [A] time = 0.13, antiderivative size = 10, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {6715, 2249, 203}

$$\frac{1}{2}\tan^{-1}\left(e^{x^2}\right)$$

Antiderivative was successfully verified.

```
[In] Int[(E^x^2*x)/(1 + E^(2*x^2)),x]
```

```
[Out] ArcTan[E^x^2]/2
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rule 6715

```
Int[(u_)*(x_)^(m_.), x_Symbol] :> Dist[1/(m + 1), Subst[Int[SubstFor[x^(m +
 1), u, x], x], x, x^(m + 1)], x] /; FreeQ[m, x] && NeQ[m, -1] && FunctionO
fQ[x^(m + 1), u, x]
```

Rubi steps

$$\int \frac{e^{x^2}x}{1+e^{2x^2}}\,dx = \frac{1}{2}\,\text{Subst}\left(\int \frac{e^x}{1+e^{2x}}\,dx, x, x^2\right)$$
$$= \frac{1}{2}\,\text{Subst}\left(\int \frac{1}{1+x^2}\,dx, x, e^{x^2}\right)$$
$$= \frac{1}{2}\tan^{-1}\left(e^{x^2}\right)$$

Mathematica [A] time = 0.02, size = 10, normalized size = 1.00

$$\frac{1}{2}\tan^{-1}\left(e^{x^2}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^x^2*x)/(1 + E^(2*x^2)),x]
[Out] ArcTan[E^x^2]/2
```

fricas [A] time = 0.40, size = 7, normalized size = 0.70

$$\frac{1}{2}\arctan\left(e^{\left(x^2\right)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^2)*x/(1+exp(2*x^2)),x, algorithm="fricas")
[Out] 1/2*arctan(e^(x^2))
```

giac [A] time = 0.22, size = 7, normalized size = 0.70

$$\frac{1}{2}\arctan\left(e^{\left(x^2\right)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^2)*x/(1+exp(2*x^2)),x, algorithm="giac")
[Out] 1/2*arctan(e^(x^2))
```

maple [A] time = 0.03, size = 8, normalized size = 0.80

$$\frac{\arctan\left(\mathrm{e}^{x^2}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x^2)*x/(1+exp(2*x^2)),x)
```

```
[Out] 1/2*arctan(exp(x^2))
```

maxima [A] time = 1.92, size = 7, normalized size = 0.70

$$\frac{1}{2}\arctan\left(e^{\left(x^{2}\right)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^2)*x/(1+exp(2*x^2)),x, algorithm="maxima")
```

```
[Out] 1/2*arctan(e^(x^2))
```

mupad [B] time = 0.07, size = 7, normalized size = 0.70

$$\frac{\operatorname{atan}\left(e^{x^2}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*exp(x^2))/(exp(2*x^2) + 1),x)
```

```
[Out] atan(exp(x^2))/2
```

sympy [B] time = 0.14, size = 17, normalized size = 1.70

$$\operatorname{RootSum}\left(16z^{2}+1,\left(i\mapsto i\log\left(4i+e^{x^{2}}\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x**2)*x/(1+exp(2*x**2)),x)
```

```
[Out] RootSum(16*_z**2 + 1, Lambda(_i, _i*log(4*_i + exp(x**2))))
```

3.663 $\int e^{x^{3/2}} x^2 \, dx$

Optimal. Leaf size=28

$$\frac{2}{3}e^{x^{3/2}}x^{3/2} - \frac{2e^{x^{3/2}}}{3}$$

```
[Out] -2/3*exp(x^(3/2))+2/3*exp(x^(3/2))*x^(3/2)
```

Rubi [A] time = 0.04, antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {2216, 2212, 2209}

$$\frac{2}{3}e^{x^{3/2}}x^{3/2} - \frac{2e^{x^{3/2}}}{3}$$

Antiderivative was successfully verified.

```
[In] Int[E^x^(3/2)*x^2,x]
```

```
[Out] (-2*E^x^(3/2))/3 + (2*E^x^(3/2)*x^(3/2))/3
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rule 2216

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> With[{k = Denominator[n]}, Dist[k/d, Subst[Int[x^(k*(m + 1
) - 1)*F^(a + b*x^(k*n)), x], x, (c + d*x)^(1/k)], x]] /; FreeQ[{F, a, b, c
, d, m, n}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[0, (m + 1)/n, 5] &&  !Inte
gerQ[n]
```

Rubi steps

$$\begin{aligned}\int e^{x^{3/2}}x^2\,dx &= 2\,\mathrm{Subst}\left(\int e^{x^3}x^5\,dx, x, \sqrt{x}\right)\\ &= \frac{2}{3}e^{x^{3/2}}x^{3/2} - 2\,\mathrm{Subst}\left(\int e^{x^3}x^2\,dx, x, \sqrt{x}\right)\\ &= -\frac{2}{3}e^{x^{3/2}} + \frac{2}{3}e^{x^{3/2}}x^{3/2}\end{aligned}$$

Mathematica [C] time = 0.00, size = 13, normalized size = 0.46

$$-\frac{2}{3}\Gamma\left(2, -x^{3/2}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x^(3/2)*x^2,x]
[Out] (-2*Gamma[2, -x^(3/2)])/3
```

fricas [A] time = 0.40, size = 11, normalized size = 0.39

$$\frac{2}{3}\left(x^{\frac{3}{2}} - 1\right)e^{\left(x^{\frac{3}{2}}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^(3/2))*x^2,x, algorithm="fricas")
[Out] 2/3*(x^(3/2) - 1)*e^(x^(3/2))
```

giac [A] time = 0.25, size = 11, normalized size = 0.39

$$\frac{2}{3}\left(x^{\frac{3}{2}} - 1\right)e^{\left(x^{\frac{3}{2}}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^(3/2))*x^2,x, algorithm="giac")
[Out] 2/3*(x^(3/2) - 1)*e^(x^(3/2))
```

maple [A] time = 0.03, size = 17, normalized size = 0.61

$$\frac{2x^{\frac{3}{2}}\mathrm{e}^{x^{\frac{3}{2}}}}{3} - \frac{2\,\mathrm{e}^{x^{\frac{3}{2}}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x^(3/2))*x^2,x)
```

```
[Out] -2/3*exp(x^(3/2))+2/3*exp(x^(3/2))*x^(3/2)
```

maxima [A] time = 0.68, size = 11, normalized size = 0.39

$$\frac{2}{3}\left(x^{\frac{3}{2}}-1\right)e^{\left(x^{\frac{3}{2}}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^(3/2))*x^2,x, algorithm="maxima")
```

```
[Out] 2/3*(x^(3/2) - 1)*e^(x^(3/2))
```

mupad [B] time = 3.57, size = 16, normalized size = 0.57

$$\frac{2\,x^{3/2}\,\mathrm{e}^{x^{3/2}}}{3}-\frac{2\,\mathrm{e}^{x^{3/2}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*exp(x^(3/2)),x)
```

```
[Out] (2*x^(3/2)*exp(x^(3/2)))/3 - (2*exp(x^(3/2)))/3
```

sympy [A] time = 3.11, size = 24, normalized size = 0.86

$$\frac{2x^{\frac{3}{2}}e^{x^{\frac{3}{2}}}}{3}-\frac{2e^{x^{\frac{3}{2}}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x**(3/2))*x**2,x)
```

```
[Out] 2*x**(3/2)*exp(x**(3/2))/3 - 2*exp(x**(3/2))/3
```

3.664 $\int \frac{e^x}{\sqrt{-3+e^{2x}}} \, dx$

Optimal. Leaf size=16

$$\tanh^{-1}\left(\frac{e^x}{\sqrt{e^{2x}-3}}\right)$$

```
[Out] arctanh(exp(x)/(-3+exp(2*x))^(1/2))
```

Rubi [A] time = 0.02, antiderivative size = 16, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2249, 217, 206}

$$\tanh^{-1}\left(\frac{e^x}{\sqrt{e^{2x}-3}}\right)$$

Antiderivative was successfully verified.

```
[In] Int[E^x/Sqrt[-3 + E^(2*x)],x]
```

```
[Out] ArcTanh[E^x/Sqrt[-3 + E^(2*x)]]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\int \frac{e^x}{\sqrt{-3+e^{2x}}}\,dx = \text{Subst}\left(\int \frac{1}{\sqrt{-3+x^2}}\,dx, x, e^x\right)$$
$$= \text{Subst}\left(\int \frac{1}{1-x^2}\,dx, x, \frac{e^x}{\sqrt{-3+e^{2x}}}\right)$$
$$= \tanh^{-1}\left(\frac{e^x}{\sqrt{-3+e^{2x}}}\right)$$

Mathematica [**A**] time = 0.00, size = 16, normalized size = 1.00

$$\tanh^{-1}\left(\frac{e^x}{\sqrt{e^{2x}-3}}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x/Sqrt[-3 + E^(2*x)],x]
[Out] ArcTanh[E^x/Sqrt[-3 + E^(2*x)]]
```

fricas [**A**] time = 0.39, size = 16, normalized size = 1.00

$$-\log\left(\sqrt{e^{(2x)}-3}-e^x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(-3+exp(2*x))^(1/2),x, algorithm="fricas")
[Out] -log(sqrt(e^(2*x) - 3) - e^x)
```

giac [**A**] time = 0.18, size = 16, normalized size = 1.00

$$-\log\left(-\sqrt{e^{(2x)}-3}+e^x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(-3+exp(2*x))^(1/2),x, algorithm="giac")
[Out] -log(-sqrt(e^(2*x) - 3) + e^x)
```

maple [**A**] time = 0.04, size = 13, normalized size = 0.81

$$\ln\left(e^x+\sqrt{e^{2x}-3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(-3+exp(2*x))^(1/2),x)
```

```
[Out] ln(exp(x)+(-3+exp(x)^2)^(1/2))
```

maxima [A] time = 1.26, size = 16, normalized size = 1.00

$$\log\left(2\sqrt{e^{(2x)}-3}+2e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(-3+exp(2*x))^(1/2),x, algorithm="maxima")
```

```
[Out] log(2*sqrt(e^(2*x) - 3) + 2*e^x)
```

mupad [B] time = 3.77, size = 12, normalized size = 0.75

$$\ln\left(\mathrm{e}^{x}+\sqrt{\mathrm{e}^{2x}-3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(exp(2*x) - 3)^(1/2),x)
```

```
[Out] log(exp(x) + (exp(2*x) - 3)^(1/2))
```

sympy [A] time = 0.67, size = 10, normalized size = 0.62

$$\operatorname{acosh}\left(\frac{\sqrt{3}e^{x}}{3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(-3+exp(2*x))**(1/2),x)
```

```
[Out] acosh(sqrt(3)*exp(x)/3)
```

3.665 $\int \frac{e^x}{16-e^{2x}} \, dx$

Optimal. Leaf size=12

$$\frac{1}{4}\tanh^{-1}\left(\frac{e^x}{4}\right)$$

```
[Out] 1/4*arctanh(1/4*exp(x))
```

Rubi [A] time = 0.02, antiderivative size = 12, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {2249, 206}

$$\frac{1}{4}\tanh^{-1}\left(\frac{e^x}{4}\right)$$

Antiderivative was successfully verified.

```
[In] Int[E^x/(16 - E^(2*x)),x]
```

```
[Out] ArcTanh[E^x/4]/4
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{e^x}{16-e^{2x}} \, dx &= \text{Subst}\left(\int \frac{1}{16-x^2} \, dx, x, e^x\right)\\ &= \frac{1}{4}\tanh^{-1}\left(\frac{e^x}{4}\right)\end{aligned}$$

Mathematica [A] time = 0.00, size = 12, normalized size = 1.00

$$\frac{1}{4}\tanh^{-1}\left(\frac{e^x}{4}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x/(16 - E^(2*x)),x]
```

```
[Out] ArcTanh[E^x/4]/4
```

fricas [B] time = 0.40, size = 15, normalized size = 1.25

$$\frac{1}{8}\,\log\left(e^x+4\right)-\frac{1}{8}\,\log\left(e^x-4\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(16-exp(2*x)),x, algorithm="fricas")
```

```
[Out] 1/8*log(e^x + 4) - 1/8*log(e^x - 4)
```

giac [B] time = 0.19, size = 16, normalized size = 1.33

$$\frac{1}{8}\,\log\left(e^x+4\right)-\frac{1}{8}\,\log\left(|e^x-4|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(16-exp(2*x)),x, algorithm="giac")
```

```
[Out] 1/8*log(e^x + 4) - 1/8*log(abs(e^x - 4))
```

maple [B] time = 0.04, size = 16, normalized size = 1.33

$$-\frac{\ln\left(\mathrm{e}^x-4\right)}{8}+\frac{\ln\left(\mathrm{e}^x+4\right)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(16-exp(2*x)),x)
```

```
[Out] 1/8*ln(exp(x)+4)-1/8*ln(exp(x)-4)
```

maxima [B] time = 1.05, size = 15, normalized size = 1.25

$$\frac{1}{8}\,\log\left(e^x+4\right)-\frac{1}{8}\,\log\left(e^x-4\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(16-exp(2*x)),x, algorithm="maxima")
```

```
[Out] 1/8*log(e^x + 4) - 1/8*log(e^x - 4)
```

mupad [B] time = 3.65, size = 15, normalized size = 1.25

$$\frac{\ln\left(e^x+4\right)}{8}-\frac{\ln\left(e^x-4\right)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-exp(x)/(exp(2*x) - 16),x)
```

```
[Out] log(exp(x) + 4)/8 - log(exp(x) - 4)/8
```

sympy [B] time = 0.11, size = 15, normalized size = 1.25

$$-\frac{\log\left(e^{x}-4\right)}{8}+\frac{\log\left(e^{x}+4\right)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(16-exp(2*x)),x)
```

```
[Out] -log(exp(x) - 4)/8 + log(exp(x) + 4)/8
```

3.666 $\int \frac{e^{5x}}{1+e^{10x}}\,dx$

Optimal. Leaf size=10

$$\frac{1}{5}\tan^{-1}\left(e^{5x}\right)$$

```
[Out] 1/5*arctan(exp(5*x))
```

Rubi [A] time = 0.02, antiderivative size = 10, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {2249, 203}

$$\frac{1}{5}\tan^{-1}\left(e^{5x}\right)$$

Antiderivative was successfully verified.

```
[In] Int[E^(5*x)/(1 + E^(10*x)),x]
```

```
[Out] ArcTan[E^(5*x)]/5
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned} \int \frac{e^{5x}}{1+e^{10x}}\,dx &= \frac{1}{5}\text{Subst}\left(\int \frac{1}{1+x^2}\,dx, x, e^{5x}\right)\\ &= \frac{1}{5}\tan^{-1}\left(e^{5x}\right) \end{aligned}$$

Mathematica [A] time = 0.00, size = 10, normalized size = 1.00

$$\frac{1}{5}\tan^{-1}\left(e^{5x}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(5*x)/(1 + E^(10*x)),x]
```

```
[Out] ArcTan[E^(5*x)]/5
```

fricas [A] time = 0.39, size = 7, normalized size = 0.70

$$\frac{1}{5}\arctan\left(e^{(5\,x)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(5*x)/(1+exp(10*x)),x, algorithm="fricas")
```

```
[Out] 1/5*arctan(e^(5*x))
```

giac [A] time = 0.22, size = 7, normalized size = 0.70

$$\frac{1}{5}\arctan\left(e^{(5\,x)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(5*x)/(1+exp(10*x)),x, algorithm="giac")
```

```
[Out] 1/5*arctan(e^(5*x))
```

maple [A] time = 0.03, size = 8, normalized size = 0.80

$$\frac{\arctan\left(\mathrm{e}^{5x}\right)}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(5*x)/(1+exp(10*x)),x)
```

```
[Out] 1/5*arctan(exp(x)^5)
```

maxima [A] time = 2.28, size = 7, normalized size = 0.70

$$\frac{1}{5}\arctan\left(e^{(5\,x)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(5*x)/(1+exp(10*x)),x, algorithm="maxima")
```

```
[Out] 1/5*arctan(e^(5*x))
```

mupad [B] time = 0.06, size = 7, normalized size = 0.70

$$\frac{\operatorname{atan}\left(\mathrm{e}^{5\,x}\right)}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(5*x)/(exp(10*x) + 1),x)
```

```
[Out] atan(exp(5*x))/5
```

sympy [B] time = 0.11, size = 17, normalized size = 1.70

$$\operatorname{RootSum}\left(100z^2+1,\left(i\mapsto i\log\left(10i+e^{5x}\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(5*x)/(1+exp(10*x)),x)
```

```
[Out] RootSum(100*_z**2 + 1, Lambda(_i, _i*log(10*_i + exp(5*x))))
```

3.667 $\int \frac{e^{4x}}{\sqrt{16+e^{8x}}}\,dx$

Optimal. Leaf size=14

$$\frac{1}{4}\sinh^{-1}\left(\frac{e^{4x}}{4}\right)$$

```
[Out] 1/4*arcsinh(1/4*exp(4*x))
```

Rubi [A] time = 0.02, antiderivative size = 14, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118, Rules used = {2249, 215}

$$\frac{1}{4}\sinh^{-1}\left(\frac{e^{4x}}{4}\right)$$

Antiderivative was successfully verified.

```
[In] Int[E^(4*x)/Sqrt[16 + E^(8*x)],x]
```

```
[Out] ArcSinh[E^(4*x)/4]/4
```

Rule 215

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSinh[(Rt[b, 2]*x)/Sqr
t[a]]/Rt[b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && PosQ[b]
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{e^{4x}}{\sqrt{16+e^{8x}}}\,dx &= \frac{1}{4}\text{Subst}\left(\int \frac{1}{\sqrt{16+x^2}}\,dx, x, e^{4x}\right)\\ &= \frac{1}{4}\sinh^{-1}\left(\frac{e^{4x}}{4}\right)\end{aligned}$$

Mathematica [A] time = 0.01, size = 14, normalized size = 1.00

$$\frac{1}{4}\sinh^{-1}\left(\frac{e^{4x}}{4}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(4*x)/Sqrt[16 + E^(8*x)],x]
[Out] ArcSinh[E^(4*x)/4]/4
```

fricas [A] time = 0.39, size = 18, normalized size = 1.29

$$-\frac{1}{4}\log\left(\sqrt{e^{(8x)}+16}-e^{(4x)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x)/(16+exp(8*x))^(1/2),x, algorithm="fricas")
[Out] -1/4*log(sqrt(e^(8*x) + 16) - e^(4*x))
```

giac [A] time = 0.21, size = 18, normalized size = 1.29

$$-\frac{1}{4}\log\left(\sqrt{e^{(8x)}+16}-e^{(4x)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x)/(16+exp(8*x))^(1/2),x, algorithm="giac")
[Out] -1/4*log(sqrt(e^(8*x) + 16) - e^(4*x))
```

maple [F] time = 0.10, size = 0, normalized size = 0.00

$$\int \frac{e^{4x}}{\sqrt{e^{8x}+16}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(4*x)/(16+exp(8*x))^(1/2),x)
[Out] int(exp(4*x)/(16+exp(8*x))^(1/2),x)
```

maxima [A] time = 1.25, size = 9, normalized size = 0.64

$$\frac{1}{4}\,\mathrm{arsinh}\left(\frac{1}{4}\,e^{(4x)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x)/(16+exp(8*x))^(1/2),x, algorithm="maxima")
```

```
[Out] 1/4*arcsinh(1/4*e^(4*x))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.07

$$\int \frac{e^{4x}}{\sqrt{e^{8x}+16}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(4*x)/(exp(8*x) + 16)^(1/2),x)
```

```
[Out] int(exp(4*x)/(exp(8*x) + 16)^(1/2), x)
```

sympy [A] time = 0.89, size = 8, normalized size = 0.57

$$\frac{\operatorname{asinh}\left(\frac{e^{4x}}{4}\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x)/(16+exp(8*x))**(1/2),x)
```

```
[Out] asinh(exp(4*x)/4)/4
```

3.668 $\int e^{4x^3} x^2 \cos \left(7x^3\right) \, dx$

Optimal. Leaf size=35

$$\frac{7}{195} e^{4x^3} \sin \left(7x^3\right) + \frac{4}{195} e^{4x^3} \cos \left(7x^3\right)$$

```
[Out] 4/195*exp(4*x^3)*cos(7*x^3)+7/195*exp(4*x^3)*sin(7*x^3)
```

Rubi [A] time = 0.18, antiderivative size = 35, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118, Rules used = {6715, 4433}

$$\frac{7}{195} e^{4x^3} \sin \left(7x^3\right) + \frac{4}{195} e^{4x^3} \cos \left(7x^3\right)$$

Antiderivative was successfully verified.

```
[In] Int[E^(4*x^3)*x^2*Cos[7*x^3],x]
```

```
[Out] (4*E^(4*x^3)*Cos[7*x^3])/195 + (7*E^(4*x^3)*Sin[7*x^3])/195
```

Rule 4433

```
Int[Cos[(d_.) + (e_.)*(x_)]*(F_)^((c_.)*((a_.) + (b_.)*(x_))), x_Symbol] :>
 Simp[(b*c*Log[F]*F^(c*(a + b*x))*Cos[d + e*x])/(e^2 + b^2*c^2*Log[F]^2), x
] + Simp[(e*F^(c*(a + b*x))*Sin[d + e*x])/(e^2 + b^2*c^2*Log[F]^2), x] /; F
reeQ[{F, a, b, c, d, e}, x] && NeQ[e^2 + b^2*c^2*Log[F]^2, 0]
```

Rule 6715

```
Int[(u_)*(x_)^(m_.), x_Symbol] :> Dist[1/(m + 1), Subst[Int[SubstFor[x^(m +
 1), u, x], x], x, x^(m + 1)], x] /; FreeQ[m, x] && NeQ[m, -1] && FunctionO
fQ[x^(m + 1), u, x]
```

Rubi steps

$$\begin{aligned} \int e^{4x^3} x^2 \cos \left(7x^3\right) \, dx &= \frac{1}{3} \text{Subst}\left(\int e^{4x} \cos(7x) \, dx, x, x^3\right) \\ &= \frac{4}{195} e^{4x^3} \cos \left(7x^3\right) + \frac{7}{195} e^{4x^3} \sin \left(7x^3\right) \end{aligned}$$

Mathematica [A] time = 0.06, size = 28, normalized size = 0.80

$$\frac{1}{195} e^{4x^3} \left(7 \sin \left(7x^3\right) + 4 \cos \left(7x^3\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(4*x^3)*x^2*Cos[7*x^3],x]
```

```
[Out] (E^(4*x^3)*(4*Cos[7*x^3] + 7*Sin[7*x^3]))/195
```

fricas [A] time = 0.42, size = 29, normalized size = 0.83

$$\frac{4}{195} \cos\left(7 x^3\right) e^{\left(4 x^3\right)} + \frac{7}{195} e^{\left(4 x^3\right)} \sin\left(7 x^3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x^3)*x^2*cos(7*x^3),x, algorithm="fricas")
```

```
[Out] 4/195*cos(7*x^3)*e^(4*x^3) + 7/195*e^(4*x^3)*sin(7*x^3)
```

giac [A] time = 0.22, size = 25, normalized size = 0.71

$$\frac{1}{195} \left(4 \cos\left(7 x^3\right) + 7 \sin\left(7 x^3\right)\right) e^{\left(4 x^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x^3)*x^2*cos(7*x^3),x, algorithm="giac")
```

```
[Out] 1/195*(4*cos(7*x^3) + 7*sin(7*x^3))*e^(4*x^3)
```

maple [A] time = 0.16, size = 53, normalized size = 1.51

$$\frac{-\frac{4 \, \mathrm{e}^{4 x^3} \left(\tan^2\left(\frac{7 x^3}{2}\right)\right)}{195} + \frac{14 \, \mathrm{e}^{4 x^3} \tan\left(\frac{7 x^3}{2}\right)}{195} + \frac{4 \, \mathrm{e}^{4 x^3}}{195}}{\tan^2\left(\frac{7 x^3}{2}\right) + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(4*x^3)*x^2*cos(7*x^3),x)
```

```
[Out] (14/195*exp(4*x^3)*tan(7/2*x^3)-4/195*exp(4*x^3)*tan(7/2*x^3)^2+4/195*exp(4
*x^3))/(1+tan(7/2*x^3)^2)
```

maxima [A] time = 0.86, size = 29, normalized size = 0.83

$$\frac{4}{195} \cos\left(7 x^3\right) e^{\left(4 x^3\right)} + \frac{7}{195} e^{\left(4 x^3\right)} \sin\left(7 x^3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x^3)*x^2*cos(7*x^3),x, algorithm="maxima")
[Out] 4/195*cos(7*x^3)*e^(4*x^3) + 7/195*e^(4*x^3)*sin(7*x^3)
```

mupad [B] time = 3.59, size = 25, normalized size = 0.71

$$\frac{e^{4x^3}\left(4\cos\left(7x^3\right)+7\sin\left(7x^3\right)\right)}{195}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*exp(4*x^3)*cos(7*x^3),x)
[Out] (exp(4*x^3)*(4*cos(7*x^3) + 7*sin(7*x^3)))/195
```

sympy [A] time = 1.82, size = 32, normalized size = 0.91

$$\frac{7e^{4x^3}\sin\left(7x^3\right)}{195}+\frac{4e^{4x^3}\cos\left(7x^3\right)}{195}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(4*x**3)*x**2*cos(7*x**3),x)
[Out] 7*exp(4*x**3)*sin(7*x**3)/195 + 4*exp(4*x**3)*cos(7*x**3)/195
```

3.669 $\int e^{1+x^2} x \, dx$

Optimal. Leaf size=11

$$\frac{e^{x^2+1}}{2}$$

[Out] 1/2*exp(x^2+1)

Rubi [A] time = 0.01, antiderivative size = 11, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2209}

$$\frac{e^{x^2+1}}{2}$$

Antiderivative was successfully verified.

[In] Int[E^(1 + x^2)*x,x]

[Out] E^(1 + x^2)/2

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rubi steps

$$\int e^{1+x^2} x \, dx = \frac{e^{1+x^2}}{2}$$

Mathematica [A] time = 0.00, size = 11, normalized size = 1.00

$$\frac{e^{x^2+1}}{2}$$

Antiderivative was successfully verified.

[In] Integrate[E^(1 + x^2)*x,x]

[Out] E^(1 + x^2)/2

fricas [A] time = 0.39, size = 8, normalized size = 0.73

$$\frac{1}{2}\, e^{\left(x^2+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^2+1)*x,x, algorithm="fricas")
[Out] 1/2*e^(x^2 + 1)
```

giac [A] time = 0.19, size = 8, normalized size = 0.73

$$\frac{1}{2}\, e^{\left(x^2+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^2+1)*x,x, algorithm="giac")
[Out] 1/2*e^(x^2 + 1)
```

maple [A] time = 0.02, size = 9, normalized size = 0.82

$$\frac{e^{x^2+1}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x^2+1)*x,x)
[Out] 1/2*exp(x^2+1)
```

maxima [A] time = 0.91, size = 8, normalized size = 0.73

$$\frac{1}{2}\, e^{\left(x^2+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^2+1)*x,x, algorithm="maxima")
[Out] 1/2*e^(x^2 + 1)
```

mupad [B] time = 0.05, size = 8, normalized size = 0.73

$$\frac{e^{x^2}\, e}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*exp(x^2 + 1),x)
```

```
[Out] (exp(x^2)*exp(1))/2
```

sympy [A] time = 0.08, size = 7, normalized size = 0.64

$$\frac{e^{x^2+1}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x**2+1)*x,x)
```

```
[Out] exp(x**2 + 1)/2
```

3.670 $\int e^{1+x^3} x^2 \, dx$

Optimal. Leaf size=11

$$\frac{e^{x^3+1}}{3}$$

```
[Out] 1/3*exp(x^3+1)
```

Rubi [A] time = 0.02, antiderivative size = 11, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {2209}

$$\frac{e^{x^3+1}}{3}$$

Antiderivative was successfully verified.

```
[In] Int[E^(1 + x^3)*x^2,x]
```

```
[Out] E^(1 + x^3)/3
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rubi steps

$$\int e^{1+x^3} x^2 \, dx = \frac{e^{1+x^3}}{3}$$

Mathematica [A] time = 0.00, size = 11, normalized size = 1.00

$$\frac{e^{x^3+1}}{3}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(1 + x^3)*x^2,x]
```

```
[Out] E^(1 + x^3)/3
```

fricas [A] time = 0.39, size = 8, normalized size = 0.73

$$\frac{1}{3}\,e^{\left(x^3+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^3+1)*x^2,x, algorithm="fricas")
```

```
[Out] 1/3*e^(x^3 + 1)
```

giac [A] time = 0.18, size = 8, normalized size = 0.73

$$\frac{1}{3}\,e^{\left(x^3+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^3+1)*x^2,x, algorithm="giac")
```

```
[Out] 1/3*e^(x^3 + 1)
```

maple [A] time = 0.02, size = 9, normalized size = 0.82

$$\frac{e^{x^3+1}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x^3+1)*x^2,x)
```

```
[Out] 1/3*exp(x^3+1)
```

maxima [A] time = 0.72, size = 8, normalized size = 0.73

$$\frac{1}{3}\,e^{\left(x^3+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^3+1)*x^2,x, algorithm="maxima")
```

```
[Out] 1/3*e^(x^3 + 1)
```

mupad [B] time = 3.51, size = 8, normalized size = 0.73

$$\frac{e^{x^3}\,e}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*exp(x^3 + 1),x)
```

```
[Out] (exp(x^3)*exp(1))/3
```

sympy [A] time = 0.09, size = 7, normalized size = 0.64

$$\frac{e^{x^3+1}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x**3+1)*x**2,x)
```

```
[Out] exp(x**3 + 1)/3
```

3.671 $\int \frac{e^{\sqrt{x}}}{\sqrt{x}} dx$

Optimal. Leaf size=9

$$2e^{\sqrt{x}}$$

```
[Out] 2*exp(x^(1/2))
```

Rubi [A] time = 0.01, antiderivative size = 9, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2209}

$$2e^{\sqrt{x}}$$

Antiderivative was successfully verified.

```
[In] Int[E^Sqrt[x]/Sqrt[x],x]
```

```
[Out] 2*E^Sqrt[x]
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{e^{\sqrt{x}}}{\sqrt{x}} dx = 2e^{\sqrt{x}}$$

Mathematica [A] time = 0.00, size = 9, normalized size = 1.00

$$2e^{\sqrt{x}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^Sqrt[x]/Sqrt[x],x]
```

```
[Out] 2*E^Sqrt[x]
```

fricas [A] time = 0.39, size = 6, normalized size = 0.67

$$2 e^{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^(1/2))/x^(1/2),x, algorithm="fricas")
[Out] 2*e^sqrt(x)
```

giac [A] time = 0.19, size = 6, normalized size = 0.67

$$2 e^{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^(1/2))/x^(1/2),x, algorithm="giac")
[Out] 2*e^sqrt(x)
```

maple [A] time = 0.02, size = 7, normalized size = 0.78

$$2\,\mathrm{e}^{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x^(1/2))/x^(1/2),x)
[Out] 2*exp(x^(1/2))
```

maxima [A] time = 0.88, size = 6, normalized size = 0.67

$$2 e^{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^(1/2))/x^(1/2),x, algorithm="maxima")
[Out] 2*e^sqrt(x)
```

mupad [B] time = 3.49, size = 6, normalized size = 0.67

$$2\,\mathrm{e}^{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x^(1/2))/x^(1/2),x)
[Out] 2*exp(x^(1/2))
```

sympy [A] time = 0.20, size = 7, normalized size = 0.78

$$2e^{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x**(1/2))/x**(1/2),x)
```

```
[Out] 2*exp(sqrt(x))
```

3.672 $\int \frac{e^{\sqrt[3]{x}}}{x^{2/3}}\,dx$

Optimal. Leaf size=9

$$3e^{\sqrt[3]{x}}$$

[Out] 3*exp(x^(1/3))

Rubi [A] time = 0.01, antiderivative size = 9, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2209}

$$3e^{\sqrt[3]{x}}$$

Antiderivative was successfully verified.

[In] Int[E^x^(1/3)/x^(2/3),x]

[Out] 3*E^x^(1/3)

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{e^{\sqrt[3]{x}}}{x^{2/3}}\,dx = 3e^{\sqrt[3]{x}}$$

Mathematica [A] time = 0.00, size = 9, normalized size = 1.00

$$3e^{\sqrt[3]{x}}$$

Antiderivative was successfully verified.

[In] Integrate[E^x^(1/3)/x^(2/3),x]

[Out] 3*E^x^(1/3)

fricas [A] time = 0.40, size = 6, normalized size = 0.67

$$3\,e^{\left(x^{\frac{1}{3}}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^(1/3))/x^(2/3),x, algorithm="fricas")
[Out] 3*e^(x^(1/3))
```

giac [A] time = 0.21, size = 6, normalized size = 0.67

$$3\,e^{\left(x^{\frac{1}{3}}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^(1/3))/x^(2/3),x, algorithm="giac")
[Out] 3*e^(x^(1/3))
```

maple [A] time = 0.02, size = 7, normalized size = 0.78

$$3\,\mathrm{e}^{x^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x^(1/3))/x^(2/3),x)
[Out] 3*exp(x^(1/3))
```

maxima [A] time = 0.95, size = 6, normalized size = 0.67

$$3\,e^{\left(x^{\frac{1}{3}}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^(1/3))/x^(2/3),x, algorithm="maxima")
[Out] 3*e^(x^(1/3))
```

mupad [B] time = 3.57, size = 6, normalized size = 0.67

$$3\,\mathrm{e}^{x^{1/3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x^(1/3))/x^(2/3),x)
[Out] 3*exp(x^(1/3))
```

sympy [A] time = 0.37, size = 7, normalized size = 0.78

$$3e^{\sqrt[3]{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x**(1/3))/x**(2/3),x)
[Out] 3*exp(x**(1/3))
```

3.673 $\int e^{3x}\left(-8+2x^3+x^5\right)\,dx$

Optimal. Leaf size=68

$$\frac{1}{3}e^{3x}x^5-\frac{5}{9}e^{3x}x^4+\frac{38}{27}e^{3x}x^3-\frac{38}{27}e^{3x}x^2+\frac{76}{81}e^{3x}x-\frac{724e^{3x}}{243}$$

```
[Out] -724/243*exp(3*x)+76/81*exp(3*x)*x-38/27*exp(3*x)*x^2+38/27*exp(3*x)*x^3-5/
9*exp(3*x)*x^4+1/3*exp(3*x)*x^5
```

Rubi [A] time = 0.11, antiderivative size = 68, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 3, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.188, Rules used = {2196, 2194, 2176}

$$\frac{1}{3}e^{3x}x^5-\frac{5}{9}e^{3x}x^4+\frac{38}{27}e^{3x}x^3-\frac{38}{27}e^{3x}x^2+\frac{76}{81}e^{3x}x-\frac{724e^{3x}}{243}$$

Antiderivative was successfully verified.

```
[In] Int[E^(3*x)*(-8 + 2*x^3 + x^5),x]
```

```
[Out] (-724*E^(3*x))/243 + (76*E^(3*x)*x)/81 - (38*E^(3*x)*x^2)/27 + (38*E^(3*x)*
x^3)/27 - (5*E^(3*x)*x^4)/9 + (E^(3*x)*x^5)/3
```

Rule 2176

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_.), x_Symbol] :> Simp[((c + d*x)^m*(b*F^(g*(e + f*x)))^n)/(f*g*n*Log[F]),
x] - Dist[(d*m)/(f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*(b*F^(g*(e + f*x)))^n
, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && GtQ[m, 0] && IntegerQ[2*m
] &&  !$UseGamma === True
```

Rule 2194

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 2196

```
Int[(F_)^((c_.)*(v_))*(u_), x_Symbol] :> Int[ExpandIntegrand[F^(c*ExpandToS
um[v, x]), u, x], x] /; FreeQ[{F, c}, x] && PolynomialQ[u, x] && LinearQ[v,
 x] &&  !$UseGamma === True
```

Rubi steps

$$
\begin{aligned}
\int e^{3x}\left(-8+2x^3+x^5\right)\,dx &= \int\left(-8e^{3x}+2e^{3x}x^3+e^{3x}x^5\right)\,dx\\
&= 2\int e^{3x}x^3\,dx-8\int e^{3x}\,dx+\int e^{3x}x^5\,dx\\
&= -\frac{8e^{3x}}{3}+\frac{2}{3}e^{3x}x^3+\frac{1}{3}e^{3x}x^5-\frac{5}{3}\int e^{3x}x^4\,dx-2\int e^{3x}x^2\,dx\\
&= -\frac{8e^{3x}}{3}-\frac{2}{3}e^{3x}x^2+\frac{2}{3}e^{3x}x^3-\frac{5}{9}e^{3x}x^4+\frac{1}{3}e^{3x}x^5+\frac{4}{3}\int e^{3x}x\,dx+\frac{20}{9}\int e^{3x}x^3\,dx\\
&= -\frac{8e^{3x}}{3}+\frac{4}{9}e^{3x}x-\frac{2}{3}e^{3x}x^2+\frac{38}{27}e^{3x}x^3-\frac{5}{9}e^{3x}x^4+\frac{1}{3}e^{3x}x^5-\frac{4}{9}\int e^{3x}\,dx-\frac{20}{9}\int e^{3x}x^2\\
&= -\frac{76e^{3x}}{27}+\frac{4}{9}e^{3x}x-\frac{38}{27}e^{3x}x^2+\frac{38}{27}e^{3x}x^3-\frac{5}{9}e^{3x}x^4+\frac{1}{3}e^{3x}x^5+\frac{40}{27}\int e^{3x}x\,dx\\
&= -\frac{76e^{3x}}{27}+\frac{76}{81}e^{3x}x-\frac{38}{27}e^{3x}x^2+\frac{38}{27}e^{3x}x^3-\frac{5}{9}e^{3x}x^4+\frac{1}{3}e^{3x}x^5-\frac{40}{81}\int e^{3x}\,dx\\
&= -\frac{724e^{3x}}{243}+\frac{76}{81}e^{3x}x-\frac{38}{27}e^{3x}x^2+\frac{38}{27}e^{3x}x^3-\frac{5}{9}e^{3x}x^4+\frac{1}{3}e^{3x}x^5
\end{aligned}
$$

Mathematica [A] time = 0.02, size = 34, normalized size = 0.50

$$\frac{1}{243}e^{3x}\left(81x^5-135x^4+342x^3-342x^2+228x-724\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(3*x)*(-8 + 2*x^3 + x^5),x]
[Out] (E^(3*x)*(-724 + 228*x - 342*x^2 + 342*x^3 - 135*x^4 + 81*x^5))/243
```

fricas [A] time = 0.38, size = 31, normalized size = 0.46

$$\frac{1}{243}\left(81\,x^5-135\,x^4+342\,x^3-342\,x^2+228\,x-724\right)e^{(3\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(3*x)*(x^5+2*x^3-8),x, algorithm="fricas")
[Out] 1/243*(81*x^5 - 135*x^4 + 342*x^3 - 342*x^2 + 228*x - 724)*e^(3*x)
```

giac [A] time = 0.21, size = 31, normalized size = 0.46

$$\frac{1}{243}\left(81\,x^5-135\,x^4+342\,x^3-342\,x^2+228\,x-724\right)e^{(3\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(3*x)*(x^5+2*x^3-8),x, algorithm="giac")
```

```
[Out] 1/243*(81*x^5 - 135*x^4 + 342*x^3 - 342*x^2 + 228*x - 724)*e^(3*x)
```

maple [A] time = 0.03, size = 32, normalized size = 0.47

$$\frac{\left(81x^{5}-135x^{4}+342x^{3}-342x^{2}+228x-724\right)\mathrm{e}^{3x}}{243}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(3*x)*(x^5+2*x^3-8),x)
```

```
[Out] 1/243*exp(3*x)*(81*x^5-135*x^4+342*x^3-342*x^2+228*x-724)
```

maxima [A] time = 0.86, size = 59, normalized size = 0.87

$$\frac{1}{243}\left(81\,x^{5}-135\,x^{4}+180\,x^{3}-180\,x^{2}+120\,x-40\right)e^{(3\,x)}+\frac{2}{27}\left(9\,x^{3}-9\,x^{2}+6\,x-2\right)e^{(3\,x)}-\frac{8}{3}\,e^{(3\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(3*x)*(x^5+2*x^3-8),x, algorithm="maxima")
```

```
[Out] 1/243*(81*x^5 - 135*x^4 + 180*x^3 - 180*x^2 + 120*x - 40)*e^(3*x) + 2/27*(9
*x^3 - 9*x^2 + 6*x - 2)*e^(3*x) - 8/3*e^(3*x)
```

mupad [B] time = 3.53, size = 31, normalized size = 0.46

$$\frac{\mathrm{e}^{3\,x}\,\left(81\,x^{5}-135\,x^{4}+342\,x^{3}-342\,x^{2}+228\,x-724\right)}{243}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(3*x)*(2*x^3 + x^5 - 8),x)
```

```
[Out] (exp(3*x)*(228*x - 342*x^2 + 342*x^3 - 135*x^4 + 81*x^5 - 724))/243
```

sympy [A] time = 0.10, size = 31, normalized size = 0.46

$$\frac{\left(81x^{5}-135x^{4}+342x^{3}-342x^{2}+228x-724\right)e^{3x}}{243}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(3*x)*(x**5+2*x**3-8),x)
```

```
[Out] (81*x**5 - 135*x**4 + 342*x**3 - 342*x**2 + 228*x - 724)*exp(3*x)/243
```

3.674 $\int (e^x + x)^2 \, dx$

Optimal. Leaf size=28

$$\frac{x^3}{3} + 2e^x x - 2e^x + \frac{e^{2x}}{2}$$

```
[Out] -2*exp(x)+1/2*exp(2*x)+2*exp(x)*x+1/3*x^3
```

Rubi [A] time = 0.02, antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, integrand size = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429, Rules used = {6742, 2194, 2176}

$$\frac{x^3}{3} + 2e^x x - 2e^x + \frac{e^{2x}}{2}$$

Antiderivative was successfully verified.

```
[In] Int[(E^x + x)^2,x]
```

```
[Out] -2*E^x + E^(2*x)/2 + 2*E^x*x + x^3/3
```

Rule 2176

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_.), x_Symbol] :> Simp[((c + d*x)^m*(b*F^(g*(e + f*x)))^n)/(f*g*n*Log[F]),
x] - Dist[(d*m)/(f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*(b*F^(g*(e + f*x)))^n
, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && GtQ[m, 0] && IntegerQ[2*m
] &&  !$UseGamma === True
```

Rule 2194

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\begin{aligned}\int (e^x+x)^2\,dx &= \int \left(e^{2x}+2e^x x+x^2\right)dx\\ &= \frac{x^3}{3}+2\int e^x x\,dx+\int e^{2x}\,dx\\ &= \frac{e^{2x}}{2}+2e^x x+\frac{x^3}{3}-2\int e^x\,dx\\ &= -2e^x+\frac{e^{2x}}{2}+2e^x x+\frac{x^3}{3}\end{aligned}$$

Mathematica [A] time = 0.02, size = 26, normalized size = 0.93

$$\frac{x^3}{3}+\frac{e^{2x}}{2}+e^x(2x-2)$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^x + x)^2,x]
[Out] E^(2*x)/2 + x^3/3 + E^x*(-2 + 2*x)
```

fricas [A] time = 0.38, size = 19, normalized size = 0.68

$$\frac{1}{3}\,x^3+2\,(x-1)e^x+\frac{1}{2}\,e^{(2\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((x+exp(x))^2,x, algorithm="fricas")
[Out] 1/3*x^3 + 2*(x - 1)*e^x + 1/2*e^(2*x)
```

giac [A] time = 0.22, size = 19, normalized size = 0.68

$$\frac{1}{3}\,x^3+2\,(x-1)e^x+\frac{1}{2}\,e^{(2\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((x+exp(x))^2,x, algorithm="giac")
[Out] 1/3*x^3 + 2*(x - 1)*e^x + 1/2*e^(2*x)
```

maple [A] time = 0.03, size = 22, normalized size = 0.79

$$\frac{x^3}{3}+2x\,\mathrm{e}^x-2\,\mathrm{e}^x+\frac{\mathrm{e}^{2x}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(x)+x)^2,x)
```

```
[Out] 1/3*x^3+1/2*exp(x)^2+2*exp(x)*x-2*exp(x)
```

maxima [A] time = 1.01, size = 19, normalized size = 0.68

$$\frac{1}{3}x^3 + 2(x-1)e^x + \frac{1}{2}e^{(2x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((x+exp(x))^2,x, algorithm="maxima")
```

```
[Out] 1/3*x^3 + 2*(x - 1)*e^x + 1/2*e^(2*x)
```

mupad [B] time = 3.50, size = 21, normalized size = 0.75

$$\frac{e^{2x}}{2} - 2e^x + 2xe^x + \frac{x^3}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x + exp(x))^2,x)
```

```
[Out] exp(2*x)/2 - 2*exp(x) + 2*x*exp(x) + x^3/3
```

sympy [A] time = 0.09, size = 20, normalized size = 0.71

$$\frac{x^3}{3} + \frac{(4x-4)e^x}{2} + \frac{e^{2x}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(x)+x)**2,x)
```

```
[Out] x**3/3 + (4*x - 4)*exp(x)/2 + exp(2*x)/2
```

3.675 $\int e^{-4x}\left(e^x+e^{2x}+e^{3x}\right)\,dx$

Optimal. Leaf size=26

$$-\frac{1}{3}e^{-3x}-\frac{e^{-2x}}{2}-e^{-x}$$

```
[Out] -1/3/exp(3*x)-1/2/exp(2*x)-1/exp(x)
```

Rubi [A] time = 0.02, antiderivative size = 26, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {2282, 14}

$$-\frac{1}{3}e^{-3x}-\frac{e^{-2x}}{2}-e^{-x}$$

Antiderivative was successfully verified.

```
[In] Int[(E^x + E^(2*x) + E^(3*x))/E^(4*x),x]
```

```
[Out] -1/(3*E^(3*x)) - 1/(2*E^(2*x)) - E^(-x)
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}\int e^{-4x}\left(e^x+e^{2x}+e^{3x}\right)\,dx&=\text{Subst}\left(\int\frac{1+x+x^2}{x^4}\,dx,x,e^x\right)\\&=\text{Subst}\left(\int\left(\frac{1}{x^4}+\frac{1}{x^3}+\frac{1}{x^2}\right)dx,x,e^x\right)\\&=-\frac{1}{3}e^{-3x}-\frac{e^{-2x}}{2}-e^{-x}\end{aligned}$$

Mathematica [A] time = 0.01, size = 23, normalized size = 0.88

$$-\frac{1}{6}e^{-3x}\left(3e^x+6e^{2x}+2\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^x + E^(2*x) + E^(3*x))/E^(4*x),x]
[Out] -1/6*(2 + 3*E^x + 6*E^(2*x))/E^(3*x)
```

fricas [A] time = 0.40, size = 18, normalized size = 0.69

$$-\frac{1}{6}\left(6\,e^{(2\,x)}+3\,e^x+2\right)e^{(-3\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(x)+exp(2*x)+exp(3*x))/exp(4*x),x, algorithm="fricas")
[Out] -1/6*(6*e^(2*x) + 3*e^x + 2)*e^(-3*x)
```

giac [A] time = 0.22, size = 18, normalized size = 0.69

$$-\frac{1}{6}\left(6\,e^{(2\,x)}+3\,e^x+2\right)e^{(-3\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(x)+exp(2*x)+exp(3*x))/exp(4*x),x, algorithm="giac")
[Out] -1/6*(6*e^(2*x) + 3*e^x + 2)*e^(-3*x)
```

maple [A] time = 0.03, size = 20, normalized size = 0.77

$$-\frac{e^{-3x}}{3}-\frac{e^{-2x}}{2}-e^{-x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(x)+exp(2*x)+exp(3*x))/exp(4*x),x)
[Out] -1/3/exp(x)^3-1/2/exp(x)^2-1/exp(x)
```

maxima [A] time = 0.89, size = 19, normalized size = 0.73

$$-e^{(-x)}-\frac{1}{2}\,e^{(-2\,x)}-\frac{1}{3}\,e^{(-3\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(x)+exp(2*x)+exp(3*x))/exp(4*x),x, algorithm="maxima")
[Out] -e^(-x) - 1/2*e^(-2*x) - 1/3*e^(-3*x)
```

mupad [B] time = 0.07, size = 18, normalized size = 0.69

$$-\frac{e^{-3x}\left(6e^{2x}+3e^{x}+2\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(-4*x)*(exp(2*x) + exp(3*x) + exp(x)),x)
[Out] -(exp(-3*x)*(6*exp(2*x) + 3*exp(x) + 2))/6
```

sympy [A] time = 0.11, size = 22, normalized size = 0.85

$$-e^{-x}-\frac{e^{-2x}}{2}-\frac{e^{-3x}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(x)+exp(2*x)+exp(3*x))/exp(4*x),x)
[Out] -exp(-x) - exp(-2*x)/2 - exp(-3*x)/3
```

3.676 $\int \frac{e^x}{1+2e^x+e^{2x}}\,dx$

Optimal. Leaf size=9

$$-\frac{1}{e^x+1}$$

```
[Out] -1/(1+exp(x))
```

Rubi [A] time = 0.02, antiderivative size = 9, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2282, 32}

$$-\frac{1}{e^x+1}$$

Antiderivative was successfully verified.

```
[In] Int[E^x/(1 + 2*E^x + E^(2*x)),x]
```

```
[Out] -(1 + E^x)^(-1)
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned} \int \frac{e^x}{1+2e^x+e^{2x}}\,dx &= \text{Subst}\left(\int \frac{1}{(1+x)^2}\,dx, x, e^x\right) \\ &= -\frac{1}{1+e^x} \end{aligned}$$

Mathematica [A] time = 0.01, size = 9, normalized size = 1.00

$$-\frac{1}{e^x+1}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x/(1 + 2*E^x + E^(2*x)),x]
[Out] -(1 + E^x)^(-1)
```

fricas [A] time = 0.39, size = 8, normalized size = 0.89

$$-\frac{1}{e^x+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1+2*exp(x)+exp(2*x)),x, algorithm="fricas")
[Out] -1/(e^x + 1)
```

giac [A] time = 0.20, size = 8, normalized size = 0.89

$$-\frac{1}{e^x+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1+2*exp(x)+exp(2*x)),x, algorithm="giac")
[Out] -1/(e^x + 1)
```

maple [A] time = 0.04, size = 9, normalized size = 1.00

$$-\frac{1}{\mathrm{e}^x+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(1+2*exp(x)+exp(2*x)),x)
[Out] -1/(exp(x)+1)
```

maxima [A] time = 0.89, size = 8, normalized size = 0.89

$$-\frac{1}{e^x+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1+2*exp(x)+exp(2*x)),x, algorithm="maxima")
[Out] -1/(e^x + 1)
```

mupad [B] time = 0.06, size = 8, normalized size = 0.89

$$-\frac{1}{\mathrm{e}^x+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(exp(2*x) + 2*exp(x) + 1),x)
[Out] -1/(exp(x) + 1)
```

sympy [A] time = 0.08, size = 7, normalized size = 0.78

$$-\frac{1}{e^x+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(1+2*exp(x)+exp(2*x)),x)
[Out] -1/(exp(x) + 1)
```

3.677 $\int e^{-x}\cos(3x)\,dx$

Optimal. Leaf size=27

$$\frac{3}{10}e^{-x}\sin(3x)-\frac{1}{10}e^{-x}\cos(3x)$$

```
[Out] -1/10*cos(3*x)/exp(x)+3/10*sin(3*x)/exp(x)
```

Rubi [A] time = 0.01, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {4433}

$$\frac{3}{10}e^{-x}\sin(3x)-\frac{1}{10}e^{-x}\cos(3x)$$

Antiderivative was successfully verified.

```
[In] Int[Cos[3*x]/E^x,x]
```

```
[Out] -Cos[3*x]/(10*E^x) + (3*Sin[3*x])/(10*E^x)
```

Rule 4433

```
Int[Cos[(d_.) + (e_.)*(x_)]*(F_)^((c_.)*((a_.) + (b_.)*(x_))), x_Symbol] :>
 Simp[(b*c*Log[F]*F^(c*(a + b*x))*Cos[d + e*x])/(e^2 + b^2*c^2*Log[F]^2), x
] + Simp[(e*F^(c*(a + b*x))*Sin[d + e*x])/(e^2 + b^2*c^2*Log[F]^2), x] /; F
reeQ[{F, a, b, c, d, e}, x] && NeQ[e^2 + b^2*c^2*Log[F]^2, 0]
```

Rubi steps

$$\int e^{-x}\cos(3x)\,dx=-\frac{1}{10}e^{-x}\cos(3x)+\frac{3}{10}e^{-x}\sin(3x)$$

Mathematica [A] time = 0.03, size = 20, normalized size = 0.74

$$-\frac{1}{10}e^{-x}(\cos(3x)-3\sin(3x))$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[3*x]/E^x,x]
```

```
[Out] -1/10*(Cos[3*x] - 3*Sin[3*x])/E^x
```

fricas [A] time = 0.41, size = 21, normalized size = 0.78

$$-\frac{1}{10}\cos\left(3\,x\right)e^{\left(-x\right)}+\frac{3}{10}\,e^{\left(-x\right)}\sin\left(3\,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(3*x)/exp(x),x, algorithm="fricas")
[Out] -1/10*cos(3*x)*e^(-x) + 3/10*e^(-x)*sin(3*x)
```

giac [A] time = 0.22, size = 17, normalized size = 0.63

$$-\frac{1}{10}\left(\cos\left(3\,x\right)-3\,\sin\left(3\,x\right)\right)e^{\left(-x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(3*x)/exp(x),x, algorithm="giac")
[Out] -1/10*(cos(3*x) - 3*sin(3*x))*e^(-x)
```

maple [A] time = 0.08, size = 22, normalized size = 0.81

$$-\frac{\cos\left(3x\right)\mathrm{e}^{-x}}{10}+\frac{3\,\mathrm{e}^{-x}\sin\left(3x\right)}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(3*x)/exp(x),x)
[Out] -1/10*exp(-x)*cos(3*x)+3/10*exp(-x)*sin(3*x)
```

maxima [A] time = 0.83, size = 17, normalized size = 0.63

$$-\frac{1}{10}\left(\cos\left(3\,x\right)-3\,\sin\left(3\,x\right)\right)e^{\left(-x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(3*x)/exp(x),x, algorithm="maxima")
[Out] -1/10*(cos(3*x) - 3*sin(3*x))*e^(-x)
```

mupad [B] time = 0.03, size = 17, normalized size = 0.63

$$-\frac{\mathrm{e}^{-x}\,\left(\cos\left(3\,x\right)-3\,\sin\left(3\,x\right)\right)}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(3*x)*exp(-x),x)
```

```
[Out] -(exp(-x)*(cos(3*x) - 3*sin(3*x)))/10
```

sympy **[A]** time = 0.44, size = 20, normalized size = 0.74

$$\frac{3e^{-x}\sin(3x)}{10} - \frac{e^{-x}\cos(3x)}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(3*x)/exp(x),x)
```

```
[Out] 3*exp(-x)*sin(3*x)/10 - exp(-x)*cos(3*x)/10
```

3.678 $\int \frac{e^{2x}}{2+3e^x+e^{2x}} dx$

Optimal. Leaf size=17

$$2\log(e^x+2)-\log(e^x+1)$$

```
[Out] -ln(1+exp(x))+2*ln(2+exp(x))
```

Rubi [A] time = 0.03, antiderivative size = 17, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.150, Rules used = {2282, 632, 31}

$$2\log(e^x+2)-\log(e^x+1)$$

Antiderivative was successfully verified.

```
[In] Int[E^(2*x)/(2 + 3*E^x + E^(2*x)),x]
```

```
[Out] -Log[1 + E^x] + 2*Log[2 + E^x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 632

```
Int[((d_.) + (e_.)*(x_))/((a_) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> W
ith[{q = Rt[b^2 - 4*a*c, 2]}, Dist[(c*d - e*(b/2 - q/2))/q, Int[1/(b/2 - q/
2 + c*x), x], x] - Dist[(c*d - e*(b/2 + q/2))/q, Int[1/(b/2 + q/2 + c*x), x
], x]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[2*c*d - b*e, 0] && NeQ[b^2 - 4*a
*c, 0] && NiceSqrtQ[b^2 - 4*a*c]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\int \frac{e^{2x}}{2+3e^x+e^{2x}}\,dx = \text{Subst}\left(\int \frac{x}{2+3x+x^2}\,dx, x, e^x\right)$$
$$= 2\,\text{Subst}\left(\int \frac{1}{2+x}\,dx, x, e^x\right) - \text{Subst}\left(\int \frac{1}{1+x}\,dx, x, e^x\right)$$
$$= -\log\left(1+e^x\right) + 2\log\left(2+e^x\right)$$

Mathematica [A] time = 0.01, size = 17, normalized size = 1.00

$$2\log\left(e^x+2\right) - \log\left(e^x+1\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(2*x)/(2 + 3*E^x + E^(2*x)),x]
[Out] -Log[1 + E^x] + 2*Log[2 + E^x]
```

fricas [A] time = 0.41, size = 15, normalized size = 0.88

$$2\ \log\left(e^x+2\right) - \log\left(e^x+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(2+3*exp(x)+exp(2*x)),x, algorithm="fricas")
[Out] 2*log(e^x + 2) - log(e^x + 1)
```

giac [A] time = 0.21, size = 15, normalized size = 0.88

$$2\ \log\left(e^x+2\right) - \log\left(e^x+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(2+3*exp(x)+exp(2*x)),x, algorithm="giac")
[Out] 2*log(e^x + 2) - log(e^x + 1)
```

maple [A] time = 0.04, size = 16, normalized size = 0.94

$$-\ln\left(\mathrm{e}^x+1\right) + 2\ln\left(\mathrm{e}^x+2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(2*x)/(2+3*exp(x)+exp(2*x)),x)
```

```
[Out] -ln(exp(x)+1)+2*ln(exp(x)+2)
```

maxima [A] time = 0.73, size = 15, normalized size = 0.88

$$2 \log \left(e^{x}+2\right)-\log \left(e^{x}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(2+3*exp(x)+exp(2*x)),x, algorithm="maxima")
[Out] 2*log(e^x + 2) - log(e^x + 1)
```

mupad [B] time = 3.54, size = 15, normalized size = 0.88

$$2 \ln \left(\mathrm{e}^{x}+2\right)-\ln \left(\mathrm{e}^{x}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(2*x)/(exp(2*x) + 3*exp(x) + 2),x)
[Out] 2*log(exp(x) + 2) - log(exp(x) + 1)
```

sympy [A] time = 0.12, size = 14, normalized size = 0.82

$$-\log \left(e^{x}+1\right)+2 \log \left(e^{x}+2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(2+3*exp(x)+exp(2*x)),x)
[Out] -log(exp(x) + 1) + 2*log(exp(x) + 2)
```

3.679 $\int \frac{e^{2x}}{1+e^x}\,dx$

Optimal. Leaf size=12

$$e^x - \log(e^x + 1)$$

[Out] exp(x)-ln(1+exp(x))

Rubi [A] time = 0.02, antiderivative size = 12, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2248, 43}

$$e^x - \log(e^x + 1)$$

Antiderivative was successfully verified.

[In] Int[E^(2*x)/(1 + E^x),x]

[Out] E^x - Log[1 + E^x]

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2248

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(g*h*Log[G])/(d*e*Lo
g[F])]}, Dist[(Denominator[m]*G^(f*h - (c*g*h)/d))/(d*e*Log[F]), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^((e*(c + d*x))/De
nominator[m])], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{e^{2x}}{1+e^x}\,dx &= \text{Subst}\left(\int \frac{x}{1+x}\,dx, x, e^x\right)\\
&= \text{Subst}\left(\int \left(1+\frac{1}{-1-x}\right)dx, x, e^x\right)\\
&= e^x - \log(1+e^x)
\end{aligned}$$

Mathematica [A] time = 0.01, size = 12, normalized size = 1.00

$$e^x - \log(e^x + 1)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(2*x)/(1 + E^x),x]
[Out] E^x - Log[1 + E^x]
```

fricas [A] time = 0.41, size = 10, normalized size = 0.83

$$e^x - \log(e^x + 1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(1+exp(x)),x, algorithm="fricas")
[Out] e^x - log(e^x + 1)
```

giac [A] time = 0.21, size = 10, normalized size = 0.83

$$e^x - \log(e^x + 1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(1+exp(x)),x, algorithm="giac")
[Out] e^x - log(e^x + 1)
```

maple [A] time = 0.03, size = 11, normalized size = 0.92

$$e^x - \ln(e^x + 1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(2*x)/(exp(x)+1),x)
[Out] exp(x)-ln(exp(x)+1)
```

maxima [A] time = 0.88, size = 10, normalized size = 0.83

$$e^x - \log(e^x + 1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(1+exp(x)),x, algorithm="maxima")
[Out] e^x - log(e^x + 1)
```

mupad [B] time = 3.54, size = 10, normalized size = 0.83

$$\mathrm{e}^{x} - \ln\left(\mathrm{e}^{x} + 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(2*x)/(exp(x) + 1),x)
[Out] exp(x) - log(exp(x) + 1)
```

sympy [A] time = 0.09, size = 8, normalized size = 0.67

$$e^{x} - \log\left(e^{x} + 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(1+exp(x)),x)
[Out] exp(x) - log(exp(x) + 1)
```

3.680 $\int e^{3x}\cos(5x)\,dx$

Optimal. Leaf size=27

$$\frac{5}{34}e^{3x}\sin(5x)+\frac{3}{34}e^{3x}\cos(5x)$$

```
[Out] 3/34*exp(3*x)*cos(5*x)+5/34*exp(3*x)*sin(5*x)
```

Rubi [A] time = 0.01, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {4433}

$$\frac{5}{34}e^{3x}\sin(5x)+\frac{3}{34}e^{3x}\cos(5x)$$

Antiderivative was successfully verified.

```
[In] Int[E^(3*x)*Cos[5*x],x]
[Out] (3*E^(3*x)*Cos[5*x])/34 + (5*E^(3*x)*Sin[5*x])/34
```

Rule 4433

```
Int[Cos[(d_.) + (e_.)*(x_)]*(F_)^((c_.)*((a_.) + (b_.)*(x_))), x_Symbol] :>
 Simp[(b*c*Log[F]*F^(c*(a + b*x))*Cos[d + e*x])/(e^2 + b^2*c^2*Log[F]^2), x
] + Simp[(e*F^(c*(a + b*x))*Sin[d + e*x])/(e^2 + b^2*c^2*Log[F]^2), x] /; F
reeQ[{F, a, b, c, d, e}, x] && NeQ[e^2 + b^2*c^2*Log[F]^2, 0]
```

Rubi steps

$$\int e^{3x}\cos(5x)\,dx=\frac{3}{34}e^{3x}\cos(5x)+\frac{5}{34}e^{3x}\sin(5x)$$

Mathematica [A] time = 0.03, size = 22, normalized size = 0.81

$$\frac{1}{34}e^{3x}(5\sin(5x)+3\cos(5x))$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(3*x)*Cos[5*x],x]
[Out] (E^(3*x)*(3*Cos[5*x] + 5*Sin[5*x]))/34
```

fricas [A] time = 0.42, size = 21, normalized size = 0.78

$$\frac{3}{34}\cos\left(5x\right)e^{(3x)}+\frac{5}{34}e^{(3x)}\sin\left(5x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(3*x)*cos(5*x),x, algorithm="fricas")
[Out] 3/34*cos(5*x)*e^(3*x) + 5/34*e^(3*x)*sin(5*x)
```

giac [A] time = 0.21, size = 19, normalized size = 0.70

$$\frac{1}{34}\left(3\cos\left(5x\right)+5\sin\left(5x\right)\right)e^{(3x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(3*x)*cos(5*x),x, algorithm="giac")
[Out] 1/34*(3*cos(5*x) + 5*sin(5*x))*e^(3*x)
```

maple [A] time = 0.08, size = 22, normalized size = 0.81

$$\frac{3\cos\left(5x\right)\mathrm{e}^{3x}}{34}+\frac{5\,\mathrm{e}^{3x}\sin\left(5x\right)}{34}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(3*x)*cos(5*x),x)
[Out] 3/34*exp(3*x)*cos(5*x)+5/34*exp(3*x)*sin(5*x)
```

maxima [A] time = 0.75, size = 19, normalized size = 0.70

$$\frac{1}{34}\left(3\cos\left(5x\right)+5\sin\left(5x\right)\right)e^{(3x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(3*x)*cos(5*x),x, algorithm="maxima")
[Out] 1/34*(3*cos(5*x) + 5*sin(5*x))*e^(3*x)
```

mupad [B] time = 0.03, size = 19, normalized size = 0.70

$$\frac{\mathrm{e}^{3x}\left(3\cos\left(5x\right)+5\sin\left(5x\right)\right)}{34}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(5*x)*exp(3*x),x)
```

```
[Out] (exp(3*x)*(3*cos(5*x) + 5*sin(5*x)))/34
```

sympy [A] time = 0.30, size = 26, normalized size = 0.96

$$\frac{5e^{3x}\sin{(5x)}}{34} + \frac{3e^{3x}\cos{(5x)}}{34}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(3*x)*cos(5*x),x)
```

```
[Out] 5*exp(3*x)*sin(5*x)/34 + 3*exp(3*x)*cos(5*x)/34
```

3.681 $\int e^x \text{sech}(e^x)\, dx$

Optimal. Leaf size=5

$$\tan^{-1}(\sinh(e^x))$$

```
[Out] arctan(sinh(exp(x)))
```

Rubi [A] time = 0.01, antiderivative size = 5, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {2282, 3770}

$$\tan^{-1}(\sinh(e^x))$$

Antiderivative was successfully verified.

```
[In] Int[E^x*Sech[E^x],x]
```

```
[Out] ArcTan[Sinh[E^x]]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned} \int e^x \text{sech}(e^x)\, dx &= \text{Subst}\left(\int \text{sech}(x)\, dx, x, e^x\right) \\ &= \tan^{-1}(\sinh(e^x)) \end{aligned}$$

Mathematica [A] time = 0.01, size = 5, normalized size = 1.00

$$\tan^{-1}(\sinh(e^x))$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x*Sech[E^x],x]
```

```
[Out] ArcTan[Sinh[E^x]]
```

fricas [B] time = 0.39, size = 16, normalized size = 3.20

$$2 \arctan\left(\cosh\left(\cosh(x) + \sinh(x)\right) + \sinh\left(\cosh(x) + \sinh(x)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*sech(exp(x)),x, algorithm="fricas")
```

```
[Out] 2*arctan(cosh(cosh(x) + sinh(x)) + sinh(cosh(x) + sinh(x)))
```

giac [A] time = 0.21, size = 6, normalized size = 1.20

$$2 \arctan\left(e^{\left(e^{x}\right)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*sech(exp(x)),x, algorithm="giac")
```

```
[Out] 2*arctan(e^(e^x))
```

maple [A] time = 0.03, size = 5, normalized size = 1.00

$$\arctan\left(\sinh\left(\mathrm{e}^{x}\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*sech(exp(x)),x)
```

```
[Out] arctan(sinh(exp(x)))
```

maxima [A] time = 0.87, size = 4, normalized size = 0.80

$$\arctan\left(\sinh\left(e^{x}\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*sech(exp(x)),x, algorithm="maxima")
```

```
[Out] arctan(sinh(e^x))
```

mupad [B] time = 0.05, size = 6, normalized size = 1.20

$$2\,\mathrm{atan}\left({\mathrm{e}}^{{\mathrm{e}}^x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/cosh(exp(x)),x)
```

```
[Out] 2*atan(exp(exp(x)))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int e^{x}\operatorname{sech}\left(e^{x}\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*sech(exp(x)),x)
```

```
[Out] Integral(exp(x)*sech(exp(x)), x)
```

3.682 $\int \frac{e^{-x}}{1+2e^x} \, dx$

Optimal. Leaf size=21

$$-2x - e^{-x} + 2\log(2e^x + 1)$$

```
[Out] -1/exp(x)-2*x+2*ln(1+2*exp(x))
```

Rubi [A] time = 0.03, antiderivative size = 21, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$, Rules used = {2248, 44}

$$-2x - e^{-x} + 2\log(2e^x + 1)$$

Antiderivative was successfully verified.

```
[In] Int[1/(E^x*(1 + 2*E^x)),x]
```

```
[Out] -E^(-x) - 2*x + 2*Log[1 + 2*E^x]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2248

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(g*h*Log[G])/(d*e*Lo
g[F])]}, Dist[(Denominator[m]*G^(f*h - (c*g*h)/d))/(d*e*Log[F]), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^((e*(c + d*x))/De
nominator[m])], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{e^{-x}}{1+2e^x} \, dx &= \text{Subst}\left(\int \frac{1}{x^2(1+2x)} \, dx, x, e^x\right) \\
&= \text{Subst}\left(\int \left(\frac{1}{x^2} - \frac{2}{x} + \frac{4}{1+2x}\right) dx, x, e^x\right) \\
&= -e^{-x} - 2x + 2\log(1+2e^x)
\end{aligned}$$

Mathematica [A] time = 0.02, size = 21, normalized size = 1.00

$$-2x - e^{-x} + 2\log(2e^x + 1)$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(E^x*(1 + 2*E^x)),x]
[Out] -E^(-x) - 2*x + 2*Log[1 + 2*E^x]
```

fricas [A] time = 0.41, size = 24, normalized size = 1.14

$$-\left(2\,xe^x - 2\,e^x\log(2\,e^x + 1) + 1\right)e^{(-x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/exp(x)/(1+2*exp(x)),x, algorithm="fricas")
[Out] -(2*x*e^x - 2*e^x*log(2*e^x + 1) + 1)*e^(-x)
```

giac [A] time = 0.21, size = 19, normalized size = 0.90

$$-2\,x - e^{(-x)} + 2\,\log(2\,e^x + 1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/exp(x)/(1+2*exp(x)),x, algorithm="giac")
[Out] -2*x - e^(-x) + 2*log(2*e^x + 1)
```

maple [A] time = 0.03, size = 22, normalized size = 1.05

$$-e^{-x} + 2\ln(2\,e^x + 1) - 2\ln(e^x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/exp(x)/(2*exp(x)+1),x)
[Out] 2*ln(2*exp(x)+1)-1/exp(x)-2*ln(exp(x))
```

maxima [A] time = 0.98, size = 16, normalized size = 0.76

$$-e^{(-x)} + 2\,\log\left(e^{(-x)} + 2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/exp(x)/(1+2*exp(x)),x, algorithm="maxima")
```

```
[Out] -e^(-x) + 2*log(e^(-x) + 2)
```

mupad [B] time = 0.07, size = 19, normalized size = 0.90

$$2\,\ln\left(2\,e^x+1\right)-2\,x-e^{-x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(-x)/(2*exp(x) + 1),x)
[Out] 2*log(2*exp(x) + 1) - 2*x - exp(-x)
```

sympy [A] time = 0.10, size = 17, normalized size = 0.81

$$-2x+2\log\left(e^x+\frac{1}{2}\right)-e^{-x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/exp(x)/(1+2*exp(x)),x)
[Out] -2*x + 2*log(exp(x) + 1/2) - exp(-x)
```

3.683 $\int e^x \cos(4+3x)\,dx$

Optimal. Leaf size=27

$$\frac{3}{10}e^x\sin(3x+4)+\frac{1}{10}e^x\cos(3x+4)$$

```
[Out] 1/10*exp(x)*cos(4+3*x)+3/10*exp(x)*sin(4+3*x)
```

Rubi [A] time = 0.01, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {4433}

$$\frac{3}{10}e^x\sin(3x+4)+\frac{1}{10}e^x\cos(3x+4)$$

Antiderivative was successfully verified.

```
[In] Int[E^x*Cos[4 + 3*x],x]
[Out] (E^x*Cos[4 + 3*x])/10 + (3*E^x*Sin[4 + 3*x])/10
```

Rule 4433

```
Int[Cos[(d_.) + (e_.)*(x_)]*(F_)^((c_.)*((a_.) + (b_.)*(x_))), x_Symbol] :>
 Simp[(b*c*Log[F]*F^(c*(a + b*x))*Cos[d + e*x])/(e^2 + b^2*c^2*Log[F]^2), x
] + Simp[(e*F^(c*(a + b*x))*Sin[d + e*x])/(e^2 + b^2*c^2*Log[F]^2), x] /; F
reeQ[{F, a, b, c, d, e}, x] && NeQ[e^2 + b^2*c^2*Log[F]^2, 0]
```

Rubi steps

$$\int e^x\cos(4+3x)\,dx=\frac{1}{10}e^x\cos(4+3x)+\frac{3}{10}e^x\sin(4+3x)$$

Mathematica [A] time = 0.04, size = 22, normalized size = 0.81

$$\frac{1}{10}e^x(3\sin(3x+4)+\cos(3x+4))$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x*Cos[4 + 3*x],x]
[Out] (E^x*(Cos[4 + 3*x] + 3*Sin[4 + 3*x]))/10
```

fricas [A]   time = 0.40, size = 21, normalized size = 0.78

$$\frac{1}{10}\cos\left(3\,x+4\right)e^{x}+\frac{3}{10}\,e^{x}\sin\left(3\,x+4\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*cos(4+3*x),x, algorithm="fricas")
[Out] 1/10*cos(3*x + 4)*e^x + 3/10*e^x*sin(3*x + 4)
```

giac [A]   time = 0.18, size = 19, normalized size = 0.70

$$\frac{1}{10}\left(\cos\left(3\,x+4\right)+3\,\sin\left(3\,x+4\right)\right)e^{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*cos(4+3*x),x, algorithm="giac")
[Out] 1/10*(cos(3*x + 4) + 3*sin(3*x + 4))*e^x
```

maple [A]   time = 0.12, size = 22, normalized size = 0.81

$$\frac{\cos\left(3x+4\right)\mathrm{e}^{x}}{10}+\frac{3\,\mathrm{e}^{x}\sin\left(3x+4\right)}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*cos(4+3*x),x)
[Out] 1/10*exp(x)*cos(4+3*x)+3/10*exp(x)*sin(4+3*x)
```

maxima [A]   time = 0.86, size = 19, normalized size = 0.70

$$\frac{1}{10}\left(\cos\left(3\,x+4\right)+3\,\sin\left(3\,x+4\right)\right)e^{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*cos(4+3*x),x, algorithm="maxima")
[Out] 1/10*(cos(3*x + 4) + 3*sin(3*x + 4))*e^x
```

mupad [B]   time = 3.53, size = 19, normalized size = 0.70

$$\frac{\mathrm{e}^{x}\,\left(\cos\left(3\,x+4\right)+3\,\sin\left(3\,x+4\right)\right)}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*cos(3*x + 4),x)
```

```
[Out] (exp(x)*(cos(3*x + 4) + 3*sin(3*x + 4)))/10
```

sympy [A] time = 0.29, size = 24, normalized size = 0.89

$$\frac{3e^x \sin{(3x + 4)}}{10} + \frac{e^x \cos{(3x + 4)}}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*cos(4+3*x),x)
```

```
[Out] 3*exp(x)*sin(3*x + 4)/10 + exp(x)*cos(3*x + 4)/10
```

3.684 $\int e^x \sec^3(1 - e^x)\, dx$

Optimal. Leaf size=34

$$-\frac{1}{2}\tanh^{-1}(\sin(1-e^x)) - \frac{1}{2}\tan(1-e^x)\sec(1-e^x)$$

```
[Out] 1/2*arctanh(sin(-1+exp(x)))+1/2*sec(-1+exp(x))*tan(-1+exp(x))
```

Rubi [A] time = 0.03, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.214, Rules used = {2282, 3768, 3770}

$$-\frac{1}{2}\tanh^{-1}(\sin(1-e^x)) - \frac{1}{2}\tan(1-e^x)\sec(1-e^x)$$

Antiderivative was successfully verified.

```
[In] Int[E^x*Sec[1 - E^x]^3,x]
```

```
[Out] -ArcTanh[Sin[1 - E^x]]/2 - (Sec[1 - E^x]*Tan[1 - E^x])/2
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 3768

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> -Simp[(b*Cos[c + d*x
]*(b*Csc[c + d*x])^(n - 1))/(d*(n - 1)), x] + Dist[(b^2*(n - 2))/(n - 1), I
nt[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &&
IntegerQ[2*n]
```

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\int e^x \sec^3(1-e^x)\,dx = \text{Subst}\left(\int \sec^3(1-x)\,dx, x, e^x\right)$$
$$= -\frac{1}{2}\sec(1-e^x)\tan(1-e^x) + \frac{1}{2}\text{Subst}\left(\int \sec(1-x)\,dx, x, e^x\right)$$
$$= -\frac{1}{2}\tanh^{-1}(\sin(1-e^x)) - \frac{1}{2}\sec(1-e^x)\tan(1-e^x)$$

Mathematica [A] time = 0.02, size = 34, normalized size = 1.00

$$-\frac{1}{2}\tanh^{-1}(\sin(1-e^x)) - \frac{1}{2}\tan(1-e^x)\sec(1-e^x)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x*Sec[1 - E^x]^3,x]
```

```
[Out] -1/2*ArcTanh[Sin[1 - E^x]] - (Sec[1 - E^x]*Tan[1 - E^x])/2
```

fricas [B] time = 0.43, size = 52, normalized size = 1.53

$$\frac{\cos(e^x-1)^2\log(\sin(e^x-1)+1) - \cos(e^x-1)^2\log(-\sin(e^x-1)+1) + 2\,\sin(e^x-1)}{4\,\cos(e^x-1)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*sec(-1+exp(x))^3,x, algorithm="fricas")
```

```
[Out] 1/4*(cos(e^x - 1)^2*log(sin(e^x - 1) + 1) - cos(e^x - 1)^2*log(-sin(e^x - 1
) + 1) + 2*sin(e^x - 1))/cos(e^x - 1)^2
```

giac [A] time = 0.20, size = 41, normalized size = 1.21

$$-\frac{\sin(e^x-1)}{2\left(\sin(e^x-1)^2-1\right)} + \frac{1}{4}\,\log(\sin(e^x-1)+1) - \frac{1}{4}\,\log(-\sin(e^x-1)+1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*sec(-1+exp(x))^3,x, algorithm="giac")
```

```
[Out] -1/2*sin(e^x - 1)/(sin(e^x - 1)^2 - 1) + 1/4*log(sin(e^x - 1) + 1) - 1/4*lo
g(-sin(e^x - 1) + 1)
```

maple [A] time = 0.37, size = 28, normalized size = 0.82

$$\frac{\sec(e^x-1)\tan(e^x-1)}{2} + \frac{\ln(\sec(e^x-1)+\tan(e^x-1))}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*sec(exp(x)-1)^3,x)
```

```
[Out] 1/2*sec(exp(x)-1)*tan(exp(x)-1)+1/2*ln(sec(exp(x)-1)+tan(exp(x)-1))
```

maxima [A] time = 1.09, size = 39, normalized size = 1.15

$$-\frac{\sin\left(e^{x}-1\right)}{2\left(\sin\left(e^{x}-1\right)^{2}-1\right)}+\frac{1}{4}\log\left(\sin\left(e^{x}-1\right)+1\right)-\frac{1}{4}\log\left(\sin\left(e^{x}-1\right)-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*sec(-1+exp(x))^3,x, algorithm="maxima")
```

```
[Out] -1/2*sin(e^x - 1)/(sin(e^x - 1)^2 - 1) + 1/4*log(sin(e^x - 1) + 1) - 1/4*lo
g(sin(e^x - 1) - 1)
```

mupad [B] time = 5.53, size = 78, normalized size = 2.29

$$-\mathrm{atan}\left(\mathrm{e}^{-\mathrm{i}}\,\mathrm{e}^{\mathrm{e}^{x}\,1\mathrm{i}}\right)\,1\mathrm{i}-\frac{\mathrm{e}^{-\mathrm{i}}\,\mathrm{e}^{\mathrm{e}^{x}\,1\mathrm{i}}\,1\mathrm{i}}{\mathrm{e}^{-2\mathrm{i}}\,\mathrm{e}^{\mathrm{e}^{x}\,2\mathrm{i}}+1}+\frac{\mathrm{e}^{-\mathrm{i}}\,\mathrm{e}^{\mathrm{e}^{x}\,1\mathrm{i}}\,2\mathrm{i}}{2\,\mathrm{e}^{-2\mathrm{i}}\,\mathrm{e}^{\mathrm{e}^{x}\,2\mathrm{i}}+\mathrm{e}^{-4\mathrm{i}}\,\mathrm{e}^{\mathrm{e}^{x}\,4\mathrm{i}}+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/cos(exp(x) - 1)^3,x)
```

```
[Out] (exp(-1i)*exp(exp(x)*1i)*2i)/(2*exp(-2i)*exp(exp(x)*2i) + exp(-4i)*exp(exp(
x)*4i) + 1) - (exp(-1i)*exp(exp(x)*1i)*1i)/(exp(-2i)*exp(exp(x)*2i) + 1) -
atan(exp(-1i)*exp(exp(x)*1i))*1i
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int e^{x}\sec^{3}\left(e^{x}-1\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*sec(-1+exp(x))**3,x)
```

```
[Out] Integral(exp(x)*sec(exp(x) - 1)**3, x)
```

3.685 $\int (e^{-x} + e^x)\, x\, dx$

Optimal. Leaf size=26

$$-e^{-x}x + e^x x - e^{-x} - e^x$$

```
[Out] -1/exp(x)-exp(x)-x/exp(x)+exp(x)*x
```

Rubi [A] time = 0.02, antiderivative size = 26, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 3, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {14, 2176, 2194}

$$-e^{-x}x + e^x x - e^{-x} - e^x$$

Antiderivative was successfully verified.

```
[In] Int[(E^(-x) + E^x)*x,x]
```

```
[Out] -E^(-x) - E^x - x/E^x + E^x*x
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2176

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_.), x_Symbol] :> Simp[((c + d*x)^m*(b*F^(g*(e + f*x)))^n)/(f*g*n*Log[F]),
x] - Dist[(d*m)/(f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*(b*F^(g*(e + f*x)))^n
, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && GtQ[m, 0] && IntegerQ[2*m
] &&  !$UseGamma === True
```

Rule 2194

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rubi steps

$$
\begin{aligned}
\int (e^{-x}+e^{x})\,x\,dx &= \int \left(e^{-x}x+e^{x}x\right)\,dx\\
&= \int e^{-x}x\,dx+\int e^{x}x\,dx\\
&= -e^{-x}x+e^{x}x+\int e^{-x}\,dx-\int e^{x}\,dx\\
&= -e^{-x}-e^{x}-e^{-x}x+e^{x}x
\end{aligned}
$$

Mathematica [A] time = 0.02, size = 20, normalized size = 0.77

$$e^{-x}\left(e^{2x}(x-1)-x-1\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^(-x) + E^x)*x,x]
[Out] (-1 + E^(2*x)*(-1 + x) - x)/E^x
```

fricas [A] time = 0.40, size = 18, normalized size = 0.69

$$\left((x-1)e^{(2\,x)}-x-1\right)e^{(-x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(-x)+exp(x))*x,x, algorithm="fricas")
[Out] ((x - 1)*e^(2*x) - x - 1)*e^(-x)
```

giac [A] time = 0.18, size = 16, normalized size = 0.62

$$-(x+1)e^{(-x)}+(x-1)e^{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(-x)+exp(x))*x,x, algorithm="giac")
[Out] -(x + 1)*e^(-x) + (x - 1)*e^x
```

maple [A] time = 0.03, size = 23, normalized size = 0.88

$$x\,\mathrm{e}^{x}-x\,\mathrm{e}^{-x}-\mathrm{e}^{x}-\mathrm{e}^{-x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(-x)+exp(x))*x,x)
```

```
[Out] -1/exp(x)-exp(x)-x/exp(x)+x*exp(x)
```

maxima [A] time = 0.82, size = 16, normalized size = 0.62

$$-(x+1)e^{(-x)} + (x-1)e^{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(-x)+exp(x))*x,x, algorithm="maxima")
[Out] -(x + 1)*e^(-x) + (x - 1)*e^x
```

mupad [B] time = 0.06, size = 10, normalized size = 0.38

$$2\,x\sinh(x) - 2\cosh(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(exp(-x) + exp(x)),x)
[Out] 2*x*sinh(x) - 2*cosh(x)
```

sympy [A] time = 0.10, size = 14, normalized size = 0.54

$$(-x-1)\,e^{-x} + (x-1)\,e^{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(-x)+exp(x))*x,x)
[Out] (-x - 1)*exp(-x) + (x - 1)*exp(x)
```

3.686 $\int \frac{e^x}{2+3e^x+e^{2x}}\,dx$

Optimal. Leaf size=15

$$\log\left(e^x+1\right)-\log\left(e^x+2\right)$$

[Out] ln(1+exp(x))-ln(2+exp(x))

Rubi [A] time = 0.03, antiderivative size = 15, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {2282, 616, 31}

$$\log\left(e^x+1\right)-\log\left(e^x+2\right)$$

Antiderivative was successfully verified.

[In] Int[E^x/(2 + 3*E^x + E^(2*x)),x]

[Out] Log[1 + E^x] - Log[2 + E^x]

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 616

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> With[{q = Rt[b^2
 - 4*a*c, 2]}, Dist[c/q, Int[1/Simp[b/2 - q/2 + c*x, x], x], x] - Dist[c/q,
 Int[1/Simp[b/2 + q/2 + c*x, x], x], x]] /; FreeQ[{a, b, c}, x] && NeQ[b^2
- 4*a*c, 0] && PosQ[b^2 - 4*a*c] && PerfectSquareQ[b^2 - 4*a*c]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$
\begin{aligned}
\int \frac{e^x}{2+3e^x+e^{2x}}\,dx &= \text{Subst}\left(\int \frac{1}{2+3x+x^2}\,dx, x, e^x\right) \\
&= \text{Subst}\left(\int \frac{1}{1+x}\,dx, x, e^x\right) - \text{Subst}\left(\int \frac{1}{2+x}\,dx, x, e^x\right) \\
&= \log(1+e^x) - \log(2+e^x)
\end{aligned}
$$

Mathematica [**A**] time = 0.01, size = 10, normalized size = 0.67

$$-2\tanh^{-1}(2e^x+3)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x/(2 + 3*E^x + E^(2*x)),x]
```

```
[Out] -2*ArcTanh[3 + 2*E^x]
```

fricas [**A**] time = 0.41, size = 13, normalized size = 0.87

$$-\log(e^x+2)+\log(e^x+1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(2+3*exp(x)+exp(2*x)),x, algorithm="fricas")
```

```
[Out] -log(e^x + 2) + log(e^x + 1)
```

giac [**A**] time = 0.21, size = 13, normalized size = 0.87

$$-\log(e^x+2)+\log(e^x+1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(2+3*exp(x)+exp(2*x)),x, algorithm="giac")
```

```
[Out] -log(e^x + 2) + log(e^x + 1)
```

maple [**A**] time = 0.04, size = 14, normalized size = 0.93

$$\ln(\mathrm{e}^x+1)-\ln(\mathrm{e}^x+2)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(2+3*exp(x)+exp(2*x)),x)
```

```
[Out] ln(exp(x)+1)-ln(exp(x)+2)
```

maxima [A] time = 1.03, size = 13, normalized size = 0.87

$$-\log(e^x+2)+\log(e^x+1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(2+3*exp(x)+exp(2*x)),x, algorithm="maxima")
[Out] -log(e^x + 2) + log(e^x + 1)
```

mupad [B] time = 3.49, size = 13, normalized size = 0.87

$$\ln(\mathrm{e}^x+1)-\ln(\mathrm{e}^x+2)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(exp(2*x) + 3*exp(x) + 2),x)
[Out] log(exp(x) + 1) - log(exp(x) + 2)
```

sympy [A] time = 0.12, size = 12, normalized size = 0.80

$$\log(e^x+1)-\log(e^x+2)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(2+3*exp(x)+exp(2*x)),x)
[Out] log(exp(x) + 1) - log(exp(x) + 2)
```

3.687 $\int \frac{e^{2x}}{\sqrt[3]{1+e^x}}\,dx$

Optimal. Leaf size=27

$$\frac{3}{5}\left(e^x+1\right)^{5/3}-\frac{3}{2}\left(e^x+1\right)^{2/3}$$

```
[Out] -3/2*(1+exp(x))^(2/3)+3/5*(1+exp(x))^(5/3)
```

Rubi [A] time = 0.03, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {2248, 43}

$$\frac{3}{5}\left(e^x+1\right)^{5/3}-\frac{3}{2}\left(e^x+1\right)^{2/3}$$

Antiderivative was successfully verified.

```
[In] Int[E^(2*x)/(1 + E^x)^(1/3),x]
```

```
[Out] (-3*(1 + E^x)^(2/3))/2 + (3*(1 + E^x)^(5/3))/5
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2248

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(g*h*Log[G])/(d*e*Lo
g[F])]}, Dist[(Denominator[m]*G^(f*h - (c*g*h)/d))/(d*e*Log[F]), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^((e*(c + d*x))/De
nominator[m])], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int \frac{e^{2x}}{\sqrt[3]{1+e^x}}\,dx = \text{Subst}\left(\int \frac{x}{\sqrt[3]{1+x}}\,dx, x, e^x\right)$$
$$= \text{Subst}\left(\int \left(-\frac{1}{\sqrt[3]{1+x}} + (1+x)^{2/3}\right) dx, x, e^x\right)$$
$$= -\frac{3}{2}(1+e^x)^{2/3} + \frac{3}{5}(1+e^x)^{5/3}$$

Mathematica [A] time = 0.01, size = 20, normalized size = 0.74

$$\frac{3}{10}(e^x+1)^{2/3}(2e^x-3)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(2*x)/(1 + E^x)^(1/3),x]
[Out] (3*(1 + E^x)^(2/3)*(-3 + 2*E^x))/10
```

fricas [A] time = 0.39, size = 14, normalized size = 0.52

$$\frac{3}{10}(2e^x-3)(e^x+1)^{\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(1+exp(x))^(1/3),x, algorithm="fricas")
[Out] 3/10*(2*e^x - 3)*(e^x + 1)^(2/3)
```

giac [A] time = 0.21, size = 17, normalized size = 0.63

$$\frac{3}{5}(e^x+1)^{\frac{5}{3}} - \frac{3}{2}(e^x+1)^{\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(1+exp(x))^(1/3),x, algorithm="giac")
[Out] 3/5*(e^x + 1)^(5/3) - 3/2*(e^x + 1)^(2/3)
```

maple [A] time = 0.03, size = 18, normalized size = 0.67

$$-\frac{3(\mathrm{e}^x+1)^{\frac{2}{3}}}{2} + \frac{3(\mathrm{e}^x+1)^{\frac{5}{3}}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(2*x)/(exp(x)+1)^(1/3),x)
```

```
[Out] -3/2*(exp(x)+1)^(2/3)+3/5*(exp(x)+1)^(5/3)
```

maxima [A] time = 1.01, size = 17, normalized size = 0.63

$$\frac{3}{5}\left(e^{x}+1\right)^{\frac{5}{3}}-\frac{3}{2}\left(e^{x}+1\right)^{\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(1+exp(x))^(1/3),x, algorithm="maxima")
```

```
[Out] 3/5*(e^x + 1)^(5/3) - 3/2*(e^x + 1)^(2/3)
```

mupad [B] time = 0.06, size = 14, normalized size = 0.52

$$\frac{3\left(e^{x}+1\right)^{2/3}\left(2e^{x}-3\right)}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(2*x)/(exp(x) + 1)^(1/3),x)
```

```
[Out] (3*(exp(x) + 1)^(2/3)*(2*exp(x) - 3))/10
```

sympy [A] time = 1.99, size = 22, normalized size = 0.81

$$\frac{3\left(e^{x}+1\right)^{\frac{5}{3}}}{5}-\frac{3\left(e^{x}+1\right)^{\frac{2}{3}}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(1+exp(x))**(1/3),x)
```

```
[Out] 3*(exp(x) + 1)**(5/3)/5 - 3*(exp(x) + 1)**(2/3)/2
```

3.688 $\int \frac{e^{2x}}{\sqrt[4]{1+e^x}}\,dx$

Optimal. Leaf size=27

$$\frac{4}{7}\left(e^x+1\right)^{7/4}-\frac{4}{3}\left(e^x+1\right)^{3/4}$$

```
[Out] -4/3*(1+exp(x))^(3/4)+4/7*(1+exp(x))^(7/4)
```

Rubi [A] time = 0.03, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {2248, 43}

$$\frac{4}{7}\left(e^x+1\right)^{7/4}-\frac{4}{3}\left(e^x+1\right)^{3/4}$$

Antiderivative was successfully verified.

```
[In] Int[E^(2*x)/(1 + E^x)^(1/4),x]
```

```
[Out] (-4*(1 + E^x)^(3/4))/3 + (4*(1 + E^x)^(7/4))/7
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2248

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(g*h*Log[G])/(d*e*Lo
g[F])]}, Dist[(Denominator[m]*G^(f*h - (c*g*h)/d))/(d*e*Log[F]), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^((e*(c + d*x))/De
nominator[m])], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{e^{2x}}{\sqrt[4]{1+e^x}}\,dx &= \text{Subst}\left(\int \frac{x}{\sqrt[4]{1+x}}\,dx, x, e^x\right)\\ &= \text{Subst}\left(\int \left(-\frac{1}{\sqrt[4]{1+x}}+(1+x)^{3/4}\right)dx, x, e^x\right)\\ &= -\frac{4}{3}\left(1+e^x\right)^{3/4}+\frac{4}{7}\left(1+e^x\right)^{7/4}\end{aligned}$$

Mathematica [A] time = 0.01, size = 20, normalized size = 0.74

$$\frac{4}{21}\left(e^x+1\right)^{3/4}\left(3e^x-4\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(2*x)/(1 + E^x)^(1/4),x]
[Out] (4*(1 + E^x)^(3/4)*(-4 + 3*E^x))/21
```

fricas [A] time = 0.39, size = 14, normalized size = 0.52

$$\frac{4}{21}\left(3\,e^x-4\right)\left(e^x+1\right)^{\frac{3}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(1+exp(x))^(1/4),x, algorithm="fricas")
[Out] 4/21*(3*e^x - 4)*(e^x + 1)^(3/4)
```

giac [A] time = 0.21, size = 17, normalized size = 0.63

$$\frac{4}{7}\left(e^x+1\right)^{\frac{7}{4}}-\frac{4}{3}\left(e^x+1\right)^{\frac{3}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(1+exp(x))^(1/4),x, algorithm="giac")
[Out] 4/7*(e^x + 1)^(7/4) - 4/3*(e^x + 1)^(3/4)
```

maple [A] time = 0.03, size = 18, normalized size = 0.67

$$-\frac{4\left(\mathrm{e}^x+1\right)^{\frac{3}{4}}}{3}+\frac{4\left(\mathrm{e}^x+1\right)^{\frac{7}{4}}}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(2*x)/(exp(x)+1)^(1/4),x)
```

```
[Out] -4/3*(exp(x)+1)^(3/4)+4/7*(exp(x)+1)^(7/4)
```

maxima [A] time = 0.98, size = 17, normalized size = 0.63

$$\frac{4}{7}\left(e^{x}+1\right)^{\frac{7}{4}}-\frac{4}{3}\left(e^{x}+1\right)^{\frac{3}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(1+exp(x))^(1/4),x, algorithm="maxima")
```

```
[Out] 4/7*(e^x + 1)^(7/4) - 4/3*(e^x + 1)^(3/4)
```

mupad [B] time = 3.54, size = 14, normalized size = 0.52

$$\frac{4\left(\mathrm{e}^{x}+1\right)^{3/4}\left(3\,\mathrm{e}^{x}-4\right)}{21}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(2*x)/(exp(x) + 1)^(1/4),x)
```

```
[Out] (4*(exp(x) + 1)^(3/4)*(3*exp(x) - 4))/21
```

sympy [A] time = 2.25, size = 22, normalized size = 0.81

$$\frac{4\left(e^{x}+1\right)^{\frac{7}{4}}}{7}-\frac{4\left(e^{x}+1\right)^{\frac{3}{4}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(2*x)/(1+exp(x))**(1/4),x)
```

```
[Out] 4*(exp(x) + 1)**(7/4)/7 - 4*(exp(x) + 1)**(3/4)/3
```

3.689 $\int \frac{-e^x+2e^{2x}}{\sqrt{-1-6e^x+3e^{2x}}}\,dx$

Optimal. Leaf size=62

$$\frac{2}{3}\sqrt{-6e^x+3e^{2x}-1}-\frac{\tanh^{-1}\left(\frac{\sqrt{3}(1-e^x)}{\sqrt{-6e^x+3e^{2x}-1}}\right)}{\sqrt{3}}$$

```
[Out] -1/3*arctanh((1-exp(x))*3^(1/2)/(-1-6*exp(x)+3*exp(2*x))^(1/2))*3^(1/2)+2/3
*(-1-6*exp(x)+3*exp(2*x))^(1/2)
```

Rubi [A] time = 0.05, antiderivative size = 62, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {2282, 640, 621, 206}

$$\frac{2}{3}\sqrt{-6e^x+3e^{2x}-1}-\frac{\tanh^{-1}\left(\frac{\sqrt{3}(1-e^x)}{\sqrt{-6e^x+3e^{2x}-1}}\right)}{\sqrt{3}}$$

Antiderivative was successfully verified.

```
[In] Int[(-E^x + 2*E^(2*x))/Sqrt[-1 - 6*E^x + 3*E^(2*x)],x]
```

```
[Out] (2*Sqrt[-1 - 6*E^x + 3*E^(2*x)])/3 - ArcTanh[(Sqrt[3]*(1 - E^x))/Sqrt[-1 -
6*E^x + 3*E^(2*x)]]/Sqrt[3]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 621

```
Int[1/Sqrt[(a_) + (b_.)*(x_) + (c_.)*(x_)^2], x_Symbol] :> Dist[2, Subst[In
t[1/(4*c - x^2), x], x, (b + 2*c*x)/Sqrt[a + b*x + c*x^2]], x] /; FreeQ[{a,
 b, c}, x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 640

```
Int[((d_.) + (e_.)*(x_))*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_), x_Symbol
] :> Simp[(e*(a + b*x + c*x^2)^(p + 1))/(2*c*(p + 1)), x] + Dist[(2*c*d - b
*e)/(2*c), Int[(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, p}, x]
&& NeQ[2*c*d - b*e, 0] && NeQ[p, -1]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}\int \frac{-e^x+2e^{2x}}{\sqrt{-1-6e^x+3e^{2x}}}\,dx &= \text{Subst}\left(\int \frac{-1+2x}{\sqrt{-1-6x+3x^2}}\,dx, x, e^x\right)\\ &= \frac{2}{3}\sqrt{-1-6e^x+3e^{2x}}+\text{Subst}\left(\int \frac{1}{\sqrt{-1-6x+3x^2}}\,dx, x, e^x\right)\\ &= \frac{2}{3}\sqrt{-1-6e^x+3e^{2x}}+2\,\text{Subst}\left(\int \frac{1}{12-x^2}\,dx, x, \frac{-6+6e^x}{\sqrt{-1-6e^x+3e^{2x}}}\right)\\ &= \frac{2}{3}\sqrt{-1-6e^x+3e^{2x}}-\frac{\tanh^{-1}\left(\frac{\sqrt{3}(1-e^x)}{\sqrt{-1-6e^x+3e^{2x}}}\right)}{\sqrt{3}}\end{aligned}$$

Mathematica [A] time = 0.04, size = 54, normalized size = 0.87

$$\frac{2}{3}\sqrt{-6e^x+3e^{2x}-1}+\frac{\tanh^{-1}\left(\frac{e^x-1}{\sqrt{-2e^x+e^{2x}-\frac{1}{3}}}\right)}{\sqrt{3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(-E^x + 2*E^(2*x))/Sqrt[-1 - 6*E^x + 3*E^(2*x)],x]
```

```
[Out] (2*Sqrt[-1 - 6*E^x + 3*E^(2*x)])/3 + ArcTanh[(-1 + E^x)/Sqrt[-1/3 - 2*E^x +
 E^(2*x)]]/Sqrt[3]
```

fricas [A] time = 0.40, size = 62, normalized size = 1.00

$$\frac{1}{6}\sqrt{3}\log\left(\left(\sqrt{3}e^x-\sqrt{3}\right)\sqrt{3e^{(2x)}-6e^x-1}+3e^{(2x)}-6e^x+1\right)+\frac{2}{3}\sqrt{3e^{(2x)}-6e^x-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-exp(x)+2*exp(2*x))/(-1-6*exp(x)+3*exp(2*x))^(1/2),x, algorithm=
"fricas")
```

```
[Out] 1/6*sqrt(3)*log((sqrt(3)*e^x - sqrt(3))*sqrt(3*e^(2*x) - 6*e^x - 1) + 3*e^(
2*x) - 6*e^x + 1) + 2/3*sqrt(3*e^(2*x) - 6*e^x - 1)
```

giac [A] time = 0.25, size = 49, normalized size = 0.79

$$-\frac{1}{3}\sqrt{3}\log\left(\left|-\sqrt{3}e^{x}+\sqrt{3}+\sqrt{3e^{(2x)}-6e^{x}-1}\right|\right)+\frac{2}{3}\sqrt{3e^{(2x)}-6e^{x}-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-exp(x)+2*exp(2*x))/(-1-6*exp(x)+3*exp(2*x))^(1/2),x, algorithm=
"giac")
```

```
[Out] -1/3*sqrt(3)*log(abs(-sqrt(3)*e^x + sqrt(3) + sqrt(3*e^(2*x) - 6*e^x - 1)))
 + 2/3*sqrt(3*e^(2*x) - 6*e^x - 1)
```

maple [A] time = 0.05, size = 50, normalized size = 0.81

$$\frac{\sqrt{3}\ \ln\left(\frac{(3\,e^{x}-3)\sqrt{3}}{3}+\sqrt{-6\,e^{x}+3\,e^{2x}-1}\right)}{3}+\frac{2\sqrt{-6\,e^{x}+3\,e^{2x}-1}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-exp(x)+2*exp(2*x))/(-1-6*exp(x)+3*exp(2*x))^(1/2),x)
```

```
[Out] 1/3*ln(1/3*(-3+3*exp(x))*3^(1/2)+(-1-6*exp(x)+3*exp(x)^2)^(1/2))*3^(1/2)+2/
3*(-1-6*exp(x)+3*exp(x)^2)^(1/2)
```

maxima [A] time = 1.97, size = 48, normalized size = 0.77

$$\frac{1}{3}\sqrt{3}\log\left(2\sqrt{3}\sqrt{3e^{(2x)}-6e^{x}-1}+6e^{x}-6\right)+\frac{2}{3}\sqrt{3e^{(2x)}-6e^{x}-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-exp(x)+2*exp(2*x))/(-1-6*exp(x)+3*exp(2*x))^(1/2),x, algorithm=
"maxima")
```

```
[Out] 1/3*sqrt(3)*log(2*sqrt(3)*sqrt(3*e^(2*x) - 6*e^x - 1) + 6*e^x - 6) + 2/3*sq
rt(3*e^(2*x) - 6*e^x - 1)
```

mupad [B] time = 4.20, size = 49, normalized size = 0.79

$$\frac{\sqrt{3}\ \ln\left(\sqrt{3\,e^{2x}-6\,e^{x}-1}-\sqrt{3}+\sqrt{3}\ e^{x}\right)}{3}+\frac{2\sqrt{3\,e^{2x}-6\,e^{x}-1}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((2*exp(2*x) - exp(x))/(3*exp(2*x) - 6*exp(x) - 1)^(1/2),x)
```

```
[Out] (3^(1/2)*log((3*exp(2*x) - 6*exp(x) - 1)^(1/2) - 3^(1/2) + 3^(1/2)*exp(x)))
/3 + (2*(3*exp(2*x) - 6*exp(x) - 1)^(1/2))/3
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(2e^x - 1)\,e^x}{\sqrt{3e^{2x} - 6e^x - 1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-exp(x)+2*exp(2*x))/(-1-6*exp(x)+3*exp(2*x))**(1/2),x)
```

```
[Out] Integral((2*exp(x) - 1)*exp(x)/sqrt(3*exp(2*x) - 6*exp(x) - 1), x)
```

3.690 $\int e^x \left(-5x + x^2\right) dx$

Optimal. Leaf size=19

$$e^x x^2 - 7e^x x + 7e^x$$

```
[Out] 7*exp(x)-7*exp(x)*x+exp(x)*x^2
```

Rubi [A] time = 0.04, antiderivative size = 19, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 4, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.364, Rules used = {1593, 2196, 2176, 2194}

$$e^x x^2 - 7e^x x + 7e^x$$

Antiderivative was successfully verified.

```
[In] Int[E^x*(-5*x + x^2),x]
```

```
[Out] 7*E^x - 7*E^x*x + E^x*x^2
```

Rule 1593

```
Int[(u_.)*((a_.)*(x_)^(p_.) + (b_.)*(x_)^(q_.))^(n_.), x_Symbol] :> Int[u*x
^(n*p)*(a + b*x^(q - p))^n, x] /; FreeQ[{a, b, p, q}, x] && IntegerQ[n] &&
PosQ[q - p]
```

Rule 2176

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_.), x_Symbol] :> Simp[((c + d*x)^m*(b*F^(g*(e + f*x)))^n)/(f*g*n*Log[F]),
x] - Dist[(d*m)/(f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*(b*F^(g*(e + f*x)))^n
, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && GtQ[m, 0] && IntegerQ[2*m
] &&  !$UseGamma === True
```

Rule 2194

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 2196

```
Int[(F_)^((c_.)*(v_))*(u_), x_Symbol] :> Int[ExpandIntegrand[F^(c*ExpandToS
um[v, x]), u, x], x] /; FreeQ[{F, c}, x] && PolynomialQ[u, x] && LinearQ[v,
 x] &&  !$UseGamma === True
```

Rubi steps

$$\begin{aligned}
\int e^x\left(-5x+x^2\right)dx &= \int e^x(-5+x)x\,dx \\
&= \int\left(-5e^x x+e^x x^2\right)dx \\
&= -\left(5\int e^x x\,dx\right)+\int e^x x^2\,dx \\
&= -5e^x x+e^x x^2-2\int e^x x\,dx+5\int e^x\,dx \\
&= 5e^x-7e^x x+e^x x^2+2\int e^x\,dx \\
&= 7e^x-7e^x x+e^x x^2
\end{aligned}$$

Mathematica [A] time = 0.03, size = 12, normalized size = 0.63

$$e^x\left(x^2-7x+7\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x*(-5*x + x^2),x]
[Out] E^x*(7 - 7*x + x^2)
```

fricas [A] time = 0.38, size = 11, normalized size = 0.58

$$\left(x^2-7\,x+7\right)e^x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(x^2-5*x),x, algorithm="fricas")
[Out] (x^2 - 7*x + 7)*e^x
```

giac [A] time = 0.19, size = 11, normalized size = 0.58

$$\left(x^2-7\,x+7\right)e^x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(x^2-5*x),x, algorithm="giac")
[Out] (x^2 - 7*x + 7)*e^x
```

maple [A] time = 0.02, size = 12, normalized size = 0.63

$$\left(x^2-7x+7\right)\mathrm{e}^x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*(x^2-5*x),x)
```

```
[Out] exp(x)*(x^2-7*x+7)
```

maxima [A] time = 0.97, size = 19, normalized size = 1.00

$$\left(x^2 - 2\,x + 2\right)e^x - 5\,(x - 1)e^x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(x^2-5*x),x, algorithm="maxima")
```

```
[Out] (x^2 - 2*x + 2)*e^x - 5*(x - 1)*e^x
```

mupad [B] time = 3.46, size = 11, normalized size = 0.58

$$\mathrm{e}^x\,\left(x^2 - 7\,x + 7\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-exp(x)*(5*x - x^2),x)
```

```
[Out] exp(x)*(x^2 - 7*x + 7)
```

sympy [A] time = 0.09, size = 10, normalized size = 0.53

$$\left(x^2 - 7x + 7\right)e^x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(x**2-5*x),x)
```

```
[Out] (x**2 - 7*x + 7)*exp(x)
```

3.691 $\int e^{3x}\left(-x+x^2\right)\,dx$

Optimal. Leaf size=32

$$\frac{1}{3}e^{3x}x^2-\frac{5}{9}e^{3x}x+\frac{5e^{3x}}{27}$$

```
[Out] 5/27*exp(3*x)-5/9*exp(3*x)*x+1/3*exp(3*x)*x^2
```

Rubi [A] time = 0.05, antiderivative size = 32, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308, Rules used = {1593, 2196, 2176, 2194}

$$\frac{1}{3}e^{3x}x^2-\frac{5}{9}e^{3x}x+\frac{5e^{3x}}{27}$$

Antiderivative was successfully verified.

```
[In] Int[E^(3*x)*(-x + x^2),x]
```

```
[Out] (5*E^(3*x))/27 - (5*E^(3*x)*x)/9 + (E^(3*x)*x^2)/3
```

Rule 1593

```
Int[(u_.)*((a_.)*(x_)^(p_.) + (b_.)*(x_)^(q_.))^(n_.), x_Symbol] :> Int[u*x
^(n*p)*(a + b*x^(q - p))^n, x] /; FreeQ[{a, b, p, q}, x] && IntegerQ[n] &&
PosQ[q - p]
```

Rule 2176

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_.), x_Symbol] :> Simp[((c + d*x)^m*(b*F^(g*(e + f*x)))^n)/(f*g*n*Log[F]),
x] - Dist[(d*m)/(f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*(b*F^(g*(e + f*x)))^n
, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && GtQ[m, 0] && IntegerQ[2*m
] &&  !$UseGamma === True
```

Rule 2194

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 2196

```
Int[(F_)^((c_.)*(v_))*(u_), x_Symbol] :> Int[ExpandIntegrand[F^(c*ExpandToS
um[v, x]), u, x], x] /; FreeQ[{F, c}, x] && PolynomialQ[u, x] && LinearQ[v,
 x] &&  !$UseGamma === True
```

Rubi steps

$$\begin{aligned}\int e^{3x}\left(-x+x^2\right)dx &= \int e^{3x}(-1+x)x\,dx\\ &= \int\left(-e^{3x}x+e^{3x}x^2\right)dx\\ &= -\int e^{3x}x\,dx+\int e^{3x}x^2\,dx\\ &= -\frac{1}{3}e^{3x}x+\frac{1}{3}e^{3x}x^2+\frac{1}{3}\int e^{3x}\,dx-\frac{2}{3}\int e^{3x}x\,dx\\ &= \frac{e^{3x}}{9}-\frac{5}{9}e^{3x}x+\frac{1}{3}e^{3x}x^2+\frac{2}{9}\int e^{3x}\,dx\\ &= \frac{5e^{3x}}{27}-\frac{5}{9}e^{3x}x+\frac{1}{3}e^{3x}x^2\end{aligned}$$

Mathematica [A] time = 0.03, size = 19, normalized size = 0.59

$$\frac{1}{27}e^{3x}\left(9x^2-15x+5\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(3*x)*(-x + x^2),x]
[Out] (E^(3*x)*(5 - 15*x + 9*x^2))/27
```

fricas [A] time = 0.38, size = 16, normalized size = 0.50

$$\frac{1}{27}\left(9\,x^2-15\,x+5\right)e^{(3\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(3*x)*(x^2-x),x, algorithm="fricas")
[Out] 1/27*(9*x^2 - 15*x + 5)*e^(3*x)
```

giac [A] time = 0.21, size = 16, normalized size = 0.50

$$\frac{1}{27}\left(9\,x^2-15\,x+5\right)e^{(3\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(3*x)*(x^2-x),x, algorithm="giac")
```

```
[Out] 1/27*(9*x^2 - 15*x + 5)*e^(3*x)
```

maple [A] time = 0.02, size = 17, normalized size = 0.53

$$\frac{\left(9x^2-15x+5\right)\mathrm{e}^{3x}}{27}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(3*x)*(x^2-x),x)
```

```
[Out] 1/27*exp(3*x)*(9*x^2-15*x+5)
```

maxima [A] time = 0.95, size = 28, normalized size = 0.88

$$\frac{1}{27}\left(9\,x^2-6\,x+2\right)e^{(3\,x)}-\frac{1}{9}\,(3\,x-1)e^{(3\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(3*x)*(x^2-x),x, algorithm="maxima")
```

```
[Out] 1/27*(9*x^2 - 6*x + 2)*e^(3*x) - 1/9*(3*x - 1)*e^(3*x)
```

mupad [B] time = 3.53, size = 16, normalized size = 0.50

$$\frac{\mathrm{e}^{3\,x}\,\left(9\,x^2-15\,x+5\right)}{27}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-exp(3*x)*(x - x^2),x)
```

```
[Out] (exp(3*x)*(9*x^2 - 15*x + 5))/27
```

sympy [A] time = 0.09, size = 15, normalized size = 0.47

$$\frac{\left(9x^2-15x+5\right)e^{3x}}{27}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(3*x)*(x**2-x),x)
```

```
[Out] (9*x**2 - 15*x + 5)*exp(3*x)/27
```

3.692 $\int e^{x^x} x^{2x}(1+\log(x))\,dx$

Optimal. Leaf size=11

$$e^{x^x}\left(x^x-1\right)$$

```
[Out] exp(x^x)*(-1+x^x)
```

Rubi [F] time = 0.15, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int e^{x^x} x^{2x}(1+\log(x))\,dx$$

Verification is Not applicable to the result.

```
[In] Int[E^x^x*x^(2*x)*(1 + Log[x]),x]
```

```
[Out] Defer[Int][E^x^x*x^(2*x), x] + Log[x]*Defer[Int][E^x^x*x^(2*x), x] - Defer[
Int][Defer[Int][E^x^x*x^(2*x), x]/x, x]
```

Rubi steps

$$\begin{aligned}
\int e^{x^x} x^{2x}(1+\log(x))\,dx &= \int \left(e^{x^x} x^{2x}+e^{x^x} x^{2x}\log(x)\right)dx\\
&= \int e^{x^x} x^{2x}\,dx+\int e^{x^x} x^{2x}\log(x)\,dx\\
&= \log(x)\int e^{x^x} x^{2x}\,dx+\int e^{x^x} x^{2x}\,dx-\int \frac{\int e^{x^x} x^{2x}\,dx}{x}\,dx
\end{aligned}$$

Mathematica [A] time = 0.04, size = 11, normalized size = 1.00

$$e^{x^x}\left(x^x-1\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x^x*x^(2*x)*(1 + Log[x]),x]
```

```
[Out] E^x^x*(-1 + x^x)
```

fricas [A] time = 0.39, size = 10, normalized size = 0.91

$$\left(x^x-1\right)e^{\left(x^x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^x)*x^(2*x)*(1+log(x)),x, algorithm="fricas")
[Out] (x^x - 1)*e^(x^x)
```

giac [A] time = 0.19, size = 10, normalized size = 0.91

$$(x^x - 1)e^{(x^x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^x)*x^(2*x)*(1+log(x)),x, algorithm="giac")
[Out] (x^x - 1)*e^(x^x)
```

maple [B] time = 0.05, size = 22, normalized size = 2.00

$$e^{x \ln(x)} e^{e^{x \ln(x)}} - e^{e^{x \ln(x)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x^x)*x^(2*x)*(1+ln(x)),x)
[Out] exp(ln(x)*x)*exp(exp(ln(x)*x))-exp(exp(ln(x)*x))
```

maxima [A] time = 1.30, size = 10, normalized size = 0.91

$$(x^x - 1)e^{(x^x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^x)*x^(2*x)*(1+log(x)),x, algorithm="maxima")
[Out] (x^x - 1)*e^(x^x)
```

mupad [B] time = 3.59, size = 10, normalized size = 0.91

$$e^{x^x} \left(x^x - 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^(2*x)*exp(x^x)*(log(x) + 1),x)
[Out] exp(x^x)*(x^x - 1)
```

sympy [A] time = 0.45, size = 8, normalized size = 0.73

$$\left(x^x - 1\right) e^{x^x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x**x)*x**(2*x)*(1+ln(x)),x)
[Out] (x**x - 1)*exp(x**x)
```

3.693 $\int \frac{e^{5x}+e^{7x}}{e^{-x}+e^x}\,dx$

Optimal. Leaf size=9

$$\frac{e^{6x}}{6}$$

```
[Out] 1/6*exp(6*x)
```

Rubi [A] time = 0.03, antiderivative size = 9, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087, Rules used = {2282, 30}

$$\frac{e^{6x}}{6}$$

Antiderivative was successfully verified.

```
[In] Int[(E^(5*x) + E^(7*x))/(E^(-x) + E^x),x]
```

```
[Out] E^(6*x)/6
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}\int \frac{e^{5x}+e^{7x}}{e^{-x}+e^x}\,dx &= \text{Subst}\left(\int x^5\,dx,x,e^x\right)\\ &= \frac{e^{6x}}{6}\end{aligned}$$

Mathematica [A] time = 0.00, size = 9, normalized size = 1.00

$$\frac{e^{6x}}{6}$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^(5*x) + E^(7*x))/(E^(-x) + E^x),x]
```

```
[Out] E^(6*x)/6
```

fricas [A] time = 0.38, size = 6, normalized size = 0.67

$$\frac{1}{6}\, e^{(6\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(5*x)+exp(7*x))/(exp(-x)+exp(x)),x, algorithm="fricas")
```

```
[Out] 1/6*e^(6*x)
```

giac [A] time = 0.23, size = 6, normalized size = 0.67

$$\frac{1}{6}\, e^{(6\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(5*x)+exp(7*x))/(exp(-x)+exp(x)),x, algorithm="giac")
```

```
[Out] 1/6*e^(6*x)
```

maple [A] time = 0.04, size = 7, normalized size = 0.78

$$\frac{e^{6x}}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(5*x)+exp(7*x))/(exp(-x)+exp(x)),x)
```

```
[Out] 1/6*exp(x)^6
```

maxima [A] time = 1.05, size = 6, normalized size = 0.67

$$\frac{1}{6}\, e^{(6\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(5*x)+exp(7*x))/(exp(-x)+exp(x)),x, algorithm="maxima")
```

```
[Out] 1/6*e^(6*x)
```

mupad [B] time = 0.04, size = 6, normalized size = 0.67

$$\frac{\mathrm{e}^{6\,x}}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(5*x) + exp(7*x))/(exp(-x) + exp(x)),x)
```

```
[Out] exp(6*x)/6
```

sympy [A] time = 0.11, size = 5, normalized size = 0.56

$$\frac{e^{6x}}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(5*x)+exp(7*x))/(exp(-x)+exp(x)),x)
```

```
[Out] exp(6*x)/6
```

3.694 $\int x^{-2-\frac{1}{x}}(1-\log(x))\,dx$

Optimal. Leaf size=9

$$-x^{-1/x}$$

[Out] -1/(x^(1/x))

Rubi [F] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^{-2-\frac{1}{x}}(1-\log(x))\,dx$$

Verification is Not applicable to the result.

[In] Int[x^(-2 - x^(-1))*(1 - Log[x]),x]

[Out] Defer[Int][x^(-2 - x^(-1)), x] - Log[x]*Defer[Int][x^(-2 - x^(-1)), x] + Defer[Int][Defer[Int][x^(-2 - x^(-1)), x]/x, x]

Rubi steps

$$\begin{aligned}\int x^{-2-\frac{1}{x}}(1-\log(x))\,dx &= \int \left(x^{-2-\frac{1}{x}}-x^{-2-\frac{1}{x}}\log(x)\right)dx\\ &= \int x^{-2-\frac{1}{x}}\,dx-\int x^{-2-\frac{1}{x}}\log(x)\,dx\\ &= -\left(\log(x)\int x^{-2-\frac{1}{x}}\,dx\right)+\int x^{-2-\frac{1}{x}}\,dx+\int \frac{\int x^{-2-\frac{1}{x}}\,dx}{x}\,dx\end{aligned}$$

Mathematica [A] time = 0.02, size = 9, normalized size = 1.00

$$-x^{-1/x}$$

Antiderivative was successfully verified.

[In] Integrate[x^(-2 - x^(-1))*(1 - Log[x]),x]

[Out] -x^(-x^(-1))

fricas [A] time = 0.39, size = 18, normalized size = 2.00

$$-\frac{x^2}{x^{\frac{2x+1}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(-2-1/x)*(1-log(x)),x, algorithm="fricas")
```

```
[Out] -x^2/x^((2*x + 1)/x)
```

giac [A] time = 0.47, size = 16, normalized size = 1.78

$$-xe^{\left(-\frac{x\log(x)+\log(x)}{x}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(-2-1/x)*(1-log(x)),x, algorithm="giac")
```

```
[Out] -x*e^(-(x*log(x) + log(x))/x)
```

maple [A] time = 0.04, size = 18, normalized size = 2.00

$$-x^2x^{-\frac{2x+1}{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^(-2-1/x)*(1-ln(x)),x)
```

```
[Out] -x^2*x^(-(2*x+1)/x)
```

maxima [A] time = 1.38, size = 9, normalized size = 1.00

$$-\frac{1}{x^{\left(\frac{1}{x}\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(-2-1/x)*(1-log(x)),x, algorithm="maxima")
```

```
[Out] -1/x^(1/x)
```

mupad [B] time = 3.58, size = 9, normalized size = 1.00

$$-\frac{1}{x^{1/x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-(log(x) - 1)/x^(1/x + 2),x)
```

```
[Out] -1/x^(1/x)
```

sympy [A] time = 0.27, size = 12, normalized size = 1.33

$$-x^2x^{-2-\frac{1}{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**(-2-1/x)*(1-ln(x)),x)
```

```
[Out] -x**2*x**(-2 - 1/x)
```

3.695 $\int (a + be^x)^2 \, dx$

Optimal. Leaf size=25

$$a^2x + 2abe^x + \frac{1}{2}b^2e^{2x}$$

```
[Out] 2*a*b*exp(x)+1/2*b^2*exp(2*x)+a^2*x
```

Rubi [A] time = 0.01, antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {2282, 43}

$$a^2x + 2abe^x + \frac{1}{2}b^2e^{2x}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*E^x)^2,x]
```

```
[Out] 2*a*b*E^x + (b^2*E^(2*x))/2 + a^2*x
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}
\int (a + be^x)^2 \, dx &= \text{Subst}\left(\int \frac{(a + bx)^2}{x} \, dx, x, e^x\right) \\
&= \text{Subst}\left(\int \left(2ab + \frac{a^2}{x} + b^2x\right) dx, x, e^x\right) \\
&= 2abe^x + \frac{1}{2}b^2e^{2x} + a^2x
\end{aligned}$$

Mathematica [A] time = 0.01, size = 25, normalized size = 1.00

$$a^2x + 2abe^x + \frac{1}{2}b^2e^{2x}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*E^x)^2,x]
[Out] 2*a*b*E^x + (b^2*E^(2*x))/2 + a^2*x
```

fricas [A] time = 0.38, size = 21, normalized size = 0.84

$$a^2x + \frac{1}{2}b^2e^{(2x)} + 2abe^x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(x))^2,x, algorithm="fricas")
[Out] a^2*x + 1/2*b^2*e^(2*x) + 2*a*b*e^x
```

giac [A] time = 0.19, size = 21, normalized size = 0.84

$$a^2x + \frac{1}{2}b^2e^{(2x)} + 2abe^x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(x))^2,x, algorithm="giac")
[Out] a^2*x + 1/2*b^2*e^(2*x) + 2*a*b*e^x
```

maple [A] time = 0.03, size = 24, normalized size = 0.96

$$a^2\ln(e^x) + 2ab\,e^x + \frac{b^2e^{2x}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*exp(x)+a)^2,x)
[Out] 1/2*b^2*exp(x)^2+2*a*b*exp(x)+a^2*ln(exp(x))
```

maxima [A] time = 1.00, size = 21, normalized size = 0.84

$$a^2x + \frac{1}{2}b^2e^{(2x)} + 2abe^x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(x))^2,x, algorithm="maxima")
[Out] a^2*x + 1/2*b^2*e^(2*x) + 2*a*b*e^x
```

mupad [B] time = 3.55, size = 21, normalized size = 0.84

$$x\,a^2 + 2\,\mathrm{e}^x\,a\,b + \frac{\mathrm{e}^{2\,x}\,b^2}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*exp(x))^2,x)
[Out] (b^2*exp(2*x))/2 + a^2*x + 2*a*b*exp(x)
```

sympy [A] time = 0.11, size = 22, normalized size = 0.88

$$a^2x + 2abe^x + \frac{b^2e^{2x}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(x))**2,x)
[Out] a**2*x + 2*a*b*exp(x) + b**2*exp(2*x)/2
```

3.696 $\int (a+be^x)^3\,dx$

Optimal. Leaf size=40

$$a^3x+3a^2be^x+\frac{3}{2}ab^2e^{2x}+\frac{1}{3}b^3e^{3x}$$

```
[Out] 3*a^2*b*exp(x)+3/2*a*b^2*exp(2*x)+1/3*b^3*exp(3*x)+a^3*x
```

Rubi [A] time = 0.02, antiderivative size = 40, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {2282, 43}

$$3a^2be^x+a^3x+\frac{3}{2}ab^2e^{2x}+\frac{1}{3}b^3e^{3x}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*E^x)^3,x]
```

```
[Out] 3*a^2*b*E^x + (3*a*b^2*E^(2*x))/2 + (b^3*E^(3*x))/3 + a^3*x
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}\int (a+be^x)^3\,dx &= \text{Subst}\left(\int \frac{(a+bx)^3}{x}\,dx, x, e^x\right)\\ &= \text{Subst}\left(\int \left(3a^2b+\frac{a^3}{x}+3ab^2x+b^3x^2\right)dx, x, e^x\right)\\ &= 3a^2be^x+\frac{3}{2}ab^2e^{2x}+\frac{1}{3}b^3e^{3x}+a^3x\end{aligned}$$

Mathematica [A] time = 0.01, size = 40, normalized size = 1.00

$$a^3x+3a^2be^x+\frac{3}{2}ab^2e^{2x}+\frac{1}{3}b^3e^{3x}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*E^x)^3,x]
[Out] 3*a^2*b*E^x + (3*a*b^2*E^(2*x))/2 + (b^3*E^(3*x))/3 + a^3*x
```

fricas [A] time = 0.40, size = 33, normalized size = 0.82

$$a^3x+\frac{1}{3}\,b^3e^{(3\,x)}+\frac{3}{2}\,ab^2e^{(2\,x)}+3\,a^2be^x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(x))^3,x, algorithm="fricas")
[Out] a^3*x + 1/3*b^3*e^(3*x) + 3/2*a*b^2*e^(2*x) + 3*a^2*b*e^x
```

giac [A] time = 0.21, size = 33, normalized size = 0.82

$$a^3x+\frac{1}{3}\,b^3e^{(3\,x)}+\frac{3}{2}\,ab^2e^{(2\,x)}+3\,a^2be^x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(x))^3,x, algorithm="giac")
[Out] a^3*x + 1/3*b^3*e^(3*x) + 3/2*a*b^2*e^(2*x) + 3*a^2*b*e^x
```

maple [A] time = 0.02, size = 36, normalized size = 0.90

$$a^3\ln\left(\mathrm{e}^x\right)+3a^2b\,\mathrm{e}^x+\frac{3a\,b^2\mathrm{e}^{2x}}{2}+\frac{b^3\mathrm{e}^{3x}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*exp(x)+a)^3,x)
[Out] 1/3*exp(x)^3*b^3+3/2*exp(x)^2*a*b^2+3*a^2*b*exp(x)+a^3*ln(exp(x))
```

maxima [A] time = 0.99, size = 33, normalized size = 0.82

$$a^3x+\frac{1}{3}\,b^3e^{(3\,x)}+\frac{3}{2}\,ab^2e^{(2\,x)}+3\,a^2be^x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(x))^3,x, algorithm="maxima")
[Out] a^3*x + 1/3*b^3*e^(3*x) + 3/2*a*b^2*e^(2*x) + 3*a^2*b*e^x
```

mupad [B] time = 0.07, size = 33, normalized size = 0.82

$$x\,a^3+3\,\mathrm{e}^x\,a^2\,b+\frac{3\,\mathrm{e}^{2\,x}\,a\,b^2}{2}+\frac{\mathrm{e}^{3\,x}\,b^3}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*exp(x))^3,x)
[Out] (b^3*exp(3*x))/3 + a^3*x + 3*a^2*b*exp(x) + (3*a*b^2*exp(2*x))/2
```

sympy [A] time = 0.14, size = 37, normalized size = 0.92

$$a^3x+3a^2be^x+\frac{3ab^2e^{2x}}{2}+\frac{b^3e^{3x}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(x))**3,x)
[Out] a**3*x + 3*a**2*b*exp(x) + 3*a*b**2*exp(2*x)/2 + b**3*exp(3*x)/3
```

3.697 $\int (a + be^x)^4 \, dx$

Optimal. Leaf size=53

$$a^4x + 4a^3be^x + 3a^2b^2e^{2x} + \frac{4}{3}ab^3e^{3x} + \frac{1}{4}b^4e^{4x}$$

```
[Out] 4*a^3*b*exp(x)+3*a^2*b^2*exp(2*x)+4/3*a*b^3*exp(3*x)+1/4*b^4*exp(4*x)+a^4*x
```

Rubi [A] time = 0.03, antiderivative size = 53, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {2282, 43}

$$3a^2b^2e^{2x} + 4a^3be^x + a^4x + \frac{4}{3}ab^3e^{3x} + \frac{1}{4}b^4e^{4x}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*E^x)^4,x]
```

```
[Out] 4*a^3*b*E^x + 3*a^2*b^2*E^(2*x) + (4*a*b^3*E^(3*x))/3 + (b^4*E^(4*x))/4 + a
^4*x
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\int (a+be^x)^4\,dx = \text{Subst}\left(\int \frac{(a+bx)^4}{x}\,dx,x,e^x\right)$$
$$= \text{Subst}\left(\int \left(4a^3b+\frac{a^4}{x}+6a^2b^2x+4ab^3x^2+b^4x^3\right)dx,x,e^x\right)$$
$$= 4a^3be^x+3a^2b^2e^{2x}+\frac{4}{3}ab^3e^{3x}+\frac{1}{4}b^4e^{4x}+a^4x$$

Mathematica [A] time = 0.02, size = 53, normalized size = 1.00

$$a^4x+4a^3be^x+3a^2b^2e^{2x}+\frac{4}{3}ab^3e^{3x}+\frac{1}{4}b^4e^{4x}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*E^x)^4,x]
[Out] 4*a^3*b*E^x + 3*a^2*b^2*E^(2*x) + (4*a*b^3*E^(3*x))/3 + (b^4*E^(4*x))/4 + a
^4*x
```

fricas [A] time = 0.38, size = 45, normalized size = 0.85

$$a^4x+\frac{1}{4}\,b^4e^{(4\,x)}+\frac{4}{3}\,ab^3e^{(3\,x)}+3\,a^2b^2e^{(2\,x)}+4\,a^3be^x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(x))^4,x, algorithm="fricas")
[Out] a^4*x + 1/4*b^4*e^(4*x) + 4/3*a*b^3*e^(3*x) + 3*a^2*b^2*e^(2*x) + 4*a^3*b*e
^x
```

giac [A] time = 0.21, size = 45, normalized size = 0.85

$$a^4x+\frac{1}{4}\,b^4e^{(4\,x)}+\frac{4}{3}\,ab^3e^{(3\,x)}+3\,a^2b^2e^{(2\,x)}+4\,a^3be^x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(x))^4,x, algorithm="giac")
[Out] a^4*x + 1/4*b^4*e^(4*x) + 4/3*a*b^3*e^(3*x) + 3*a^2*b^2*e^(2*x) + 4*a^3*b*e
^x
```

maple [A] time = 0.02, size = 48, normalized size = 0.91

$$a^{4} \ln \left(\mathrm{e}^{x}\right)+4 a^{3} b \,\mathrm{e}^{x}+3 a^{2} b^{2} \mathrm{e}^{2 x}+\frac{4 a \,b^{3} \mathrm{e}^{3 x}}{3}+\frac{b^{4} \mathrm{e}^{4 x}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*exp(x)+a)^4,x)
```

```
[Out] 1/4*b^4*exp(x)^4+4/3*a*b^3*exp(x)^3+3*a^2*b^2*exp(x)^2+4*a^3*b*exp(x)+a^4*l
n(exp(x))
```

maxima [A] time = 0.93, size = 45, normalized size = 0.85

$$a^{4}x+\frac{1}{4}\,b^{4}e^{(4\,x)}+\frac{4}{3}\,ab^{3}e^{(3\,x)}+3\,a^{2}b^{2}e^{(2\,x)}+4\,a^{3}be^{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(x))^4,x, algorithm="maxima")
```

```
[Out] a^4*x + 1/4*b^4*e^(4*x) + 4/3*a*b^3*e^(3*x) + 3*a^2*b^2*e^(2*x) + 4*a^3*b*e
^x
```

mupad [B] time = 3.43, size = 45, normalized size = 0.85

$$x\,a^4+4\,{\mathrm{e}}^x\,a^3\,b+3\,{\mathrm{e}}^{2\,x}\,a^2\,b^2+\frac{4\,{\mathrm{e}}^{3\,x}\,a\,b^3}{3}+\frac{{\mathrm{e}}^{4\,x}\,b^4}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*exp(x))^4,x)
```

```
[Out] (b^4*exp(4*x))/4 + a^4*x + 3*a^2*b^2*exp(2*x) + 4*a^3*b*exp(x) + (4*a*b^3*e
xp(3*x))/3
```

sympy [A] time = 0.15, size = 51, normalized size = 0.96

$$a^{4} x + 4 a^{3} b e^{x} + 3 a^{2} b^{2} e^{2 x} + \frac{4 a b^{3} e^{3 x}}{3} + \frac{b^{4} e^{4 x}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(x))**4,x)
```

```
[Out] a**4*x + 4*a**3*b*exp(x) + 3*a**2*b**2*exp(2*x) + 4*a*b**3*exp(3*x)/3 + b**
4*exp(4*x)/4
```

3.698 $\int \frac{1}{\sqrt{a+be^{c+dx}}}\,dx$

Optimal. Leaf size=32

$$-\frac{2\tanh^{-1}\left(\frac{\sqrt{a+be^{c+dx}}}{\sqrt{a}}\right)}{\sqrt{a}\,d}$$

[Out] -2*arctanh((a+b*exp(d*x+c))^(1/2)/a^(1/2))/d/a^(1/2)

Rubi [A] time = 0.03, antiderivative size = 32, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2282, 63, 208}

$$-\frac{2\tanh^{-1}\left(\frac{\sqrt{a+be^{c+dx}}}{\sqrt{a}}\right)}{\sqrt{a}\,d}$$

Antiderivative was successfully verified.

[In] Int[1/Sqrt[a + b*E^(c + d*x)],x]

[Out] (-2*ArcTanh[Sqrt[a + b*E^(c + d*x)]/Sqrt[a]])/(Sqrt[a]*d)

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\int \frac{1}{\sqrt{a+be^{c+dx}}}\,dx = \frac{\text{Subst}\left(\int \frac{1}{x\sqrt{a+bx}}\,dx, x, e^{c+dx}\right)}{d}$$
$$= \frac{2\,\text{Subst}\left(\int \frac{1}{-\frac{a}{b}+\frac{x^2}{b}}\,dx, x, \sqrt{a+be^{c+dx}}\right)}{bd}$$
$$= -\frac{2\tanh^{-1}\left(\frac{\sqrt{a+be^{c+dx}}}{\sqrt{a}}\right)}{\sqrt{a}\,d}$$

Mathematica [A] time = 0.01, size = 32, normalized size = 1.00

$$-\frac{2\tanh^{-1}\left(\frac{\sqrt{a+be^{c+dx}}}{\sqrt{a}}\right)}{\sqrt{a}\,d}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/Sqrt[a + b*E^(c + d*x)],x]
```

```
[Out] (-2*ArcTanh[Sqrt[a + b*E^(c + d*x)]/Sqrt[a]])/(Sqrt[a]*d)
```

fricas [A] time = 0.40, size = 83, normalized size = 2.59

$$\left[\frac{\log\left(\left(be^{(dx+c)} - 2\sqrt{be^{(dx+c)}+a}\,\sqrt{a} + 2\,a\right)e^{(-dx-c)}\right)}{\sqrt{a}\,d}, \frac{2\sqrt{-a}\,\arctan\left(\frac{\sqrt{be^{(dx+c)}+a}\,\sqrt{-a}}{a}\right)}{ad}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*exp(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] [log((b*e^(d*x + c) - 2*sqrt(b*e^(d*x + c) + a)*sqrt(a) + 2*a)*e^(-d*x - c)
)/(sqrt(a)*d), 2*sqrt(-a)*arctan(sqrt(b*e^(d*x + c) + a)*sqrt(-a)/a)/(a*d)]
```

giac [A] time = 0.22, size = 29, normalized size = 0.91

$$\frac{2\,\arctan\left(\frac{\sqrt{be^{(dx+c)}+a}}{\sqrt{-a}}\right)}{\sqrt{-a}\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*exp(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] 2*arctan(sqrt(b*e^(d*x + c) + a)/sqrt(-a))/(sqrt(-a)*d)
```

maple [A] time = 0.04, size = 26, normalized size = 0.81

$$-\frac{2 \operatorname{arctanh}\left(\frac{\sqrt{b\,\mathrm{e}^{d x+c}+a}}{\sqrt{a}}\right)}{\sqrt{a}\ d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*exp(d*x+c)+a)^(1/2),x)
```

```
[Out] -2*arctanh((b*exp(d*x+c)+a)^(1/2)/a^(1/2))/d/a^(1/2)
```

maxima [A] time = 1.69, size = 45, normalized size = 1.41

$$\frac{\log\left(\frac{\sqrt{be^{(dx+c)}+a}-\sqrt{a}}{\sqrt{be^{(dx+c)}+a}+\sqrt{a}}\right)}{\sqrt{a}\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*exp(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] log((sqrt(b*e^(d*x + c) + a) - sqrt(a))/(sqrt(b*e^(d*x + c) + a) + sqrt(a))
)/(sqrt(a)*d)
```

mupad [B] time = 3.62, size = 25, normalized size = 0.78

$$-\frac{2 \operatorname{atanh}\left(\frac{\sqrt{a+b\,\mathrm{e}^{d\,x}\,\mathrm{e}^{c}}}{\sqrt{a}}\right)}{\sqrt{a}\ d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a + b*exp(c + d*x))^(1/2),x)
```

```
[Out] -(2*atanh((a + b*exp(d*x)*exp(c))^(1/2)/a^(1/2)))/(a^(1/2)*d)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{a + be^{c+dx}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*exp(d*x+c))**(1/2),x)
```

```
[Out] Integral(1/sqrt(a + b*exp(c + d*x)), x)
```

3.699 $\int \frac{1}{\sqrt{-a+be^{c+dx}}}\,dx$

Optimal. Leaf size=34

$$\frac{2\tan^{-1}\left(\frac{\sqrt{be^{c+dx}-a}}{\sqrt{a}}\right)}{\sqrt{a}\,d}$$

```
[Out] 2*arctan((-a+b*exp(d*x+c))^(1/2)/a^(1/2))/d/a^(1/2)
```

Rubi [A] time = 0.03, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.176, Rules used = {2282, 63, 205}

$$\frac{2\tan^{-1}\left(\frac{\sqrt{be^{c+dx}-a}}{\sqrt{a}}\right)}{\sqrt{a}\,d}$$

Antiderivative was successfully verified.

```
[In] Int[1/Sqrt[-a + b*E^(c + d*x)],x]
```

```
[Out] (2*ArcTan[Sqrt[-a + b*E^(c + d*x)]/Sqrt[a]])/(Sqrt[a]*d)
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\int \frac{1}{\sqrt{-a+be^{c+dx}}}\,dx = \frac{\text{Subst}\left(\int \frac{1}{x\sqrt{-a+bx}}\,dx, x, e^{c+dx}\right)}{d}$$
$$= \frac{2\,\text{Subst}\left(\int \frac{1}{\frac{a}{b}+\frac{x^2}{b}}\,dx, x, \sqrt{-a+be^{c+dx}}\right)}{bd}$$
$$= \frac{2\tan^{-1}\left(\frac{\sqrt{-a+be^{c+dx}}}{\sqrt{a}}\right)}{\sqrt{a}\,d}$$

Mathematica [A] time = 0.01, size = 34, normalized size = 1.00

$$\frac{2\tan^{-1}\left(\frac{\sqrt{be^{c+dx}-a}}{\sqrt{a}}\right)}{\sqrt{a}\,d}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/Sqrt[-a + b*E^(c + d*x)],x]
[Out] (2*ArcTan[Sqrt[-a + b*E^(c + d*x)]/Sqrt[a]])/(Sqrt[a]*d)
```

fricas [A] time = 0.40, size = 85, normalized size = 2.50

$$\left[-\frac{\sqrt{-a}\,\log\left(\left(be^{(dx+c)}-2\sqrt{be^{(dx+c)}-a}\,\sqrt{-a}-2\,a\right)e^{(-dx-c)}\right)}{ad}, \frac{2\,\arctan\left(\frac{\sqrt{be^{(dx+c)}-a}}{\sqrt{a}}\right)}{\sqrt{a}\,d}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a+b*exp(d*x+c))^(1/2),x, algorithm="fricas")
[Out] [-sqrt(-a)*log((b*e^(d*x + c) - 2*sqrt(b*e^(d*x + c) - a)*sqrt(-a) - 2*a)*e
^(-d*x - c))/(a*d), 2*arctan(sqrt(b*e^(d*x + c) - a)/sqrt(a))/(sqrt(a)*d)]
```

giac [A] time = 0.22, size = 27, normalized size = 0.79

$$\frac{2\,\arctan\left(\frac{\sqrt{be^{(dx+c)}-a}}{\sqrt{a}}\right)}{\sqrt{a}\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a+b*exp(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] 2*arctan(sqrt(b*e^(d*x + c) - a)/sqrt(a))/(sqrt(a)*d)
```

maple [A] time = 0.04, size = 28, normalized size = 0.82

$$\frac{2\arctan\left(\frac{\sqrt{b\,\mathrm{e}^{dx+c}-a}}{\sqrt{a}}\right)}{\sqrt{a}\;d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-a+b*exp(d*x+c))^(1/2),x)
```

```
[Out] 2*arctan((-a+b*exp(d*x+c))^(1/2)/a^(1/2))/d/a^(1/2)
```

maxima [A] time = 2.03, size = 27, normalized size = 0.79

$$\frac{2\,\arctan\left(\frac{\sqrt{be^{(dx+c)}-a}}{\sqrt{a}}\right)}{\sqrt{a}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a+b*exp(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] 2*arctan(sqrt(b*e^(d*x + c) - a)/sqrt(a))/(sqrt(a)*d)
```

mupad [B] time = 3.62, size = 31, normalized size = 0.91

$$-\frac{2\,\mathrm{atanh}\left(\frac{\sqrt{b\,\mathrm{e}^{d\,x}\,\mathrm{e}^{c}-a}}{\sqrt{-a}}\right)}{\sqrt{-a}\;d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*exp(c + d*x) - a)^(1/2),x)
```

```
[Out] -(2*atanh((b*exp(d*x)*exp(c) - a)^(1/2)/(-a)^(1/2)))/((-a)^(1/2)*d)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{1}{\sqrt{-a+be^{c+dx}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-a+b*exp(d*x+c))**(1/2),x)
```

```
[Out] Integral(1/sqrt(-a + b*exp(c + d*x)), x)
```

3.700 $\int \sqrt{a+be^{c+dx}}\,dx$

Optimal. Leaf size=53

$$\frac{2\sqrt{a+be^{c+dx}}}{d}-\frac{2\sqrt{a}\tanh^{-1}\left(\frac{\sqrt{a+be^{c+dx}}}{\sqrt{a}}\right)}{d}$$

```
[Out] -2*arctanh((a+b*exp(d*x+c))^(1/2)/a^(1/2))*a^(1/2)/d+2*(a+b*exp(d*x+c))^(1/
2)/d
```

Rubi [A] time = 0.03, antiderivative size = 53, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267, Rules used = {2282, 50, 63, 208}

$$\frac{2\sqrt{a+be^{c+dx}}}{d}-\frac{2\sqrt{a}\tanh^{-1}\left(\frac{\sqrt{a+be^{c+dx}}}{\sqrt{a}}\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[a + b*E^(c + d*x)],x]
```

```
[Out] (2*Sqrt[a + b*E^(c + d*x)])/d - (2*Sqrt[a]*ArcTanh[Sqrt[a + b*E^(c + d*x)]/
Sqrt[a]])/d
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}
\int \sqrt{a+be^{c+dx}}\,dx &= \frac{\text{Subst}\left(\int \frac{\sqrt{a+bx}}{x}\,dx, x, e^{c+dx}\right)}{d} \\
&= \frac{2\sqrt{a+be^{c+dx}}}{d} + \frac{a\,\text{Subst}\left(\int \frac{1}{x\sqrt{a+bx}}\,dx, x, e^{c+dx}\right)}{d} \\
&= \frac{2\sqrt{a+be^{c+dx}}}{d} + \frac{(2a)\,\text{Subst}\left(\int \frac{1}{-\frac{a}{b}+\frac{x^2}{b}}\,dx, x, \sqrt{a+be^{c+dx}}\right)}{bd} \\
&= \frac{2\sqrt{a+be^{c+dx}}}{d} - \frac{2\sqrt{a}\,\tanh^{-1}\left(\frac{\sqrt{a+be^{c+dx}}}{\sqrt{a}}\right)}{d}
\end{aligned}$$

Mathematica [A] time = 0.02, size = 51, normalized size = 0.96

$$\frac{2\sqrt{a+be^{c+dx}} - 2\sqrt{a}\,\tanh^{-1}\left(\frac{\sqrt{a+be^{c+dx}}}{\sqrt{a}}\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[a + b*E^(c + d*x)],x]
```

```
[Out] (2*Sqrt[a + b*E^(c + d*x)] - 2*Sqrt[a]*ArcTanh[Sqrt[a + b*E^(c + d*x)]/Sqrt
[a]])/d
```

fricas [A] time = 0.44, size = 110, normalized size = 2.08

$$\left[\frac{\sqrt{a}\log\left(\left(be^{(dx+c)}-2\sqrt{be^{(dx+c)}+a}\sqrt{a}+2a\right)e^{(-dx-c)}\right)+2\sqrt{be^{(dx+c)}+a}}{d}, \frac{2\left(\sqrt{-a}\arctan\left(\frac{\sqrt{be^{(dx+c)}+a}\sqrt{-a}}{a}\right)+\sqrt{b\right.}}{d}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] [(sqrt(a)*log((b*e^(d*x + c) - 2*sqrt(b*e^(d*x + c) + a)*sqrt(a) + 2*a)*e^(
-d*x - c)) + 2*sqrt(b*e^(d*x + c) + a))/d, 2*(sqrt(-a)*arctan(sqrt(b*e^(d*x
 + c) + a)*sqrt(-a)/a) + sqrt(b*e^(d*x + c) + a))/d]
```

giac [A] time = 0.21, size = 44, normalized size = 0.83

$$\frac{2\left(\frac{a\arctan\left(\frac{\sqrt{be^{(dx+c)}+a}}{\sqrt{-a}}\right)}{\sqrt{-a}}+\sqrt{be^{(dx+c)}+a}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] 2*(a*arctan(sqrt(b*e^(d*x + c) + a)/sqrt(-a))/sqrt(-a) + sqrt(b*e^(d*x + c)
 + a))/d
```

maple [A] time = 0.03, size = 42, normalized size = 0.79

$$\frac{-2\sqrt{a}\ \operatorname{arctanh}\left(\frac{\sqrt{b\,\mathrm{e}^{dx+c}+a}}{\sqrt{a}}\right)+2\sqrt{b\,\mathrm{e}^{dx+c}+a}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*exp(d*x+c)+a)^(1/2),x)
```

```
[Out] 1/d*(2*(b*exp(d*x+c)+a)^(1/2)-2*a^(1/2)*arctanh((b*exp(d*x+c)+a)^(1/2)/a^(1
/2)))
```

maxima [A] time = 2.38, size = 63, normalized size = 1.19

$$\frac{\sqrt{a}\log\left(\frac{\sqrt{be^{(dx+c)}+a}-\sqrt{a}}{\sqrt{be^{(dx+c)}+a}+\sqrt{a}}\right)}{d}+\frac{2\sqrt{be^{(dx+c)}+a}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] sqrt(a)*log((sqrt(b*e^(d*x + c) + a) - sqrt(a))/(sqrt(b*e^(d*x + c) + a) +
sqrt(a)))/d + 2*sqrt(b*e^(d*x + c) + a)/d
```

mupad [B] time = 3.52, size = 43, normalized size = 0.81

$$\frac{2\sqrt{a+b\,\mathrm{e}^{c+d\,x}}}{d}-\frac{2\sqrt{a}\,\mathrm{atanh}\left(\frac{\sqrt{a+b\,\mathrm{e}^{d\,x}\,\mathrm{e}^{c}}}{\sqrt{a}}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*exp(c + d*x))^(1/2),x)
```

```
[Out] (2*(a + b*exp(c + d*x))^(1/2))/d - (2*a^(1/2)*atanh((a + b*exp(d*x)*exp(c))
^(1/2)/a^(1/2)))/d
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{a+be^{c+dx}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*exp(d*x+c))**(1/2),x)
```

```
[Out] Integral(sqrt(a + b*exp(c + d*x)), x)
```

3.701 $\int \sqrt{-a+be^{c+dx}}\,dx$

Optimal. Leaf size=57

$$\frac{2\sqrt{be^{c+dx}-a}}{d}-\frac{2\sqrt{a}\tan^{-1}\left(\frac{\sqrt{be^{c+dx}-a}}{\sqrt{a}}\right)}{d}$$

```
[Out] -2*arctan((-a+b*exp(d*x+c))^(1/2)/a^(1/2))*a^(1/2)/d+2*(-a+b*exp(d*x+c))^(1
/2)/d
```

Rubi [A] time = 0.04, antiderivative size = 57, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.235, Rules used = {2282, 50, 63, 205}

$$\frac{2\sqrt{be^{c+dx}-a}}{d}-\frac{2\sqrt{a}\tan^{-1}\left(\frac{\sqrt{be^{c+dx}-a}}{\sqrt{a}}\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[-a + b*E^(c + d*x)],x]
```

```
[Out] (2*Sqrt[-a + b*E^(c + d*x)])/d - (2*Sqrt[a]*ArcTan[Sqrt[-a + b*E^(c + d*x)]
/Sqrt[a]])/d
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$
\begin{aligned}
\int \sqrt{-a+be^{c+dx}}\,dx &= \frac{\operatorname{Subst}\left(\int \frac{\sqrt{-a+bx}}{x}\,dx, x, e^{c+dx}\right)}{d}\\
&= \frac{2\sqrt{-a+be^{c+dx}}}{d} - \frac{a\operatorname{Subst}\left(\int \frac{1}{x\sqrt{-a+bx}}\,dx, x, e^{c+dx}\right)}{d}\\
&= \frac{2\sqrt{-a+be^{c+dx}}}{d} - \frac{(2a)\operatorname{Subst}\left(\int \frac{1}{\frac{a}{b}+\frac{x^2}{b}}\,dx, x, \sqrt{-a+be^{c+dx}}\right)}{bd}\\
&= \frac{2\sqrt{-a+be^{c+dx}}}{d} - \frac{2\sqrt{a}\tan^{-1}\left(\frac{\sqrt{-a+be^{c+dx}}}{\sqrt{a}}\right)}{d}
\end{aligned}
$$

Mathematica [A] time = 0.02, size = 55, normalized size = 0.96

$$
\frac{2\sqrt{be^{c+dx}-a} - 2\sqrt{a}\tan^{-1}\left(\frac{\sqrt{be^{c+dx}-a}}{\sqrt{a}}\right)}{d}
$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[-a + b*E^(c + d*x)],x]
```

```
[Out] (2*Sqrt[-a + b*E^(c + d*x)] - 2*Sqrt[a]*ArcTan[Sqrt[-a + b*E^(c + d*x)]/Sqr
t[a]])/d
```

fricas [A] time = 0.41, size = 117, normalized size = 2.05

$$\left[\frac{\sqrt{-a}\log\left(\left(be^{(dx+c)} - 2\sqrt{be^{(dx+c)} - a}\sqrt{-a} - 2a\right)e^{(-dx-c)}\right) + 2\sqrt{be^{(dx+c)} - a}}{d}, -\frac{2\left(\sqrt{a}\arctan\left(\frac{\sqrt{be^{(dx+c)}-a}}{\sqrt{a}}\right) - \sqrt{be^{(dx+c)} - a}\right)}{d}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a+b*exp(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] [(sqrt(-a)*log((b*e^(d*x + c) - 2*sqrt(b*e^(d*x + c) - a)*sqrt(-a) - 2*a)*e
^(-d*x - c)) + 2*sqrt(b*e^(d*x + c) - a))/d, -2*(sqrt(a)*arctan(sqrt(b*e^(d
*x + c) - a)/sqrt(a)) - sqrt(b*e^(d*x + c) - a))/d]
```

giac [A] time = 0.22, size = 45, normalized size = 0.79

$$-\frac{2\left(\sqrt{a}\arctan\left(\frac{\sqrt{be^{(dx+c)}-a}}{\sqrt{a}}\right) - \sqrt{be^{(dx+c)} - a}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a+b*exp(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] -2*(sqrt(a)*arctan(sqrt(b*e^(d*x + c) - a)/sqrt(a)) - sqrt(b*e^(d*x + c) -
a))/d
```

maple [A] time = 0.03, size = 48, normalized size = 0.84

$$-\frac{2\sqrt{a}\,\arctan\left(\frac{\sqrt{b\,e^{dx+c}-a}}{\sqrt{a}}\right)}{d} + \frac{2\sqrt{b\,e^{dx+c} - a}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*exp(d*x+c)-a)^(1/2),x)
```

```
[Out] -2*arctan((b*exp(d*x+c)-a)^(1/2)/a^(1/2))*a^(1/2)/d+2*(b*exp(d*x+c)-a)^(1/2
)/d
```

maxima [A] time = 2.19, size = 47, normalized size = 0.82

$$-\frac{2\sqrt{a}\arctan\left(\frac{\sqrt{be^{(dx+c)}-a}}{\sqrt{a}}\right)}{d} + \frac{2\sqrt{be^{(dx+c)} - a}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a+b*exp(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] -2*sqrt(a)*arctan(sqrt(b*e^(d*x + c) - a)/sqrt(a))/d + 2*sqrt(b*e^(d*x + c)
 - a)/d
```

mupad [B] time = 3.60, size = 47, normalized size = 0.82

$$\frac{2\sqrt{b\,\mathrm{e}^{c+d\,x}-a}}{d}-\frac{2\,\sqrt{a}\,\mathrm{atan}\left(\frac{\sqrt{b\,\mathrm{e}^{d\,x}\,\mathrm{e}^{c}-a}}{\sqrt{a}}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*exp(c + d*x) - a)^(1/2),x)
```

```
[Out] (2*(b*exp(c + d*x) - a)^(1/2))/d - (2*a^(1/2)*atan((b*exp(d*x)*exp(c) - a)^
(1/2)/a^(1/2)))/d
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{-a + be^{c+dx}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a+b*exp(d*x+c))**(1/2),x)
```

```
[Out] Integral(sqrt(-a + b*exp(c + d*x)), x)
```

3.702 $\int e^{6x} \sin(3x)\, dx$

Optimal. Leaf size=27

$$\frac{2}{15}e^{6x}\sin(3x) - \frac{1}{15}e^{6x}\cos(3x)$$

```
[Out] -1/15*exp(6*x)*cos(3*x)+2/15*exp(6*x)*sin(3*x)
```

Rubi [A] time = 0.01, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {4432}

$$\frac{2}{15}e^{6x}\sin(3x) - \frac{1}{15}e^{6x}\cos(3x)$$

Antiderivative was successfully verified.

```
[In] Int[E^(6*x)*Sin[3*x],x]
[Out] -(E^(6*x)*Cos[3*x])/15 + (2*E^(6*x)*Sin[3*x])/15
```

Rule 4432

```
Int[(F_)^((c_.)*((a_.) + (b_.)*(x_)))*Sin[(d_.) + (e_.)*(x_)], x_Symbol] :>
 Simp[(b*c*Log[F]*F^(c*(a + b*x))*Sin[d + e*x])/(e^2 + b^2*c^2*Log[F]^2), x
] - Simp[(e*F^(c*(a + b*x))*Cos[d + e*x])/(e^2 + b^2*c^2*Log[F]^2), x] /; F
reeQ[{F, a, b, c, d, e}, x] && NeQ[e^2 + b^2*c^2*Log[F]^2, 0]
```

Rubi steps

$$\int e^{6x}\sin(3x)\,dx = -\frac{1}{15}e^{6x}\cos(3x) + \frac{2}{15}e^{6x}\sin(3x)$$

Mathematica [A] time = 0.02, size = 20, normalized size = 0.74

$$-\frac{1}{15}e^{6x}(\cos(3x) - 2\sin(3x))$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(6*x)*Sin[3*x],x]
[Out] -1/15*(E^(6*x)*(Cos[3*x] - 2*Sin[3*x]))
```

fricas [A] time = 0.40, size = 21, normalized size = 0.78

$$-\frac{1}{15}\cos\left(3\,x\right)e^{\left(6\,x\right)}+\frac{2}{15}\,e^{\left(6\,x\right)}\sin\left(3\,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(6*x)*sin(3*x),x, algorithm="fricas")
[Out] -1/15*cos(3*x)*e^(6*x) + 2/15*e^(6*x)*sin(3*x)
```

giac [A] time = 0.21, size = 17, normalized size = 0.63

$$-\frac{1}{15}\left(\cos\left(3\,x\right)-2\,\sin\left(3\,x\right)\right)e^{\left(6\,x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(6*x)*sin(3*x),x, algorithm="giac")
[Out] -1/15*(cos(3*x) - 2*sin(3*x))*e^(6*x)
```

maple [A] time = 0.08, size = 22, normalized size = 0.81

$$-\frac{\cos\left(3x\right)\mathrm{e}^{6x}}{15}+\frac{2\,\mathrm{e}^{6x}\sin\left(3x\right)}{15}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(6*x)*sin(3*x),x)
[Out] -1/15*exp(6*x)*cos(3*x)+2/15*exp(6*x)*sin(3*x)
```

maxima [A] time = 0.93, size = 17, normalized size = 0.63

$$-\frac{1}{15}\left(\cos\left(3\,x\right)-2\,\sin\left(3\,x\right)\right)e^{\left(6\,x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(6*x)*sin(3*x),x, algorithm="maxima")
[Out] -1/15*(cos(3*x) - 2*sin(3*x))*e^(6*x)
```

mupad [B] time = 0.03, size = 19, normalized size = 0.70

$$-\frac{\mathrm{e}^{6\,x}\,\left(3\,\cos\left(3\,x\right)-6\,\sin\left(3\,x\right)\right)}{45}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sin(3*x)*exp(6*x),x)
```

```
[Out] -(exp(6*x)*(3*cos(3*x) - 6*sin(3*x)))/45
```

sympy [A] time = 0.30, size = 24, normalized size = 0.89

$$\frac{2e^{6x}\sin(3x)}{15} - \frac{e^{6x}\cos(3x)}{15}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(6*x)*sin(3*x),x)
```

```
[Out] 2*exp(6*x)*sin(3*x)/15 - exp(6*x)*cos(3*x)/15
```

3.703 $\int \frac{e^{3x}}{1+e^{2x}} \, dx$

Optimal. Leaf size=10

$$e^x - \tan^{-1}(e^x)$$

[Out] exp(x)-arctan(exp(x))

Rubi [A] time = 0.02, antiderivative size = 10, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2248, 321, 203}

$$e^x - \tan^{-1}(e^x)$$

Antiderivative was successfully verified.

[In] Int[E^(3*x)/(1 + E^(2*x)),x]

[Out] E^x - ArcTan[E^x]

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2248

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(g*h*Log[G])/(d*e*Lo
g[F])]}, Dist[(Denominator[m]*G^(f*h - (c*g*h)/d))/(d*e*Log[F]), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^((e*(c + d*x))/De
nominator[m])], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int \frac{e^{3x}}{1+e^{2x}}\,dx = \text{Subst}\left(\int \frac{x^2}{1+x^2}\,dx, x, e^x\right)$$
$$= e^x - \text{Subst}\left(\int \frac{1}{1+x^2}\,dx, x, e^x\right)$$
$$= e^x - \tan^{-1}(e^x)$$

Mathematica [A] time = 0.01, size = 10, normalized size = 1.00

$$e^x - \tan^{-1}(e^x)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(3*x)/(1 + E^(2*x)),x]
[Out] E^x - ArcTan[E^x]
```

fricas [A] time = 0.41, size = 8, normalized size = 0.80

$$-\arctan(e^x) + e^x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(3*x)/(1+exp(2*x)),x, algorithm="fricas")
[Out] -arctan(e^x) + e^x
```

giac [A] time = 0.21, size = 8, normalized size = 0.80

$$-\arctan(e^x) + e^x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(3*x)/(1+exp(2*x)),x, algorithm="giac")
[Out] -arctan(e^x) + e^x
```

maple [A] time = 0.03, size = 9, normalized size = 0.90

$$-\arctan(\mathrm{e}^x) + \mathrm{e}^x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(3*x)/(exp(2*x)+1),x)
```

```
[Out] exp(x)-arctan(exp(x))
```

maxima [A] time = 1.93, size = 8, normalized size = 0.80

$$-\arctan\left(e^{x}\right)+e^{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(3*x)/(1+exp(2*x)),x, algorithm="maxima")
[Out] -arctan(e^x) + e^x
```

mupad [B] time = 0.08, size = 8, normalized size = 0.80

$$\mathrm{e}^{x}-\mathrm{atan}\left(\mathrm{e}^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(3*x)/(exp(2*x) + 1),x)
[Out] exp(x) - atan(exp(x))
```

sympy [B] time = 0.12, size = 19, normalized size = 1.90

$$e^{x}+\operatorname{RootSum}\left(4z^{2}+1,\left(i\mapsto i\log\left(-2i+e^{x}\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(3*x)/(1+exp(2*x)),x)
[Out] exp(x) + RootSum(4*_z**2 + 1, Lambda(_i, _i*log(-2*_i + exp(x))))
```

3.704 $\int \frac{e^{3x}}{-1+e^{2x}}\,dx$

Optimal. Leaf size=10

$$e^x - \tanh^{-1}(e^x)$$

```
[Out] exp(x)-arctanh(exp(x))
```

Rubi [A] time = 0.02, antiderivative size = 10, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {2248, 321, 207}

$$e^x - \tanh^{-1}(e^x)$$

Antiderivative was successfully verified.

```
[In] Int[E^(3*x)/(-1 + E^(2*x)),x]
```

```
[Out] E^x - ArcTanh[E^x]
```

Rule 207

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTanh[(Rt[b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (LtQ[a
, 0] || GtQ[b, 0])
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2248

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(g*h*Log[G])/(d*e*Lo
g[F])]}, Dist[(Denominator[m]*G^(f*h - (c*g*h)/d))/(d*e*Log[F]), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^((e*(c + d*x))/De
nominator[m])], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int \frac{e^{3x}}{-1+e^{2x}}\,dx = \text{Subst}\left(\int \frac{x^2}{-1+x^2}\,dx, x, e^x\right)$$
$$= e^x + \text{Subst}\left(\int \frac{1}{-1+x^2}\,dx, x, e^x\right)$$
$$= e^x - \tanh^{-1}\left(e^x\right)$$

Mathematica [A] time = 0.01, size = 10, normalized size = 1.00

$$e^x - \tanh^{-1}\left(e^x\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(3*x)/(-1 + E^(2*x)),x]
[Out] E^x - ArcTanh[E^x]
```

fricas [B] time = 0.41, size = 17, normalized size = 1.70

$$e^x - \frac{1}{2}\,\log\left(e^x+1\right) + \frac{1}{2}\,\log\left(e^x-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(3*x)/(-1+exp(2*x)),x, algorithm="fricas")
[Out] e^x - 1/2*log(e^x + 1) + 1/2*log(e^x - 1)
```

giac [B] time = 0.21, size = 18, normalized size = 1.80

$$e^x - \frac{1}{2}\,\log\left(e^x+1\right) + \frac{1}{2}\,\log\left(|e^x-1|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(3*x)/(-1+exp(2*x)),x, algorithm="giac")
[Out] e^x - 1/2*log(e^x + 1) + 1/2*log(abs(e^x - 1))
```

maple [B] time = 0.03, size = 18, normalized size = 1.80

$$e^x + \frac{\ln\left(e^x-1\right)}{2} - \frac{\ln\left(e^x+1\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(3*x)/(exp(2*x)-1),x)
```

```
[Out] exp(x)+1/2*ln(exp(x)-1)-1/2*ln(exp(x)+1)
```

maxima [B] time = 0.95, size = 17, normalized size = 1.70

$$e^{x} - \frac{1}{2} \log \left(e^{x} + 1\right) + \frac{1}{2} \log \left(e^{x} - 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(3*x)/(-1+exp(2*x)),x, algorithm="maxima")
```

```
[Out] e^x - 1/2*log(e^x + 1) + 1/2*log(e^x - 1)
```

mupad [B] time = 0.10, size = 17, normalized size = 1.70

$$\frac{\ln \left(\mathrm{e}^{x} - 1\right)}{2} - \frac{\ln \left(\mathrm{e}^{x} + 1\right)}{2} + \mathrm{e}^{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(3*x)/(exp(2*x) - 1),x)
```

```
[Out] log(exp(x) - 1)/2 - log(exp(x) + 1)/2 + exp(x)
```

sympy [B] time = 0.12, size = 19, normalized size = 1.90

$$e^{x} + \frac{\log \left(e^{x} - 1\right)}{2} - \frac{\log \left(e^{x} + 1\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(3*x)/(-1+exp(2*x)),x)
```

```
[Out] exp(x) + log(exp(x) - 1)/2 - log(exp(x) + 1)/2
```

3.705 $\int \frac{e^{-x}}{\sqrt{1+e^{2x}}}\,dx$

Optimal. Leaf size=18

$$-e^{-x}\sqrt{e^{2x}+1}$$

```
[Out] -(1+exp(2*x))^(1/2)/exp(x)
```

Rubi [A] time = 0.03, antiderivative size = 18, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118, Rules used = {2249, 191}

$$-e^{-x}\sqrt{e^{2x}+1}$$

Antiderivative was successfully verified.

```
[In] Int[1/(E^x*Sqrt[1 + E^(2*x)]),x]
```

```
[Out] -(Sqrt[1 + E^(2*x)]/E^x)
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{e^{-x}}{\sqrt{1+e^{2x}}}\,dx &= -\text{Subst}\left(\int \frac{1}{\sqrt{1+\frac{1}{x^2}}}\,dx, x, e^{-x}\right)\\ &= -e^{-x}\sqrt{1+e^{2x}}\end{aligned}$$

Mathematica [A] time = 0.01, size = 18, normalized size = 1.00

$$-e^{-x}\sqrt{e^{2x}+1}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(E^x*Sqrt[1 + E^(2*x)]),x]
[Out] -(Sqrt[1 + E^(2*x)]/E^x)
```

fricas [A] time = 0.39, size = 10, normalized size = 0.56

$$-\sqrt{e^{(-2x)} + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/exp(x)/(1+exp(2*x))^(1/2),x, algorithm="fricas")
[Out] -sqrt(e^(-2*x) + 1)
```

giac [A] time = 0.24, size = 21, normalized size = 1.17

$$\frac{2}{\left(\sqrt{e^{(2x)} + 1} - e^x\right)^2 - 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/exp(x)/(1+exp(2*x))^(1/2),x, algorithm="giac")
[Out] 2/((sqrt(e^(2*x) + 1) - e^x)^2 - 1)
```

maple [A] time = 0.04, size = 15, normalized size = 0.83

$$-\sqrt{e^{2x} + 1}\, e^{-x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/exp(x)/(exp(2*x)+1)^(1/2),x)
[Out] -1/exp(x)*(1+exp(x)^2)^(1/2)
```

maxima [A] time = 0.99, size = 14, normalized size = 0.78

$$-\sqrt{e^{(2x)} + 1}\, e^{(-x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/exp(x)/(1+exp(2*x))^(1/2),x, algorithm="maxima")
[Out] -sqrt(e^(2*x) + 1)*e^(-x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.06

$$\int \frac{\mathrm{e}^{-x}}{\sqrt{\mathrm{e}^{2\,x}+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(-x)/(exp(2*x) + 1)^(1/2),x)
[Out] int(exp(-x)/(exp(2*x) + 1)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{-x}}{\sqrt{e^{2x}+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/exp(x)/(1+exp(2*x))**(1/2),x)
[Out] Integral(exp(-x)/sqrt(exp(2*x) + 1), x)
```

3.706 $\int \frac{e^x}{-1-8e^x+e^{2x}} \, dx$

Optimal. Leaf size=20

$$\frac{\tanh^{-1}\left(\frac{4-e^x}{\sqrt{17}}\right)}{\sqrt{17}}$$

```
[Out] 1/17*arctanh(1/17*(4-exp(x))*17^(1/2))*17^(1/2)
```

Rubi [A] time = 0.04, antiderivative size = 20, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {2282, 618, 206}

$$\frac{\tanh^{-1}\left(\frac{4-e^x}{\sqrt{17}}\right)}{\sqrt{17}}$$

Antiderivative was successfully verified.

```
[In] Int[E^x/(-1 - 8*E^x + E^(2*x)),x]
```

```
[Out] ArcTanh[(4 - E^x)/Sqrt[17]]/Sqrt[17]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 618

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> Dist[-2, Subst[I
nt[1/Simp[b^2 - 4*a*c - x^2, x], x], x, b + 2*c*x], x] /; FreeQ[{a, b, c},
x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\int \frac{e^x}{-1-8e^x+e^{2x}}\,dx = \text{Subst}\left(\int \frac{1}{-1-8x+x^2}\,dx, x, e^x\right)$$
$$= -\left(2\,\text{Subst}\left(\int \frac{1}{68-x^2}\,dx, x, -8+2e^x\right)\right)$$
$$= \frac{\tanh^{-1}\left(\frac{4-e^x}{\sqrt{17}}\right)}{\sqrt{17}}$$

Mathematica [A] time = 0.01, size = 19, normalized size = 0.95

$$-\frac{\tanh^{-1}\left(\frac{e^x-4}{\sqrt{17}}\right)}{\sqrt{17}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x/(-1 - 8*E^x + E^(2*x)),x]
[Out] -(ArcTanh[(-4 + E^x)/Sqrt[17]]/Sqrt[17])
```

fricas [B] time = 0.40, size = 42, normalized size = 2.10

$$\frac{1}{34}\sqrt{17}\log\left(-\frac{2\left(\sqrt{17}+4\right)e^x - 8\sqrt{17} - e^{(2x)} - 33}{e^{(2x)} - 8e^x - 1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(-1-8*exp(x)+exp(2*x)),x, algorithm="fricas")
[Out] 1/34*sqrt(17)*log(-(2*(sqrt(17) + 4)*e^x - 8*sqrt(17) - e^(2*x) - 33)/(e^(2
*x) - 8*e^x - 1))
```

giac [B] time = 0.23, size = 33, normalized size = 1.65

$$\frac{1}{34}\sqrt{17}\log\left(\frac{\left|-2\sqrt{17}+2e^x-8\right|}{\left|2\sqrt{17}+2e^x-8\right|}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(-1-8*exp(x)+exp(2*x)),x, algorithm="giac")
[Out] 1/34*sqrt(17)*log(abs(-2*sqrt(17) + 2*e^x - 8)/abs(2*sqrt(17) + 2*e^x - 8))
```

maple [A] time = 0.03, size = 18, normalized size = 0.90

$$-\frac{\sqrt{17}\ \operatorname{arctanh}\left(\frac{(2\,e^{x}-8)\sqrt{17}}{34}\right)}{17}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(-1-8*exp(x)+exp(2*x)),x)
[Out] -1/17*17^(1/2)*arctanh(1/34*(2*exp(x)-8)*17^(1/2))
```

maxima [A] time = 2.07, size = 26, normalized size = 1.30

$$\frac{1}{34}\sqrt{17}\log\left(-\frac{\sqrt{17}-e^{x}+4}{\sqrt{17}+e^{x}-4}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(-1-8*exp(x)+exp(2*x)),x, algorithm="maxima")
[Out] 1/34*sqrt(17)*log(-(sqrt(17) - e^x + 4)/(sqrt(17) + e^x - 4))
```

mupad [B] time = 0.39, size = 17, normalized size = 0.85

$$-\frac{\sqrt{17}\ \operatorname{atanh}\left(\frac{\sqrt{17}\ (2\,e^{x}-8)}{34}\right)}{17}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-exp(x)/(8*exp(x) - exp(2*x) + 1),x)
[Out] -(17^(1/2)*atanh((17^(1/2)*(2*exp(x) - 8))/34))/17
```

sympy [A] time = 0.13, size = 17, normalized size = 0.85

$$\operatorname{RootSum}\left(68z^{2}-1,\left(i\mapsto i\log\left(-34i+e^{x}-4\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(-1-8*exp(x)+exp(2*x)),x)
[Out] RootSum(68*_z**2 - 1, Lambda(_i, _i*log(-34*_i + exp(x) - 4)))
```

3.707 $\int e^{7x}x^3\,dx$

Optimal. Leaf size=44

$$\frac{1}{7}e^{7x}x^3-\frac{3}{49}e^{7x}x^2+\frac{6}{343}e^{7x}x-\frac{6e^{7x}}{2401}$$

```
[Out] -6/2401*exp(7*x)+6/343*exp(7*x)*x-3/49*exp(7*x)*x^2+1/7*exp(7*x)*x^3
```

Rubi [A] time = 0.03, antiderivative size = 44, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {2176, 2194}

$$\frac{1}{7}e^{7x}x^3-\frac{3}{49}e^{7x}x^2+\frac{6}{343}e^{7x}x-\frac{6e^{7x}}{2401}$$

Antiderivative was successfully verified.

```
[In] Int[E^(7*x)*x^3,x]
```

```
[Out] (-6*E^(7*x))/2401 + (6*E^(7*x)*x)/343 - (3*E^(7*x)*x^2)/49 + (E^(7*x)*x^3)/
7
```

Rule 2176

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_.), x_Symbol] :> Simp[((c + d*x)^m*(b*F^(g*(e + f*x)))^n)/(f*g*n*Log[F]),
x] - Dist[(d*m)/(f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*(b*F^(g*(e + f*x)))^n
, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && GtQ[m, 0] && IntegerQ[2*m
] &&  !$UseGamma === True
```

Rule 2194

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rubi steps

$$\begin{aligned}\int e^{7x}x^3\,dx &= \frac{1}{7}e^{7x}x^3 - \frac{3}{7}\int e^{7x}x^2\,dx\\ &= -\frac{3}{49}e^{7x}x^2 + \frac{1}{7}e^{7x}x^3 + \frac{6}{49}\int e^{7x}x\,dx\\ &= \frac{6}{343}e^{7x}x - \frac{3}{49}e^{7x}x^2 + \frac{1}{7}e^{7x}x^3 - \frac{6}{343}\int e^{7x}\,dx\\ &= -\frac{6e^{7x}}{2401} + \frac{6}{343}e^{7x}x - \frac{3}{49}e^{7x}x^2 + \frac{1}{7}e^{7x}x^3\end{aligned}$$

Mathematica [A] time = 0.01, size = 24, normalized size = 0.55

$$\frac{e^{7x}\left(343x^3 - 147x^2 + 42x - 6\right)}{2401}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(7*x)*x^3,x]
[Out] (E^(7*x)*(-6 + 42*x - 147*x^2 + 343*x^3))/2401
```

fricas [A] time = 0.39, size = 21, normalized size = 0.48

$$\frac{1}{2401}\left(343\,x^3 - 147\,x^2 + 42\,x - 6\right)e^{(7\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(7*x)*x^3,x, algorithm="fricas")
[Out] 1/2401*(343*x^3 - 147*x^2 + 42*x - 6)*e^(7*x)
```

giac [A] time = 0.22, size = 21, normalized size = 0.48

$$\frac{1}{2401}\left(343\,x^3 - 147\,x^2 + 42\,x - 6\right)e^{(7\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(7*x)*x^3,x, algorithm="giac")
[Out] 1/2401*(343*x^3 - 147*x^2 + 42*x - 6)*e^(7*x)
```

maple [A] time = 0.02, size = 22, normalized size = 0.50

$$\frac{\left(343x^3 - 147x^2 + 42x - 6\right)\mathrm{e}^{7x}}{2401}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(7*x)*x^3,x)
```

```
[Out] 1/2401*(343*x^3-147*x^2+42*x-6)*exp(7*x)
```

maxima [A] time = 0.85, size = 21, normalized size = 0.48

$$\frac{1}{2401}\left(343\,x^3-147\,x^2+42\,x-6\right)e^{(7\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(7*x)*x^3,x, algorithm="maxima")
```

```
[Out] 1/2401*(343*x^3 - 147*x^2 + 42*x - 6)*e^(7*x)
```

mupad [B] time = 0.03, size = 21, normalized size = 0.48

$$\frac{\mathrm{e}^{7\,x}\,\left(343\,x^3-147\,x^2+42\,x-6\right)}{2401}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*exp(7*x),x)
```

```
[Out] (exp(7*x)*(42*x - 147*x^2 + 343*x^3 - 6))/2401
```

sympy [A] time = 0.09, size = 20, normalized size = 0.45

$$\frac{\left(343x^3-147x^2+42x-6\right)e^{7x}}{2401}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(7*x)*x**3,x)
```

```
[Out] (343*x**3 - 147*x**2 + 42*x - 6)*exp(7*x)/2401
```

3.708 $\int e^{8-2x}x^3\,dx$

Optimal. Leaf size=52

$$-\frac{1}{2}e^{8-2x}x^3-\frac{3}{4}e^{8-2x}x^2-\frac{3}{4}e^{8-2x}x-\frac{3}{8}e^{8-2x}$$

```
[Out] -3/8*exp(8-2*x)-3/4*exp(8-2*x)*x-3/4*exp(8-2*x)*x^2-1/2*exp(8-2*x)*x^3
```

Rubi [A] time = 0.04, antiderivative size = 52, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182, Rules used = {2176, 2194}

$$-\frac{1}{2}e^{8-2x}x^3-\frac{3}{4}e^{8-2x}x^2-\frac{3}{4}e^{8-2x}x-\frac{3}{8}e^{8-2x}$$

Antiderivative was successfully verified.

```
[In] Int[E^(8 - 2*x)*x^3,x]
```

```
[Out] (-3*E^(8 - 2*x))/8 - (3*E^(8 - 2*x)*x)/4 - (3*E^(8 - 2*x)*x^2)/4 - (E^(8 -
2*x)*x^3)/2
```

Rule 2176

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_.), x_Symbol] :> Simp[((c + d*x)^m*(b*F^(g*(e + f*x)))^n)/(f*g*n*Log[F]),
x] - Dist[(d*m)/(f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*(b*F^(g*(e + f*x)))^n
, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && GtQ[m, 0] && IntegerQ[2*m
] &&  !$UseGamma === True
```

Rule 2194

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rubi steps

$$
\begin{aligned}
\int e^{8-2x}x^3\,dx &= -\frac{1}{2}e^{8-2x}x^3+\frac{3}{2}\int e^{8-2x}x^2\,dx\\
&= -\frac{3}{4}e^{8-2x}x^2-\frac{1}{2}e^{8-2x}x^3+\frac{3}{2}\int e^{8-2x}x\,dx\\
&= -\frac{3}{4}e^{8-2x}x-\frac{3}{4}e^{8-2x}x^2-\frac{1}{2}e^{8-2x}x^3+\frac{3}{4}\int e^{8-2x}\,dx\\
&= -\frac{3}{8}e^{8-2x}-\frac{3}{4}e^{8-2x}x-\frac{3}{4}e^{8-2x}x^2-\frac{1}{2}e^{8-2x}x^3
\end{aligned}
$$

Mathematica [A] time = 0.01, size = 26, normalized size = 0.50

$$-\frac{1}{8}e^{8-2x}\left(4x^3+6x^2+6x+3\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(8 - 2*x)*x^3,x]
```

```
[Out] -1/8*(E^(8 - 2*x)*(3 + 6*x + 6*x^2 + 4*x^3))
```

fricas [A] time = 0.39, size = 23, normalized size = 0.44

$$-\frac{1}{8}\left(4\,x^3+6\,x^2+6\,x+3\right)e^{(-2\,x+8)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(8-2*x)*x^3,x, algorithm="fricas")
```

```
[Out] -1/8*(4*x^3 + 6*x^2 + 6*x + 3)*e^(-2*x + 8)
```

giac [A] time = 0.21, size = 23, normalized size = 0.44

$$-\frac{1}{8}\left(4\,x^3+6\,x^2+6\,x+3\right)e^{(-2\,x+8)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(8-2*x)*x^3,x, algorithm="giac")
```

```
[Out] -1/8*(4*x^3 + 6*x^2 + 6*x + 3)*e^(-2*x + 8)
```

maple [A] time = 0.02, size = 24, normalized size = 0.46

$$-\frac{\left(4x^3+6x^2+6x+3\right)\mathrm{e}^{-2x+8}}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(8-2*x)*x^3,x)
```

```
[Out] -1/8*(4*x^3+6*x^2+6*x+3)*exp(8-2*x)
```

maxima [A] time = 0.97, size = 30, normalized size = 0.58

$$-\frac{1}{8}\left(4\,x^{3}e^{8}+6\,x^{2}e^{8}+6\,xe^{8}+3\,e^{8}\right)e^{(-2\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(8-2*x)*x^3,x, algorithm="maxima")
```

```
[Out] -1/8*(4*x^3*e^8 + 6*x^2*e^8 + 6*x*e^8 + 3*e^8)*e^(-2*x)
```

mupad [B] time = 0.05, size = 23, normalized size = 0.44

$$-\mathrm{e}^{8-2\,x}\,\left(\frac{x^3}{2}+\frac{3\,x^2}{4}+\frac{3\,x}{4}+\frac{3}{8}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*exp(8 - 2*x),x)
```

```
[Out] -exp(8 - 2*x)*((3*x)/4 + (3*x^2)/4 + x^3/2 + 3/8)
```

sympy [A] time = 0.09, size = 24, normalized size = 0.46

$$\frac{\left(-4x^{3}-6x^{2}-6x-3\right)e^{8-2x}}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(8-2*x)*x**3,x)
```

```
[Out] (-4*x**3 - 6*x**2 - 6*x - 3)*exp(8 - 2*x)/8
```

3.709 $\int e^x \sqrt{9-e^{2x}}\,dx$

Optimal. Leaf size=33

$$\frac{1}{2}e^x\sqrt{9-e^{2x}}+\frac{9}{2}\sin^{-1}\left(\frac{e^x}{3}\right)$$

```
[Out] 9/2*arcsin(1/3*exp(x))+1/2*exp(x)*(9-exp(2*x))^(1/2)
```

Rubi [A] time = 0.03, antiderivative size = 33, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.176, Rules used = {2249, 195, 216}

$$\frac{1}{2}e^x\sqrt{9-e^{2x}}+\frac{9}{2}\sin^{-1}\left(\frac{e^x}{3}\right)$$

Antiderivative was successfully verified.

```
[In] Int[E^x*Sqrt[9 - E^(2*x)],x]
```

```
[Out] (E^x*Sqrt[9 - E^(2*x)])/2 + (9*ArcSin[E^x/3])/2
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rubi steps

$$\int e^x\sqrt{9-e^{2x}}\,dx = \text{Subst}\left(\int \sqrt{9-x^2}\,dx, x, e^x\right)$$
$$= \frac{1}{2}e^x\sqrt{9-e^{2x}} + \frac{9}{2}\text{Subst}\left(\int \frac{1}{\sqrt{9-x^2}}\,dx, x, e^x\right)$$
$$= \frac{1}{2}e^x\sqrt{9-e^{2x}} + \frac{9}{2}\sin^{-1}\left(\frac{e^x}{3}\right)$$

Mathematica [A] time = 0.01, size = 32, normalized size = 0.97

$$\frac{1}{2}\left(e^x\sqrt{9-e^{2x}} + 9\sin^{-1}\left(\frac{e^x}{3}\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x*Sqrt[9 - E^(2*x)],x]
[Out] (E^x*Sqrt[9 - E^(2*x)] + 9*ArcSin[E^x/3])/2
```

fricas [A] time = 0.41, size = 35, normalized size = 1.06

$$\frac{1}{2}\sqrt{-e^{(2x)}+9}\,e^x - 9\arctan\left(\left(\sqrt{-e^{(2x)}+9} - 3\right)e^{(-x)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(9-exp(2*x))^(1/2),x, algorithm="fricas")
[Out] 1/2*sqrt(-e^(2*x) + 9)*e^x - 9*arctan((sqrt(-e^(2*x) + 9) - 3)*e^(-x))
```

giac [A] time = 0.22, size = 22, normalized size = 0.67

$$\frac{1}{2}\sqrt{-e^{(2x)}+9}\,e^x + \frac{9}{2}\arcsin\left(\frac{1}{3}e^x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(9-exp(2*x))^(1/2),x, algorithm="giac")
[Out] 1/2*sqrt(-e^(2*x) + 9)*e^x + 9/2*arcsin(1/3*e^x)
```

maple [A] time = 0.04, size = 23, normalized size = 0.70

$$\frac{9\arcsin\left(\frac{e^x}{3}\right)}{2} + \frac{\sqrt{-e^{2x}+9}\;e^x}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*(9-exp(2*x))^(1/2),x)
```

```
[Out] 1/2*exp(x)*(9-exp(x)^2)^(1/2)+9/2*arcsin(1/3*exp(x))
```

maxima [A] time = 2.31, size = 22, normalized size = 0.67

$$\frac{1}{2}\sqrt{-e^{(2x)}+9}\,e^{x}+\frac{9}{2}\,\arcsin\left(\frac{1}{3}\,e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(9-exp(2*x))^(1/2),x, algorithm="maxima")
```

```
[Out] 1/2*sqrt(-e^(2*x) + 9)*e^x + 9/2*arcsin(1/3*e^x)
```

mupad [B] time = 0.09, size = 22, normalized size = 0.67

$$\frac{9\,\mathrm{asin}\left(\frac{e^{x}}{3}\right)}{2}+\frac{e^{x}\,\sqrt{9-e^{2x}}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*(9 - exp(2*x))^(1/2),x)
```

```
[Out] (9*asin(exp(x)/3))/2 + (exp(x)*(9 - exp(2*x))^(1/2))/2
```

sympy [A] time = 1.41, size = 29, normalized size = 0.88

$$\begin{cases} \frac{\sqrt{9-e^{2x}}\,e^{x}}{2}+\frac{9\,\mathrm{asin}\left(\frac{e^{x}}{3}\right)}{2} & \text{for } e^{x}<\log(3) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(9-exp(2*x))**(1/2),x)
```

```
[Out] Piecewise((sqrt(9 - exp(2*x))*exp(x)/2 + 9*asin(exp(x)/3)/2, exp(x) < log(3
)))
```

3.710 $\int e^{6x}\sqrt{9-e^{2x}}\,dx$

Optimal. Leaf size=50

$$-\frac{1}{7}\left(9-e^{2x}\right)^{7/2}+\frac{18}{5}\left(9-e^{2x}\right)^{5/2}-27\left(9-e^{2x}\right)^{3/2}$$

```
[Out] -27*(9-exp(2*x))^(3/2)+18/5*(9-exp(2*x))^(5/2)-1/7*(9-exp(2*x))^(7/2)
```

Rubi [A] time = 0.04, antiderivative size = 50, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105, Rules used = {2248, 43}

$$-\frac{1}{7}\left(9-e^{2x}\right)^{7/2}+\frac{18}{5}\left(9-e^{2x}\right)^{5/2}-27\left(9-e^{2x}\right)^{3/2}$$

Antiderivative was successfully verified.

```
[In] Int[E^(6*x)*Sqrt[9 - E^(2*x)],x]
```

```
[Out] -27*(9 - E^(2*x))^(3/2) + (18*(9 - E^(2*x))^(5/2))/5 - (9 - E^(2*x))^(7/2)/
7
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2248

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(g*h*Log[G])/(d*e*Lo
g[F])]}, Dist[(Denominator[m]*G^(f*h - (c*g*h)/d))/(d*e*Log[F]), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^((e*(c + d*x))/De
nominator[m])], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int e^{6x}\sqrt{9-e^{2x}}\,dx = \frac{1}{2}\text{Subst}\left(\int \sqrt{9-x}\,x^2\,dx, x, e^{2x}\right)$$
$$= \frac{1}{2}\text{Subst}\left(\int \left(81\sqrt{9-x} - 18(9-x)^{3/2} + (9-x)^{5/2}\right)dx, x, e^{2x}\right)$$
$$= -27\left(9-e^{2x}\right)^{3/2} + \frac{18}{5}\left(9-e^{2x}\right)^{5/2} - \frac{1}{7}\left(9-e^{2x}\right)^{7/2}$$

Mathematica [A] time = 0.02, size = 33, normalized size = 0.66

$$-\frac{1}{35}\left(9-e^{2x}\right)^{3/2}\left(36e^{2x}+5e^{4x}+216\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(6*x)*Sqrt[9 - E^(2*x)],x]
[Out] -1/35*((9 - E^(2*x))^(3/2)*(216 + 36*E^(2*x) + 5*E^(4*x)))
```

fricas [A] time = 0.41, size = 32, normalized size = 0.64

$$\frac{1}{35}\left(5\,e^{(6\,x)} - 9\,e^{(4\,x)} - 108\,e^{(2\,x)} - 1944\right)\sqrt{-e^{(2\,x)}+9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(6*x)*(9-exp(2*x))^(1/2),x, algorithm="fricas")
[Out] 1/35*(5*e^(6*x) - 9*e^(4*x) - 108*e^(2*x) - 1944)*sqrt(-e^(2*x) + 9)
```

giac [A] time = 0.21, size = 53, normalized size = 1.06

$$\frac{1}{7}\left(e^{(2\,x)}-9\right)^3\sqrt{-e^{(2\,x)}+9} + \frac{18}{5}\left(e^{(2\,x)}-9\right)^2\sqrt{-e^{(2\,x)}+9} - 27\left(-e^{(2\,x)}+9\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(6*x)*(9-exp(2*x))^(1/2),x, algorithm="giac")
[Out] 1/7*(e^(2*x) - 9)^3*sqrt(-e^(2*x) + 9) + 18/5*(e^(2*x) - 9)^2*sqrt(-e^(2*x)
 + 9) - 27*(-e^(2*x) + 9)^(3/2)
```

maple [A] time = 0.04, size = 46, normalized size = 0.92

$$-\frac{36\left(-e^{2x}+9\right)^{\frac{3}{2}}e^{2x}}{35} - \frac{\left(-e^{2x}+9\right)^{\frac{3}{2}}e^{4x}}{7} - \frac{216\left(-e^{2x}+9\right)^{\frac{3}{2}}}{35}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(6*x)*(-exp(2*x)+9)^(1/2),x)
```

```
[Out] -1/7*exp(x)^4*(9-exp(x)^2)^(3/2)-36/35*exp(x)^2*(9-exp(x)^2)^(3/2)-216/35*(
9-exp(x)^2)^(3/2)
```

maxima [A] time = 0.82, size = 37, normalized size = 0.74

$$-\frac{1}{7}\left(-e^{(2x)}+9\right)^{\frac{7}{2}}+\frac{18}{5}\left(-e^{(2x)}+9\right)^{\frac{5}{2}}-27\left(-e^{(2x)}+9\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(6*x)*(9-exp(2*x))^(1/2),x, algorithm="maxima")
```

```
[Out] -1/7*(-e^(2*x) + 9)^(7/2) + 18/5*(-e^(2*x) + 9)^(5/2) - 27*(-e^(2*x) + 9)^(
3/2)
```

mupad [B] time = 3.57, size = 32, normalized size = 0.64

$$-\sqrt{9-\mathrm{e}^{2x}}\,\left(\frac{108\,\mathrm{e}^{2x}}{35}+\frac{9\,\mathrm{e}^{4x}}{35}-\frac{\mathrm{e}^{6x}}{7}+\frac{1944}{35}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(6*x)*(9 - exp(2*x))^(1/2),x)
```

```
[Out] -(9 - exp(2*x))^(1/2)*((108*exp(2*x))/35 + (9*exp(4*x))/35 - exp(6*x)/7 + 1
944/35)
```

sympy [A] time = 3.18, size = 41, normalized size = 0.82

$$\begin{cases} -\frac{\left(9-e^{2x}\right)^{\frac{7}{2}}}{7}+\frac{18\left(9-e^{2x}\right)^{\frac{5}{2}}}{5}-27\left(9-e^{2x}\right)^{\frac{3}{2}} & \text{for}\: e^{x} < \log{(3)} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(6*x)*(9-exp(2*x))**(1/2),x)
```

```
[Out] Piecewise((-(9 - exp(2*x))**(7/2)/7 + 18*(9 - exp(2*x))**(5/2)/5 - 27*(9 -
exp(2*x))**(3/2), exp(x) < log(3)))
```

3.711 $\int \frac{e^{6x}}{(9-e^x)^{5/2}} \, dx$

Optimal. Leaf size=81

$$\frac{2}{7}(9-e^x)^{7/2}-18(9-e^x)^{5/2}+540(9-e^x)^{3/2}-14580\sqrt{9-e^x}-\frac{65610}{\sqrt{9-e^x}}+\frac{39366}{(9-e^x)^{3/2}}$$

```
[Out] 39366/(9-exp(x))^(3/2)+540*(9-exp(x))^(3/2)-18*(9-exp(x))^(5/2)+2/7*(9-exp(
x))^(7/2)-65610/(9-exp(x))^(1/2)-14580*(9-exp(x))^(1/2)
```

Rubi [A] time = 0.05, antiderivative size = 81, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118, Rules used = {2248, 43}

$$\frac{2}{7}(9-e^x)^{7/2}-18(9-e^x)^{5/2}+540(9-e^x)^{3/2}-14580\sqrt{9-e^x}-\frac{65610}{\sqrt{9-e^x}}+\frac{39366}{(9-e^x)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[E^(6*x)/(9 - E^x)^(5/2),x]
```

```
[Out] 39366/(9 - E^x)^(3/2) - 65610/Sqrt[9 - E^x] - 14580*Sqrt[9 - E^x] + 540*(9
- E^x)^(3/2) - 18*(9 - E^x)^(5/2) + (2*(9 - E^x)^(7/2))/7
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2248

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(g*h*Log[G])/(d*e*Lo
g[F])]}, Dist[(Denominator[m]*G^(f*h - (c*g*h)/d))/(d*e*Log[F]), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^((e*(c + d*x))/De
nominator[m])], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$\int \frac{e^{6x}}{(9-e^x)^{5/2}}\,dx = \text{Subst}\left(\int \frac{x^5}{(9-x)^{5/2}}\,dx, x, e^x\right)$$
$$= \text{Subst}\left(\int \left(\frac{59049}{(9-x)^{5/2}} - \frac{32805}{(9-x)^{3/2}} + \frac{7290}{\sqrt{9-x}} - 810\sqrt{9-x} + 45(9-x)^{3/2} - (9-x)^{5/2}\right) dx, x,\right.$$
$$= \frac{39366}{(9-e^x)^{3/2}} - \frac{65610}{\sqrt{9-e^x}} - 14580\sqrt{9-e^x} + 540\,(9-e^x)^{3/2} - 18\,(9-e^x)^{5/2} + \frac{2}{7}\,(9-e^x)^{7/2}$$

Mathematica [A] time = 0.03, size = 48, normalized size = 0.59

$$-\frac{2\left(-839808e^x + 23328e^{2x} + 432e^{3x} + 18e^{4x} + e^{5x} + 5038848\right)}{7\,(9-e^x)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(6*x)/(9 - E^x)^(5/2),x]
```

```
[Out] (-2*(5038848 - 839808*E^x + 23328*E^(2*x) + 432*E^(3*x) + 18*E^(4*x) + E^(5
*x)))/(7*(9 - E^x)^(3/2))
```

fricas [A] time = 0.39, size = 50, normalized size = 0.62

$$-\frac{2\left(e^{(5\,x)} + 18\,e^{(4\,x)} + 432\,e^{(3\,x)} + 23328\,e^{(2\,x)} - 839808\,e^x + 5038848\right)\sqrt{-e^x+9}}{7\left(e^{(2\,x)} - 18\,e^x + 81\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(6*x)/(9-exp(x))^(5/2),x, algorithm="fricas")
```

```
[Out] -2/7*(e^(5*x) + 18*e^(4*x) + 432*e^(3*x) + 23328*e^(2*x) - 839808*e^x + 503
8848)*sqrt(-e^x + 9)/(e^(2*x) - 18*e^x + 81)
```

giac [A] time = 0.18, size = 75, normalized size = 0.93

$$-\frac{2}{7}\,(e^x-9)^3\sqrt{-e^x+9} - 18\,(e^x-9)^2\sqrt{-e^x+9} + 540\,(-e^x+9)^{\frac{3}{2}} - 14580\,\sqrt{-e^x+9} - \frac{13122\,(5\,e^x-42)}{(e^x-9)\sqrt{-e^x+9}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(6*x)/(9-exp(x))^(5/2),x, algorithm="giac")
```

```
[Out] -2/7*(e^x - 9)^3*sqrt(-e^x + 9) - 18*(e^x - 9)^2*sqrt(-e^x + 9) + 540*(-e^x
 + 9)^(3/2) - 14580*sqrt(-e^x + 9) - 13122*(5*e^x - 42)/((e^x - 9)*sqrt(-e^
x + 9))
```

maple [A] time = 0.04, size = 62, normalized size = 0.77

$$\frac{39366}{\left(-\mathrm{e}^{x}+9\right)^{\frac{3}{2}}}+540\left(-\mathrm{e}^{x}+9\right)^{\frac{3}{2}}-18\left(-\mathrm{e}^{x}+9\right)^{\frac{5}{2}}+\frac{2\left(-\mathrm{e}^{x}+9\right)^{\frac{7}{2}}}{7}-\frac{65610}{\sqrt{-\mathrm{e}^{x}+9}}-14580\sqrt{-\mathrm{e}^{x}+9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(6*x)/(9-exp(x))^(5/2),x)
```

```
[Out] 39366/(9-exp(x))^(3/2)+540*(9-exp(x))^(3/2)-18*(9-exp(x))^(5/2)+2/7*(9-exp(
x))^(7/2)-65610/(9-exp(x))^(1/2)-14580*(9-exp(x))^(1/2)
```

maxima [A] time = 0.97, size = 61, normalized size = 0.75

$$\frac{2}{7}\left(-e^{x}+9\right)^{\frac{7}{2}}-18\left(-e^{x}+9\right)^{\frac{5}{2}}+540\left(-e^{x}+9\right)^{\frac{3}{2}}-14580\sqrt{-e^{x}+9}-\frac{65610}{\sqrt{-e^{x}+9}}+\frac{39366}{\left(-e^{x}+9\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(6*x)/(9-exp(x))^(5/2),x, algorithm="maxima")
```

```
[Out] 2/7*(-e^x + 9)^(7/2) - 18*(-e^x + 9)^(5/2) + 540*(-e^x + 9)^(3/2) - 14580*s
qrt(-e^x + 9) - 65610/sqrt(-e^x + 9) + 39366/(-e^x + 9)^(3/2)
```

mupad [B] time = 0.19, size = 38, normalized size = 0.47

$$-\frac{2\left(23328\,\mathrm{e}^{2x}+432\,\mathrm{e}^{3x}+18\,\mathrm{e}^{4x}+\mathrm{e}^{5x}-839808\,\mathrm{e}^{x}+5038848\right)}{7\left(9-\mathrm{e}^{x}\right)^{3/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(6*x)/(9 - exp(x))^(5/2),x)
```

```
[Out] -(2*(23328*exp(2*x) + 432*exp(3*x) + 18*exp(4*x) + exp(5*x) - 839808*exp(x)
 + 5038848))/(7*(9 - exp(x))^(3/2))
```

sympy [A] time = 23.18, size = 61, normalized size = 0.75

$$\frac{2\left(9-e^{x}\right)^{\frac{7}{2}}}{7}-18\left(9-e^{x}\right)^{\frac{5}{2}}+540\left(9-e^{x}\right)^{\frac{3}{2}}-14580\sqrt{9-e^{x}}-\frac{65610}{\sqrt{9-e^{x}}}+\frac{39366}{\left(9-e^{x}\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(6*x)/(9-exp(x))**(5/2),x)
```

```
[Out] 2*(9 - exp(x))**(7/2)/7 - 18*(9 - exp(x))**(5/2) + 540*(9 - exp(x))**(3/2)
- 14580*sqrt(9 - exp(x)) - 65610/sqrt(9 - exp(x)) + 39366/(9 - exp(x))**(3/
2)
```

3.712 $\int \left(2-7e^{x^4}\right)^5 x^3\,dx$

Optimal. Leaf size=55

$$8x^4-140e^{x^4}+490e^{2x^4}-\frac{3430e^{3x^4}}{3}+\frac{12005e^{4x^4}}{8}-\frac{16807e^{5x^4}}{20}$$

```
[Out] -140*exp(x^4)+490*exp(2*x^4)-3430/3*exp(3*x^4)+12005/8*exp(4*x^4)-16807/20*
exp(5*x^4)+8*x^4
```

Rubi [A] time = 0.09, antiderivative size = 55, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {6715, 2282, 43}

$$8x^4-140e^{x^4}+490e^{2x^4}-\frac{3430e^{3x^4}}{3}+\frac{12005e^{4x^4}}{8}-\frac{16807e^{5x^4}}{20}$$

Antiderivative was successfully verified.

```
[In] Int[(2 - 7*E^x^4)^5*x^3,x]
```

```
[Out] -140*E^x^4 + 490*E^(2*x^4) - (3430*E^(3*x^4))/3 + (12005*E^(4*x^4))/8 - (16
807*E^(5*x^4))/20 + 8*x^4
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6715

```
Int[(u_)*(x_)^(m_.), x_Symbol] :> Dist[1/(m + 1), Subst[Int[SubstFor[x^(m +
 1), u, x], x], x, x^(m + 1)], x] /; FreeQ[m, x] && NeQ[m, -1] && FunctionO
fQ[x^(m + 1), u, x]
```

Rubi steps

$$\int \left(2-7e^{x^4}\right)^5 x^3\,dx = \frac{1}{4}\text{Subst}\left(\int (2-7e^x)^5\ dx, x, x^4\right)$$
$$= \frac{1}{4}\text{Subst}\left(\int \frac{(2-7x)^5}{x}\,dx, x, e^{x^4}\right)$$
$$= \frac{1}{4}\text{Subst}\left(\int \left(-560+\frac{32}{x}+3920x-13720x^2+24010x^3-16807x^4\right)dx, x, e^{x^4}\right)$$
$$= -140e^{x^4}+490e^{2x^4}-\frac{3430e^{3x^4}}{3}+\frac{12005e^{4x^4}}{8}-\frac{16807e^{5x^4}}{20}+8x^4$$

Mathematica [A] time = 0.03, size = 55, normalized size = 1.00

$$8x^4-140e^{x^4}+490e^{2x^4}-\frac{3430e^{3x^4}}{3}+\frac{12005e^{4x^4}}{8}-\frac{16807e^{5x^4}}{20}$$

Antiderivative was successfully verified.

```
[In] Integrate[(2 - 7*E^x^4)^5*x^3,x]
```

```
[Out] -140*E^x^4 + 490*E^(2*x^4) - (3430*E^(3*x^4))/3 + (12005*E^(4*x^4))/8 - (16
807*E^(5*x^4))/20 + 8*x^4
```

fricas [A] time = 0.40, size = 44, normalized size = 0.80

$$8\,x^4-\frac{16807}{20}\,e^{\left(5\,x^4\right)}+\frac{12005}{8}\,e^{\left(4\,x^4\right)}-\frac{3430}{3}\,e^{\left(3\,x^4\right)}+490\,e^{\left(2\,x^4\right)}-140\,e^{\left(x^4\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2-7*exp(x^4))^5*x^3,x, algorithm="fricas")
```

```
[Out] 8*x^4 - 16807/20*e^(5*x^4) + 12005/8*e^(4*x^4) - 3430/3*e^(3*x^4) + 490*e^(
2*x^4) - 140*e^(x^4)
```

giac [A] time = 0.22, size = 44, normalized size = 0.80

$$8\,x^4-\frac{16807}{20}\,e^{\left(5\,x^4\right)}+\frac{12005}{8}\,e^{\left(4\,x^4\right)}-\frac{3430}{3}\,e^{\left(3\,x^4\right)}+490\,e^{\left(2\,x^4\right)}-140\,e^{\left(x^4\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2-7*exp(x^4))^5*x^3,x, algorithm="giac")
```

```
[Out] 8*x^4 - 16807/20*e^(5*x^4) + 12005/8*e^(4*x^4) - 3430/3*e^(3*x^4) + 490*e^(
2*x^4) - 140*e^(x^4)
```

maple [A] time = 0.03, size = 47, normalized size = 0.85

$$-140\,\mathrm{e}^{x^4}+490\,\mathrm{e}^{2x^4}-\frac{3430\,\mathrm{e}^{3x^4}}{3}+\frac{12005\,\mathrm{e}^{4x^4}}{8}-\frac{16807\,\mathrm{e}^{5x^4}}{20}+8\ln\left(\mathrm{e}^{x^4}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((2-7*exp(x^4))^5*x^3,x)
```

```
[Out] -16807/20*exp(x^4)^5+12005/8*exp(x^4)^4-3430/3*exp(x^4)^3+490*exp(x^4)^2-14
0*exp(x^4)+8*ln(exp(x^4))
```

maxima [A] time = 0.83, size = 44, normalized size = 0.80

$$8\,x^4-\frac{16807}{20}\,e^{\left(5\,x^4\right)}+\frac{12005}{8}\,e^{\left(4\,x^4\right)}-\frac{3430}{3}\,e^{\left(3\,x^4\right)}+490\,e^{\left(2\,x^4\right)}-140\,e^{\left(x^4\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2-7*exp(x^4))^5*x^3,x, algorithm="maxima")
```

```
[Out] 8*x^4 - 16807/20*e^(5*x^4) + 12005/8*e^(4*x^4) - 3430/3*e^(3*x^4) + 490*e^(
2*x^4) - 140*e^(x^4)
```

mupad [B] time = 3.57, size = 44, normalized size = 0.80

$$490\,\mathrm{e}^{2\,x^4}-140\,\mathrm{e}^{x^4}-\frac{3430\,\mathrm{e}^{3\,x^4}}{3}+\frac{12005\,\mathrm{e}^{4\,x^4}}{8}-\frac{16807\,\mathrm{e}^{5\,x^4}}{20}+8\,x^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-x^3*(7*exp(x^4) - 2)^5,x)
```

```
[Out] 490*exp(2*x^4) - 140*exp(x^4) - (3430*exp(3*x^4))/3 + (12005*exp(4*x^4))/8
- (16807*exp(5*x^4))/20 + 8*x^4
```

sympy [A] time = 0.16, size = 49, normalized size = 0.89

$$8x^4-\frac{16807e^{5x^4}}{20}+\frac{12005e^{4x^4}}{8}-\frac{3430e^{3x^4}}{3}+490e^{2x^4}-140e^{x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2-7*exp(x**4))**5*x**3,x)
```

```
[Out] 8*x**4 - 16807*exp(5*x**4)/20 + 12005*exp(4*x**4)/8 - 3430*exp(3*x**4)/3 +
490*exp(2*x**4) - 140*exp(x**4)
```

3.713 $\int e^{x^2} \sqrt{1-e^{2x^2}}\, x \, dx$

Optimal. Leaf size=35

$$\frac{1}{4} e^{x^2} \sqrt{1-e^{2x^2}}+\frac{1}{4} \sin^{-1}\left(e^{x^2}\right)$$

```
[Out] 1/4*arcsin(exp(x^2))+1/4*exp(x^2)*(1-exp(2*x^2))^(1/2)
```

Rubi [A] time = 0.16, antiderivative size = 35, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182, Rules used = {6715, 2249, 195, 216}

$$\frac{1}{4} e^{x^2} \sqrt{1-e^{2x^2}}+\frac{1}{4} \sin^{-1}\left(e^{x^2}\right)$$

Antiderivative was successfully verified.

```
[In] Int[E^x^2*Sqrt[1 - E^(2*x^2)]*x,x]
```

```
[Out] (E^x^2*Sqrt[1 - E^(2*x^2)])/4 + ArcSin[E^x^2]/4
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rule 6715

```
Int[(u_)*(x_)^(m_.), x_Symbol] :> Dist[1/(m + 1), Subst[Int[SubstFor[x^(m +
 1), u, x], x], x, x^(m + 1)], x] /; FreeQ[m, x] && NeQ[m, -1] && FunctionO
```

```
fQ[x^(m + 1), u, x]
```

Rubi steps

$$
\begin{aligned}
\int e^{x^2}\sqrt{1-e^{2x^2}}\,x\,dx &= \frac{1}{2}\,\text{Subst}\left(\int e^x\sqrt{1-e^{2x}}\,dx,x,x^2\right)\\
&= \frac{1}{2}\,\text{Subst}\left(\int \sqrt{1-x^2}\,dx,x,e^{x^2}\right)\\
&= \frac{1}{4}e^{x^2}\sqrt{1-e^{2x^2}} + \frac{1}{4}\,\text{Subst}\left(\int \frac{1}{\sqrt{1-x^2}}\,dx,x,e^{x^2}\right)\\
&= \frac{1}{4}e^{x^2}\sqrt{1-e^{2x^2}} + \frac{1}{4}\sin^{-1}\left(e^{x^2}\right)
\end{aligned}
$$

Mathematica [A] time = 0.03, size = 32, normalized size = 0.91

$$\frac{1}{4}\left(e^{x^2}\sqrt{1-e^{2x^2}}+\sin^{-1}\left(e^{x^2}\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x^2*Sqrt[1 - E^(2*x^2)]*x,x]
[Out] (E^x^2*Sqrt[1 - E^(2*x^2)] + ArcSin[E^x^2])/4
```

fricas [A] time = 0.39, size = 43, normalized size = 1.23

$$\frac{1}{4}\sqrt{-e^{\left(2\,x^2\right)}+1}\,e^{\left(x^2\right)}-\frac{1}{2}\arctan\left(\left(\sqrt{-e^{\left(2\,x^2\right)}+1}-1\right)e^{\left(-x^2\right)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^2)*x*(1-exp(2*x^2))^(1/2),x, algorithm="fricas")
[Out] 1/4*sqrt(-e^(2*x^2) + 1)*e^(x^2) - 1/2*arctan((sqrt(-e^(2*x^2) + 1) - 1)*e^
(-x^2))
```

giac [A] time = 0.22, size = 26, normalized size = 0.74

$$\frac{1}{4}\sqrt{-e^{\left(2\,x^2\right)}+1}\,e^{\left(x^2\right)}+\frac{1}{4}\arcsin\left(e^{\left(x^2\right)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^2)*x*(1-exp(2*x^2))^(1/2),x, algorithm="giac")
```

```
[Out] 1/4*sqrt(-e^(2*x^2) + 1)*e^(x^2) + 1/4*arcsin(e^(x^2))
```

maple [A] time = 0.04, size = 27, normalized size = 0.77

$$\frac{\arcsin\left(\mathrm{e}^{x^2}\right)}{4}+\frac{\sqrt{-\mathrm{e}^{2x^2}+1}\,\mathrm{e}^{x^2}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x^2)*x*(1-exp(2*x^2))^(1/2),x)
```

```
[Out] 1/4*exp(x^2)*(1-exp(x^2)^2)^(1/2)+1/4*arcsin(exp(x^2))
```

maxima [A] time = 2.20, size = 26, normalized size = 0.74

$$\frac{1}{4}\,\sqrt{-e^{\left(2\,x^2\right)}+1}\,e^{\left(x^2\right)}+\frac{1}{4}\,\arcsin\left(e^{\left(x^2\right)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^2)*x*(1-exp(2*x^2))^(1/2),x, algorithm="maxima")
```

```
[Out] 1/4*sqrt(-e^(2*x^2) + 1)*e^(x^2) + 1/4*arcsin(e^(x^2))
```

mupad [B] time = 3.65, size = 26, normalized size = 0.74

$$\frac{\mathrm{asin}\left(\mathrm{e}^{x^2}\right)}{4}+\frac{\mathrm{e}^{x^2}\,\sqrt{1-\mathrm{e}^{2\,x^2}}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*exp(x^2)*(1 - exp(2*x^2))^(1/2),x)
```

```
[Out] asin(exp(x^2))/4 + (exp(x^2)*(1 - exp(2*x^2))^(1/2))/4
```

sympy [A] time = 59.22, size = 0, normalized size = 0.00

$$\mathrm{NaN}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x**2)*x*(1-exp(2*x**2))**(1/2),x)
```

```
[Out] nan
```

3.714 $\int e^{x^3} \left(1-e^{4x^3}\right)^2 x^2 \, dx$

Optimal. Leaf size=32

$$\frac{e^{x^3}}{3}-\frac{2e^{5x^3}}{15}+\frac{e^{9x^3}}{27}$$

```
[Out] 1/3*exp(x^3)-2/15*exp(5*x^3)+1/27*exp(9*x^3)
```

Rubi [A] time = 0.21, antiderivative size = 32, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.136, Rules used = {6715, 2249, 194}

$$\frac{e^{x^3}}{3}-\frac{2e^{5x^3}}{15}+\frac{e^{9x^3}}{27}$$

Antiderivative was successfully verified.

```
[In] Int[E^x^3*(1 - E^(4*x^3))^2*x^2,x]
```

```
[Out] E^x^3/3 - (2*E^(5*x^3))/15 + E^(9*x^3)/27
```

Rule 194

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rule 6715

```
Int[(u_)*(x_)^(m_.), x_Symbol] :> Dist[1/(m + 1), Subst[Int[SubstFor[x^(m +
 1), u, x], x], x, x^(m + 1)], x] /; FreeQ[m, x] && NeQ[m, -1] && FunctionO
fQ[x^(m + 1), u, x]
```

Rubi steps

$$\int e^{x^3}\left(1-e^{4x^3}\right)^2 x^2\,dx = \frac{1}{3}\,\text{Subst}\left(\int e^x\left(1-e^{4x}\right)^2\,dx,x,x^3\right)$$
$$= \frac{1}{3}\,\text{Subst}\left(\int \left(1-x^4\right)^2\,dx,x,e^{x^3}\right)$$
$$= \frac{1}{3}\,\text{Subst}\left(\int \left(1-2x^4+x^8\right)\,dx,x,e^{x^3}\right)$$
$$= \frac{e^{x^3}}{3}-\frac{2e^{5x^3}}{15}+\frac{e^{9x^3}}{27}$$

Mathematica [A] time = 0.02, size = 29, normalized size = 0.91

$$\frac{1}{135}e^{x^3}\left(-18e^{4x^3}+5e^{8x^3}+45\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x^3*(1 - E^(4*x^3))^2*x^2,x]
[Out] (E^x^3*(45 - 18*E^(4*x^3) + 5*E^(8*x^3)))/135
```

fricas [A] time = 0.42, size = 23, normalized size = 0.72

$$\frac{1}{27}\,e^{\left(9\,x^3\right)}-\frac{2}{15}\,e^{\left(5\,x^3\right)}+\frac{1}{3}\,e^{\left(x^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^3)*(1-exp(4*x^3))^2*x^2,x, algorithm="fricas")
[Out] 1/27*e^(9*x^3) - 2/15*e^(5*x^3) + 1/3*e^(x^3)
```

giac [A] time = 0.21, size = 23, normalized size = 0.72

$$\frac{1}{27}\,e^{\left(9\,x^3\right)}-\frac{2}{15}\,e^{\left(5\,x^3\right)}+\frac{1}{3}\,e^{\left(x^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^3)*(1-exp(4*x^3))^2*x^2,x, algorithm="giac")
[Out] 1/27*e^(9*x^3) - 2/15*e^(5*x^3) + 1/3*e^(x^3)
```

maple [A] time = 0.03, size = 24, normalized size = 0.75

$$\frac{e^{x^3}}{3}-\frac{2\,e^{5x^3}}{15}+\frac{e^{9x^3}}{27}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x^3)*(1-exp(4*x^3))^2*x^2,x)
```

```
[Out] 1/27*exp(x^3)^9-2/15*exp(x^3)^5+1/3*exp(x^3)
```

maxima [A] time = 0.81, size = 23, normalized size = 0.72

$$\frac{1}{27}\,e^{\left(9\,x^3\right)}-\frac{2}{15}\,e^{\left(5\,x^3\right)}+\frac{1}{3}\,e^{\left(x^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^3)*(1-exp(4*x^3))^2*x^2,x, algorithm="maxima")
```

```
[Out] 1/27*e^(9*x^3) - 2/15*e^(5*x^3) + 1/3*e^(x^3)
```

mupad [B] time = 3.61, size = 24, normalized size = 0.75

$$\frac{\mathrm{e}^{x^3}\,\left(5\,\mathrm{e}^{8\,x^3}-18\,\mathrm{e}^{4\,x^3}+45\right)}{135}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*exp(x^3)*(exp(4*x^3) - 1)^2,x)
```

```
[Out] (exp(x^3)*(5*exp(8*x^3) - 18*exp(4*x^3) + 45))/135
```

sympy [A] time = 0.15, size = 24, normalized size = 0.75

$$\frac{e^{9x^3}}{27}-\frac{2e^{5x^3}}{15}+\frac{e^{x^3}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x**3)*(1-exp(4*x**3))**2*x**2,x)
```

```
[Out] exp(9*x**3)/27 - 2*exp(5*x**3)/15 + exp(x**3)/3
```

3.715 $\int e^{e^x+x}\,dx$

Optimal. Leaf size=5

$$e^{e^x}$$

[Out] exp(exp(x))

Rubi [A] time = 0.01, antiderivative size = 5, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {2282, 2194}

$$e^{e^x}$$

Antiderivative was successfully verified.

[In] Int[E^(E^x + x),x]

[Out] E^E^x

Rule 2194

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] && !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] && !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}\int e^{e^x+x}\,dx &= \text{Subst}\left(\int e^x\,dx, x, e^x\right)\\ &= e^{e^x}\end{aligned}$$

Mathematica [A] time = 0.01, size = 5, normalized size = 1.00

$$e^{e^x}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(E^x + x),x]
```

```
[Out] E^E^x
```

fricas [A] time = 0.41, size = 3, normalized size = 0.60

$$e^{(e^x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x+exp(x)),x, algorithm="fricas")
```

```
[Out] e^(e^x)
```

giac [A] time = 0.20, size = 3, normalized size = 0.60

$$e^{(e^x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x+exp(x)),x, algorithm="giac")
```

```
[Out] e^(e^x)
```

maple [A] time = 0.03, size = 4, normalized size = 0.80

$$\mathrm{e}^{\mathrm{e}^{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(exp(x)+x),x)
```

```
[Out] exp(exp(x))
```

maxima [A] time = 0.94, size = 3, normalized size = 0.60

$$e^{(e^x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x+exp(x)),x, algorithm="maxima")
```

```
[Out] e^(e^x)
```

mupad [B] time = 0.03, size = 3, normalized size = 0.60

$$\mathrm{e}^{\mathrm{e}^{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x + exp(x)),x)
```

```
[Out] exp(exp(x))
```

sympy [A] time = 0.64, size = 3, normalized size = 0.60

$$e^{e^x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(exp(x)+x),x)
```

```
[Out] exp(exp(x))
```

3.716 $\int e^{e^{e^x}+e^x+x}\,dx$

Optimal. Leaf size=7

$$e^{e^{e^x}}$$

[Out] exp(exp(exp(x)))

Rubi [A] time = 0.01, antiderivative size = 7, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {2282, 2194}

$$e^{e^{e^x}}$$

Antiderivative was successfully verified.

[In] Int[E^(E^E^x + E^x + x),x]

[Out] E^E^E^x

Rule 2194

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a + b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x], Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; FunctionOfExponentialQ[u, x] && !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[{a, m, n}, x] && IntegerQ[m*n]] && !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned} \int e^{e^{e^x}+e^x+x}\,dx &= \text{Subst}\left(\int e^{e^x+x}\,dx, x, e^x\right)\\ &= \text{Subst}\left(\int e^x\,dx, x, e^{e^x}\right)\\ &= e^{e^{e^x}} \end{aligned}$$

Mathematica [A] time = 0.01, size = 7, normalized size = 1.00

$$e^{e^{e^x}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(E^E^x + E^x + x),x]
```

```
[Out] E^E^E^x
```

fricas [A] time = 0.40, size = 4, normalized size = 0.57

$$e^{\left(e^{\left(e^{x}\right)}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(exp(exp(x))+exp(x)+x),x, algorithm="fricas")
```

```
[Out] e^(e^(e^x))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int e^{\left(x+e^{x}+e^{\left(e^{x}\right)}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(exp(exp(x))+exp(x)+x),x, algorithm="giac")
```

```
[Out] integrate(e^(x + e^x + e^(e^x)), x)
```

maple [A] time = 0.03, size = 5, normalized size = 0.71

$$\mathrm{e}^{\mathrm{e}^{\mathrm{e}^{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(exp(exp(x))+exp(x)+x),x)
```

```
[Out] exp(exp(exp(x)))
```

maxima [A] time = 0.66, size = 4, normalized size = 0.57

$$e^{\left(e^{\left(e^{x}\right)}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(exp(exp(x))+exp(x)+x),x, algorithm="maxima")
```

```
[Out] e^(e^(e^x))
```

mupad [B] time = 3.46, size = 4, normalized size = 0.57

$$\mathrm{e}^{\mathrm{e}^{\mathrm{e}^x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x + exp(exp(x)) + exp(x)),x)
```

```
[Out] exp(exp(exp(x)))
```

sympy [A] time = 0.92, size = 5, normalized size = 0.71

$$e^{e^{e^x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(exp(exp(x))+exp(x)+x),x)
```

```
[Out] exp(exp(exp(x)))
```

3.717 $\int (e^{-x}+e^x)^2 \, dx$

Optimal. Leaf size=22

$$2x-\frac{e^{-2x}}{2}+\frac{e^{2x}}{2}$$

[Out] -1/2/exp(2*x)+1/2*exp(2*x)+2*x

Rubi [A] time = 0.02, antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {2282, 266, 43}

$$2x-\frac{e^{-2x}}{2}+\frac{e^{2x}}{2}$$

Antiderivative was successfully verified.

[In] Int[(E^(-x) + E^x)^2,x]

[Out] -1/(2*E^(2*x)) + E^(2*x)/2 + 2*x

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\int (e^{-x}+e^x)^2\,dx = \text{Subst}\left(\int \frac{\left(1+x^2\right)^2}{x^3}\,dx, x, e^x\right)$$
$$= \frac{1}{2}\,\text{Subst}\left(\int \frac{(1+x)^2}{x^2}\,dx, x, e^{2x}\right)$$
$$= \frac{1}{2}\,\text{Subst}\left(\int \left(1+\frac{1}{x^2}+\frac{2}{x}\right)\,dx, x, e^{2x}\right)$$
$$= -\frac{1}{2}e^{-2x}+\frac{e^{2x}}{2}+2x$$

Mathematica [A] time = 0.01, size = 20, normalized size = 0.91

$$\frac{1}{2}\left(4x-e^{-2x}+e^{2x}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^(-x) + E^x)^2,x]
[Out] (-E^(-2*x) + E^(2*x) + 4*x)/2
```

fricas [A] time = 0.40, size = 19, normalized size = 0.86

$$\frac{1}{2}\left(4\,xe^{(2\,x)}+e^{(4\,x)}-1\right)e^{(-2\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(-x)+exp(x))^2,x, algorithm="fricas")
[Out] 1/2*(4*x*e^(2*x) + e^(4*x) - 1)*e^(-2*x)
```

giac [A] time = 0.20, size = 24, normalized size = 1.09

$$-\frac{1}{2}\left(2\,e^{(2\,x)}+1\right)e^{(-2\,x)}+2\,x+\frac{1}{2}\,e^{(2\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(-x)+exp(x))^2,x, algorithm="giac")
[Out] -1/2*(2*e^(2*x) + 1)*e^(-2*x) + 2*x + 1/2*e^(2*x)
```

maple [A] time = 0.03, size = 17, normalized size = 0.77

$$2x - \frac{e^{-2x}}{2} + \frac{e^{2x}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(-x)+exp(x))^2,x)
```

```
[Out] 2*x-1/2/exp(x)^2+1/2*exp(x)^2
```

maxima [A] time = 0.74, size = 16, normalized size = 0.73

$$2\,x + \frac{1}{2}\,e^{(2\,x)} - \frac{1}{2}\,e^{(-2\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(-x)+exp(x))^2,x, algorithm="maxima")
```

```
[Out] 2*x + 1/2*e^(2*x) - 1/2*e^(-2*x)
```

mupad [B] time = 3.58, size = 8, normalized size = 0.36

$$2\,x + \sinh\left(2\,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(-x) + exp(x))^2,x)
```

```
[Out] 2*x + sinh(2*x)
```

sympy [A] time = 0.11, size = 17, normalized size = 0.77

$$2x + \frac{e^{2x}}{2} - \frac{e^{-2x}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((exp(-x)+exp(x))**2,x)
```

```
[Out] 2*x + exp(2*x)/2 - exp(-2*x)/2
```

3.718 $\int \frac{1}{e^{-x}+e^x} dx$

Optimal. Leaf size=4

$$\tan^{-1}(e^x)$$

```
[Out] arctan(exp(x))
```

Rubi [A] time = 0.01, antiderivative size = 4, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182, Rules used = {2282, 203}

$$\tan^{-1}(e^x)$$

Antiderivative was successfully verified.

```
[In] Int[(E^(-x) + E^x)^(-1),x]
```

```
[Out] ArcTan[E^x]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}\int \frac{1}{e^{-x}+e^x} dx &= \text{Subst}\left(\int \frac{1}{1+x^2} dx, x, e^x\right)\\ &= \tan^{-1}(e^x)\end{aligned}$$

Mathematica [A] time = 0.00, size = 4, normalized size = 1.00

$$\tan^{-1}(e^x)$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^(-x) + E^x)^(-1),x]
```

```
[Out] ArcTan[E^x]
```

fricas [A] time = 0.39, size = 3, normalized size = 0.75

$$\arctan\left(e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(exp(-x)+exp(x)),x, algorithm="fricas")
```

```
[Out] arctan(e^x)
```

giac [A] time = 0.20, size = 3, normalized size = 0.75

$$\arctan\left(e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(exp(-x)+exp(x)),x, algorithm="giac")
```

```
[Out] arctan(e^x)
```

maple [A] time = 0.03, size = 4, normalized size = 1.00

$$\arctan\left(\mathrm{e}^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(exp(-x)+exp(x)),x)
```

```
[Out] arctan(exp(x))
```

maxima [B] time = 2.16, size = 7, normalized size = 1.75

$$-\arctan\left(e^{(-x)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(exp(-x)+exp(x)),x, algorithm="maxima")
```

```
[Out] -arctan(e^(-x))
```

mupad [B] time = 0.02, size = 3, normalized size = 0.75

$$\mathrm{atan}\left(\mathrm{e}^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(exp(-x) + exp(x)),x)
```

```
[Out] atan(exp(x))
```

sympy [B] time = 0.11, size = 15, normalized size = 3.75

$$\mathrm{RootSum}\left(4z^2+1,\left(i\mapsto i\log\left(2i+e^x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(exp(-x)+exp(x)),x)
```

```
[Out] RootSum(4*_z**2 + 1, Lambda(_i, _i*log(2*_i + exp(x))))
```

3.719 $\int \frac{1}{(e^{-x}+e^x)^2} dx$

Optimal. Leaf size=13

$$-\frac{1}{2\left(e^{2x}+1\right)}$$

```
[Out] -1/2/(1+exp(2*x))
```

Rubi [A] time = 0.01, antiderivative size = 13, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182, Rules used = {2282, 261}

$$-\frac{1}{2\left(e^{2x}+1\right)}$$

Antiderivative was successfully verified.

```
[In] Int[(E^(-x) + E^x)^(-2),x]
```

```
[Out] -1/(2*(1 + E^(2*x)))
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}\int \frac{1}{(e^{-x}+e^x)^2} dx &= \text{Subst}\left(\int \frac{x}{\left(1+x^2\right)^2} dx, x, e^x\right)\\ &= -\frac{1}{2\left(1+e^{2x}\right)}\end{aligned}$$

Mathematica [A] time = 0.01, size = 13, normalized size = 1.00

$$-\frac{1}{2e^{2x}+2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^(-x) + E^x)^(-2),x]
[Out] -(2 + 2*E^(2*x))^(-1)
```

fricas [A] time = 0.38, size = 10, normalized size = 0.77

$$-\frac{1}{2\left(e^{(2x)}+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(exp(-x)+exp(x))^2,x, algorithm="fricas")
[Out] -1/2/(e^(2*x) + 1)
```

giac [A] time = 0.20, size = 10, normalized size = 0.77

$$-\frac{1}{2\left(e^{(2x)}+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(exp(-x)+exp(x))^2,x, algorithm="giac")
[Out] -1/2/(e^(2*x) + 1)
```

maple [A] time = 0.03, size = 11, normalized size = 0.85

$$-\frac{1}{2\left(e^{2x}+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(exp(-x)+exp(x))^2,x)
[Out] -1/2/(1+exp(x)^2)
```

maxima [A] time = 0.87, size = 10, normalized size = 0.77

$$\frac{1}{2\left(e^{(-2x)}+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(exp(-x)+exp(x))^2,x, algorithm="maxima")
```

```
[Out] 1/2/(e^(-2*x) + 1)
```

mupad [B] time = 0.07, size = 12, normalized size = 0.92

$$-\frac{1}{2\left(\mathrm{e}^{2x}+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(exp(-x) + exp(x))^2,x)
```

```
[Out] -1/(2*(exp(2*x) + 1))
```

sympy [A] time = 0.08, size = 10, normalized size = 0.77

$$-\frac{1}{2e^{2x}+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(exp(-x)+exp(x))**2,x)
```

```
[Out] -1/(2*exp(2*x) + 2)
```

3.720 $\int \frac{1}{-e^{-x}+e^x} dx$

Optimal. Leaf size=6

$$-\tanh^{-1}(e^x)$$

```
[Out] -arctanh(exp(x))
```

Rubi [A] time = 0.01, antiderivative size = 6, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2282, 207}

$$-\tanh^{-1}(e^x)$$

Antiderivative was successfully verified.

```
[In] Int[(-E^(-x) + E^x)^(-1),x]
```

```
[Out] -ArcTanh[E^x]
```

Rule 207

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTanh[(Rt[b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (LtQ[a
, 0] || GtQ[b, 0])
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}\int \frac{1}{-e^{-x}+e^x} dx &= \text{Subst}\left(\int \frac{1}{-1+x^2} dx, x, e^x\right)\\ &= -\tanh^{-1}(e^x)\end{aligned}$$

Mathematica [A] time = 0.00, size = 6, normalized size = 1.00

$$-\tanh^{-1}(e^x)$$

Antiderivative was successfully verified.

```
[In] Integrate[(-E^(-x) + E^x)^(-1),x]
```

```
[Out] -ArcTanh[E^x]
```

fricas [B] time = 0.41, size = 15, normalized size = 2.50

$$-\frac{1}{2}\log\left(e^{x}+1\right)+\frac{1}{2}\log\left(e^{x}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-1/exp(x)+exp(x)),x, algorithm="fricas")
```

```
[Out] -1/2*log(e^x + 1) + 1/2*log(e^x - 1)
```

giac [B] time = 0.19, size = 16, normalized size = 2.67

$$-\frac{1}{2}\log\left(e^{x}+1\right)+\frac{1}{2}\log\left(|e^{x}-1|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-1/exp(x)+exp(x)),x, algorithm="giac")
```

```
[Out] -1/2*log(e^x + 1) + 1/2*log(abs(e^x - 1))
```

maple [A] time = 0.02, size = 6, normalized size = 1.00

$$-\operatorname{arctanh}\left(e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-1/exp(x)+exp(x)),x)
```

```
[Out] -arctanh(exp(x))
```

maxima [B] time = 0.96, size = 19, normalized size = 3.17

$$-\frac{1}{2}\log\left(e^{(-x)}+1\right)+\frac{1}{2}\log\left(e^{(-x)}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-1/exp(x)+exp(x)),x, algorithm="maxima")
```

```
[Out] -1/2*log(e^(-x) + 1) + 1/2*log(e^(-x) - 1)
```

mupad [B] time = 0.05, size = 15, normalized size = 2.50

$$\frac{\ln\left(\mathrm{e}^x-1\right)}{2}-\frac{\ln\left(\mathrm{e}^x+1\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-1/(exp(-x) - exp(x)),x)
[Out] log(exp(x) - 1)/2 - log(exp(x) + 1)/2
```

sympy [B] time = 0.10, size = 15, normalized size = 2.50

$$\frac{\log\left(e^x-1\right)}{2}-\frac{\log\left(e^x+1\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-1/exp(x)+exp(x)),x)
[Out] log(exp(x) - 1)/2 - log(exp(x) + 1)/2
```

3.721 $\int \frac{1}{(-e^{-x}+e^x)^2} dx$

Optimal. Leaf size=15

$$\frac{1}{2(1-e^{2x})}$$

```
[Out] 1/2/(1-exp(2*x))
```

Rubi [A] time = 0.01, antiderivative size = 15, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2282, 261}

$$\frac{1}{2(1-e^{2x})}$$

Antiderivative was successfully verified.

```
[In] Int[(-E^(-x) + E^x)^(-2),x]
```

```
[Out] 1/(2*(1 - E^(2*x)))
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned} \int \frac{1}{(-e^{-x}+e^x)^2} dx &= \text{Subst}\left(\int \frac{x}{(1-x^2)^2} dx, x, e^x\right) \\ &= \frac{1}{2(1-e^{2x})} \end{aligned}$$

Mathematica [A] time = 0.02, size = 11, normalized size = 0.73

$$\frac{1}{2-2e^{2x}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(-E^(-x) + E^x)^(-2),x]
[Out] (2 - 2*E^(2*x))^(-1)
```

fricas [A] time = 0.40, size = 10, normalized size = 0.67

$$-\frac{1}{2\left(e^{(2x)}-1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-1/exp(x)+exp(x))^2,x, algorithm="fricas")
[Out] -1/2/(e^(2*x) - 1)
```

giac [A] time = 0.20, size = 10, normalized size = 0.67

$$-\frac{1}{2\left(e^{(2x)}-1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-1/exp(x)+exp(x))^2,x, algorithm="giac")
[Out] -1/2/(e^(2*x) - 1)
```

maple [A] time = 0.02, size = 11, normalized size = 0.73

$$-\frac{1}{2\left(\mathrm{e}^{2x}-1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-1/exp(x)+exp(x))^2,x)
[Out] -1/2/(exp(x)^2-1)
```

maxima [A] time = 1.00, size = 10, normalized size = 0.67

$$\frac{1}{2\left(e^{(-2x)}-1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-1/exp(x)+exp(x))^2,x, algorithm="maxima")
```

```
[Out] 1/2/(e^(-2*x) - 1)
```

mupad [B] time = 3.40, size = 12, normalized size = 0.80

$$-\frac{1}{2\left(e^{2x}-1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(exp(-x) - exp(x))^2,x)
```

```
[Out] -1/(2*(exp(2*x) - 1))
```

sympy [A] time = 0.08, size = 10, normalized size = 0.67

$$-\frac{1}{2e^{2x}-2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-1/exp(x)+exp(x))**2,x)
```

```
[Out] -1/(2*exp(2*x) - 2)
```

3.722 $\int e^x \left(-e^{-x}+e^x\right)^2 \, dx$

Optimal. Leaf size=22

$$-e^{-x}-2e^x+\frac{e^{3x}}{3}$$

[Out] -1/exp(x)-2*exp(x)+1/3*exp(3*x)

Rubi [A] time = 0.03, antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118, Rules used = {2282, 14}

$$-e^{-x}-2e^x+\frac{e^{3x}}{3}$$

Antiderivative was successfully verified.

[In] Int[E^x*(-E^(-x) + E^x)^2,x]

[Out] -E^(-x) - 2*E^x + E^(3*x)/3

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}
\int e^x \left(-e^{-x}+e^x\right)^2 \, dx &= \text{Subst}\left(\int \frac{\frac{1}{x}-2x+x^3}{x} \, dx, x, e^x\right)\\
&= \text{Subst}\left(\int \left(-2+\frac{1}{x^2}+x^2\right) \, dx, x, e^x\right)\\
&= -e^{-x}-2e^x+\frac{e^{3x}}{3}
\end{aligned}$$

Mathematica [**A**] time = 0.01, size = 22, normalized size = 1.00

$$-e^{-x}-2e^{x}+\frac{e^{3x}}{3}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x*(-E^(-x) + E^x)^2,x]
[Out] -E^(-x) - 2*E^x + E^(3*x)/3
```

fricas [**A**] time = 0.39, size = 18, normalized size = 0.82

$$\frac{1}{3}\left(e^{(4x)}-6e^{(2x)}-3\right)e^{(-x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(-1/exp(x)+exp(x))^2,x, algorithm="fricas")
[Out] 1/3*(e^(4*x) - 6*e^(2*x) - 3)*e^(-x)
```

giac [**A**] time = 0.21, size = 17, normalized size = 0.77

$$\frac{1}{3}e^{(3x)}-e^{(-x)}-2e^{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(-1/exp(x)+exp(x))^2,x, algorithm="giac")
[Out] 1/3*e^(3*x) - e^(-x) - 2*e^x
```

maple [**A**] time = 0.03, size = 18, normalized size = 0.82

$$-2\,\mathrm{e}^{x}-\mathrm{e}^{-x}+\frac{\mathrm{e}^{3x}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*(-1/exp(x)+exp(x))^2,x)
[Out] 1/3*exp(x)^3-2*exp(x)-1/exp(x)
```

maxima [**A**] time = 0.48, size = 21, normalized size = 0.95

$$-\frac{1}{3}\left(6e^{(-2x)}-1\right)e^{(3x)}-e^{(-x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(-1/exp(x)+exp(x))^2,x, algorithm="maxima")
```

```
[Out] -1/3*(6*e^(-2*x) - 1)*e^(3*x) - e^(-x)
```

mupad [B] time = 0.06, size = 17, normalized size = 0.77

$$\frac{e^{3x}}{3} - e^{-x} - 2e^{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*(exp(-x) - exp(x))^2,x)
```

```
[Out] exp(3*x)/3 - exp(-x) - 2*exp(x)
```

sympy [A] time = 0.11, size = 15, normalized size = 0.68

$$\frac{e^{3x}}{3} - 2e^{x} - e^{-x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(-1/exp(x)+exp(x))**2,x)
```

```
[Out] exp(3*x)/3 - 2*exp(x) - exp(-x)
```

3.723 $\int e^x(-e^{-x}+e^x)^3\,dx$

Optimal. Leaf size=31

$$3x+\frac{e^{-2x}}{2}-\frac{3e^{2x}}{2}+\frac{e^{4x}}{4}$$

```
[Out] 1/2/exp(2*x)-3/2*exp(2*x)+1/4*exp(4*x)+3*x
```

Rubi [A] time = 0.04, antiderivative size = 31, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.176, Rules used = {2282, 266, 43}

$$3x+\frac{e^{-2x}}{2}-\frac{3e^{2x}}{2}+\frac{e^{4x}}{4}$$

Antiderivative was successfully verified.

```
[In] Int[E^x*(-E^(-x) + E^x)^3,x]
```

```
[Out] 1/(2*E^(2*x)) - (3*E^(2*x))/2 + E^(4*x)/4 + 3*x
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\int e^x(-e^{-x}+e^x)^3\,dx = \text{Subst}\left(\int \frac{(-1+x^2)^3}{x^3}\,dx, x, e^x\right)$$
$$= \frac{1}{2}\text{Subst}\left(\int \frac{(-1+x)^3}{x^2}\,dx, x, e^{2x}\right)$$
$$= \frac{1}{2}\text{Subst}\left(\int \left(-3-\frac{1}{x^2}+\frac{3}{x}+x\right)dx, x, e^{2x}\right)$$
$$= \frac{e^{-2x}}{2}-\frac{3e^{2x}}{2}+\frac{e^{4x}}{4}+3x$$

Mathematica [A] time = 0.01, size = 29, normalized size = 0.94

$$\frac{1}{2}\left(6x+e^{-2x}-3e^{2x}+\frac{e^{4x}}{2}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x*(-E^(-x) + E^x)^3,x]
[Out] (E^(-2*x) - 3*E^(2*x) + E^(4*x)/2 + 6*x)/2
```

fricas [A] time = 0.41, size = 25, normalized size = 0.81

$$\frac{1}{4}\left(12\,xe^{(2\,x)}+e^{(6\,x)}-6\,e^{(4\,x)}+2\right)e^{(-2\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(-1/exp(x)+exp(x))^3,x, algorithm="fricas")
[Out] 1/4*(12*x*e^(2*x) + e^(6*x) - 6*e^(4*x) + 2)*e^(-2*x)
```

giac [A] time = 0.21, size = 30, normalized size = 0.97

$$-\frac{1}{2}\left(3\,e^{(2\,x)}-1\right)e^{(-2\,x)}+3\,x+\frac{1}{4}\,e^{(4\,x)}-\frac{3}{2}\,e^{(2\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(-1/exp(x)+exp(x))^3,x, algorithm="giac")
[Out] -1/2*(3*e^(2*x) - 1)*e^(-2*x) + 3*x + 1/4*e^(4*x) - 3/2*e^(2*x)
```

maple [A] time = 0.03, size = 25, normalized size = 0.81

$$\frac{e^{-2x}}{2}-\frac{3\,e^{2x}}{2}+\frac{e^{4x}}{4}+3\ln\left(e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*(-1/exp(x)+exp(x))^3,x)
```

```
[Out] 1/4*exp(x)^4-3/2*exp(x)^2+1/2/exp(x)^2+3*ln(exp(x))
```

maxima [A] time = 0.89, size = 24, normalized size = 0.77

$$-\frac{1}{4}\left(6\,e^{(-2\,x)}-1\right)e^{(4\,x)}+3\,x+\frac{1}{2}\,e^{(-2\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(-1/exp(x)+exp(x))^3,x, algorithm="maxima")
```

```
[Out] -1/4*(6*e^(-2*x) - 1)*e^(4*x) + 3*x + 1/2*e^(-2*x)
```

mupad [B] time = 3.59, size = 22, normalized size = 0.71

$$3\,x+\frac{e^{-2\,x}}{2}-\frac{3\,e^{2\,x}}{2}+\frac{e^{4\,x}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-exp(x)*(exp(-x) - exp(x))^3,x)
```

```
[Out] 3*x + exp(-2*x)/2 - (3*exp(2*x))/2 + exp(4*x)/4
```

sympy [A] time = 0.14, size = 26, normalized size = 0.84

$$3x+\frac{e^{4x}}{4}-\frac{3e^{2x}}{2}+\frac{e^{-2x}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(-1/exp(x)+exp(x))**3,x)
```

```
[Out] 3*x + exp(4*x)/4 - 3*exp(2*x)/2 + exp(-2*x)/2
```

3.724 $\int \frac{1+4^x}{1+2^x} dx$

Optimal. Leaf size=22

$$x - \frac{2\log(2^x+1)}{\log(2)} + \frac{2^x}{\log(2)}$$

```
[Out] x+2^x/ln(2)-2*ln(1+2^x)/ln(2)
```

Rubi [A] time = 0.03, antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {2282, 894}

$$x - \frac{2\log(2^x+1)}{\log(2)} + \frac{2^x}{\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[(1 + 4^x)/(1 + 2^x),x]
```

```
[Out] x + 2^x/Log[2] - (2*Log[1 + 2^x])/Log[2]
```

Rule 894

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_) + (c_.)*(x_)^
2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f + g*x)^n*(a + c*x
^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ[c
*d^2 + a*e^2, 0] && IntegerQ[p] && ((EqQ[p, 1] && IntegersQ[m, n]) || (ILtQ
[m, 0] && ILtQ[n, 0]))
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] && !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] && !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\int \frac{1+4^x}{1+2^x}\,dx = \frac{\text{Subst}\left(\int \frac{1+x^2}{x(1+x)}\,dx, x, 2^x\right)}{\log(2)}$$
$$= \frac{\text{Subst}\left(\int \left(1+\frac{1}{x}-\frac{2}{1+x}\right)dx, x, 2^x\right)}{\log(2)}$$
$$= x + \frac{2^x}{\log(2)} - \frac{2\log(1+2^x)}{\log(2)}$$

Mathematica [**A**] time = 0.01, size = 21, normalized size = 0.95

$$\frac{2^x + x\log(2) - 2\log(2^x+1)}{\log(2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(1 + 4^x)/(1 + 2^x),x]
[Out] (2^x + x*Log[2] - 2*Log[1 + 2^x])/Log[2]
```

fricas [**A**] time = 0.42, size = 21, normalized size = 0.95

$$\frac{x\log(2) + 2^x - 2\log(2^x+1)}{\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+4^x)/(1+2^x),x, algorithm="fricas")
[Out] (x*log(2) + 2^x - 2*log(2^x + 1))/log(2)
```

giac [**F**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{4^x+1}{2^x+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+4^x)/(1+2^x),x, algorithm="giac")
[Out] integrate((4^x + 1)/(2^x + 1), x)
```

maple [**A**] time = 0.09, size = 27, normalized size = 1.23

$$x + \frac{e^{\ln(2)x}}{\ln(2)} - \frac{2\ln\left(e^{\ln(2)x}+1\right)}{\ln(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((1+4^x)/(1+2^x),x)
```

```
[Out] x+1/ln(2)*exp(ln(2)*x)-2/ln(2)*ln(1+exp(ln(2)*x))
```

maxima [A] time = 1.91, size = 22, normalized size = 1.00

$$x + \frac{2^x}{\log(2)} - \frac{2 \log(2^x + 1)}{\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+4^x)/(1+2^x),x, algorithm="maxima")
```

```
[Out] x + 2^x/log(2) - 2*log(2^x + 1)/log(2)
```

mupad [B] time = 3.48, size = 21, normalized size = 0.95

$$\frac{x \ln(2) - 2 \ln(2^x + 1) + 2^x}{\ln(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((4^x + 1)/(2^x + 1),x)
```

```
[Out] (x*log(2) - 2*log(2^x + 1) + 2^x)/log(2)
```

sympy [A] time = 0.26, size = 29, normalized size = 1.32

$$x + \frac{e^{\frac{x \log(4)}{2}}}{\log(2)} - \frac{2 \log\left(e^{\frac{x \log(4)}{2}} + 1\right)}{\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+4**x)/(1+2**x),x)
```

```
[Out] x + exp(x*log(4)/2)/log(2) - 2*log(exp(x*log(4)/2) + 1)/log(2)
```

3.725 $\int \frac{1+4^x}{1+2^{-x}} \, dx$

Optimal. Leaf size=34

$$\frac{2\log(2^x+1)}{\log(2)} - \frac{2^x}{\log(2)} + \frac{2^{2x-1}}{\log(2)}$$

```
[Out] -2^x/ln(2)+2^(-1+2*x)/ln(2)+2*ln(1+2^x)/ln(2)
```

Rubi [A] time = 0.03, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {2282, 697}

$$\frac{2\log(2^x+1)}{\log(2)} - \frac{2^x}{\log(2)} + \frac{2^{2x-1}}{\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[(1 + 4^x)/(1 + 2^(-x)),x]
```

```
[Out] -(2^x/Log[2]) + 2^(-1 + 2*x)/Log[2] + (2*Log[1 + 2^x])/Log[2]
```

Rule 697

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[
ExpandIntegrand[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, m},
 x] && NeQ[c*d^2 + a*e^2, 0] && IGtQ[p, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\int \frac{1+4^x}{1+2^{-x}}\,dx = \frac{\text{Subst}\left(\int \frac{1+x^2}{1+x}\,dx, x, 2^x\right)}{\log(2)}$$
$$= \frac{\text{Subst}\left(\int \left(-1+x+\frac{2}{1+x}\right)dx, x, 2^x\right)}{\log(2)}$$
$$= -\frac{2^x}{\log(2)} + \frac{2^{-1+2x}}{\log(2)} + \frac{2\log\left(1+2^x\right)}{\log(2)}$$

Mathematica [A] time = 0.03, size = 23, normalized size = 0.68

$$\frac{2^x\left(2^x-2\right)+4\log\left(2^x+1\right)}{\log(4)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(1 + 4^x)/(1 + 2^(-x)),x]
[Out] (2^x*(-2 + 2^x) + 4*Log[1 + 2^x])/Log[4]
```

fricas [A] time = 0.40, size = 25, normalized size = 0.74

$$\frac{2^{2\,x}-2\cdot 2^x+4\,\log\left(2^x+1\right)}{2\,\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+4^x)/(1+1/(2^x)),x, algorithm="fricas")
[Out] 1/2*(2^(2*x) - 2*2^x + 4*log(2^x + 1))/log(2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{4^x+1}{\frac{1}{2^x}+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+4^x)/(1+1/(2^x)),x, algorithm="giac")
[Out] integrate((4^x + 1)/(1/2^x + 1), x)
```

maple [A] time = 0.09, size = 40, normalized size = 1.18

$$-\frac{e^{\ln(2)x}}{\ln(2)}+\frac{e^{2\ln(2)x}}{2\ln(2)}+\frac{2\ln\left(e^{\ln(2)x}+1\right)}{\ln(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((1+4^x)/(1+1/(2^x)),x)
```

```
[Out] -1/ln(2)*exp(ln(2)*x)+1/2/ln(2)*exp(ln(2)*x)^2+2/ln(2)*ln(exp(ln(2)*x)+1)
```

maxima [A] time = 2.14, size = 40, normalized size = 1.18

$$2\,x-\frac{2^{2\,x-1}\left(2^{-x+1}-1\right)}{\log(2)}+\frac{2\,\log\left(\frac{1}{2^x}+1\right)}{\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+4^x)/(1+1/(2^x)),x, algorithm="maxima")
```

```
[Out] 2*x - 2^(2*x - 1)*(2^(-x + 1) - 1)/log(2) + 2*log(1/2^x + 1)/log(2)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.03

$$\int\frac{4^x+1}{\frac{1}{2^x}+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((4^x + 1)/(1/2^x + 1),x)
```

```
[Out] int((4^x + 1)/(1/2^x + 1), x)
```

sympy [A] time = 0.30, size = 39, normalized size = 1.15

$$2x+\frac{2^{2x}\log(2)-2\cdot 2^x\log(2)}{2\log(2)^2}+\frac{2\log(1+2^{-x})}{\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+4**x)/(1+1/(2**x)),x)
```

```
[Out] 2*x + (2**(2*x)*log(2) - 2*2**x*log(2))/(2*log(2)**2) + 2*log(1 + 2**(-x))/
log(2)
```

3.726 $\int \left(\frac{e^{(a+x)^2}}{x^2} - \frac{2ae^{(a+x)^2}}{x}\right) dx$

Optimal. Leaf size=23

$$\sqrt{\pi}\,\mathrm{erfi}(a+x) - \frac{e^{(a+x)^2}}{x}$$

```
[Out] -exp((a+x)^2)/x+erfi(a+x)*Pi^(1/2)
```

Rubi [A] time = 0.05, antiderivative size = 23, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.080, Rules used = {2220, 2204}

$$\sqrt{\pi}\,\mathrm{Erfi}(a+x) - \frac{e^{(a+x)^2}}{x}$$

Antiderivative was successfully verified.

```
[In] Int[E^(a + x)^2/x^2 - (2*a*E^(a + x)^2)/x,x]
```

```
[Out] -(E^(a + x)^2/x) + Sqrt[Pi]*Erfi[a + x]
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2220

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2)*((e_.) + (f_.)*(x_))^(m_),
x_Symbol] :> Simp[(f*(e + f*x)^(m + 1)*F^(a + b*(c + d*x)^2))/((m + 1)*f^2)
, x] + (-Dist[(2*b*d^2*Log[F])/(f^2*(m + 1)), Int[(e + f*x)^(m + 2)*F^(a +
b*(c + d*x)^2), x], x] + Dist[(2*b*d*(d*e - c*f)*Log[F])/(f^2*(m + 1)), Int
[(e + f*x)^(m + 1)*F^(a + b*(c + d*x)^2), x], x]) /; FreeQ[{F, a, b, c, d,
e, f}, x] && NeQ[d*e - c*f, 0] && LtQ[m, -1]
```

Rubi steps

$$\int \left(\frac{e^{(a+x)^2}}{x^2} - \frac{2ae^{(a+x)^2}}{x}\right) dx = -\left((2a)\int \frac{e^{(a+x)^2}}{x}\, dx\right) + \int \frac{e^{(a+x)^2}}{x^2}\, dx$$
$$= -\frac{e^{(a+x)^2}}{x} + 2\int e^{(a+x)^2}\, dx$$
$$= -\frac{e^{(a+x)^2}}{x} + \sqrt{\pi}\,\text{erfi}(a+x)$$

Mathematica [A] time = 0.09, size = 23, normalized size = 1.00

$$\sqrt{\pi}\,\text{erfi}(a+x) - \frac{e^{(a+x)^2}}{x}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a + x)^2/x^2 - (2*a*E^(a + x)^2)/x,x]
[Out] -(E^(a + x)^2/x) + Sqrt[Pi]*Erfi[a + x]
```

fricas [A] time = 0.41, size = 28, normalized size = 1.22

$$\frac{\sqrt{\pi}\,x\,\text{erfi}\,(a+x) - e^{\left(a^2+2\,ax+x^2\right)}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((a+x)^2)/x^2-2*a*exp((a+x)^2)/x,x, algorithm="fricas")
[Out] (sqrt(pi)*x*erfi(a + x) - e^(a^2 + 2*a*x + x^2))/x
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int -\frac{2\,ae^{\left((a+x)^2\right)}}{x} + \frac{e^{\left((a+x)^2\right)}}{x^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((a+x)^2)/x^2-2*a*exp((a+x)^2)/x,x, algorithm="giac")
[Out] integrate(-2*a*e^((a + x)^2)/x + e^((a + x)^2)/x^2, x)
```

maple [F] time = 0.17, size = 0, normalized size = 0.00

$$\int -\frac{2a\,\mathrm{e}^{(a+x)^2}}{x} + \frac{\mathrm{e}^{(a+x)^2}}{x^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(exp((a+x)^2)/x^2-2*a*exp((a+x)^2)/x,x)

[Out] int(exp((a+x)^2)/x^2-2*a*exp((a+x)^2)/x,x)

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int -\frac{2\,ae^{\left((a+x)^2\right)}}{x} + \frac{e^{\left((a+x)^2\right)}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(exp((a+x)^2)/x^2-2*a*exp((a+x)^2)/x,x, algorithm="maxima")

[Out] integrate(-2*a*e^((a + x)^2)/x + e^((a + x)^2)/x^2, x)

mupad [B] time = 3.41, size = 27, normalized size = 1.17

$$\sqrt{\pi}\ \mathrm{erfi}\left(a+x\right)-\frac{\mathrm{e}^{a^2}\,\mathrm{e}^{x^2}\,\mathrm{e}^{2\,a\,x}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(exp((a + x)^2)/x^2 - (2*a*exp((a + x)^2))/x,x)

[Out] pi^(1/2)*erfi(a + x) - (exp(a^2)*exp(x^2)*exp(2*a*x))/x

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\left(\int\left(-\frac{e^{x^2}e^{2ax}}{x^2}\right)dx + \int\frac{2ae^{x^2}e^{2ax}}{x}\,dx\right)e^{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(exp((a+x)**2)/x**2-2*a*exp((a+x)**2)/x,x)

[Out] -(Integral(-exp(x**2)*exp(2*a*x)/x**2, x) + Integral(2*a*exp(x**2)*exp(2*a*
x)/x, x))*exp(a**2)

3.727 $\int e^{-x^2}\left(x^4+x^6+x^8\right)dx$

Optimal. Leaf size=66

$$\frac{147}{32}\sqrt{\pi}\,\mathrm{erf}(x)-\frac{147}{16}e^{-x^2}x-\frac{1}{2}e^{-x^2}x^7-\frac{9}{4}e^{-x^2}x^5-\frac{49}{8}e^{-x^2}x^3$$

```
[Out] -147/16*x/exp(x^2)-49/8*x^3/exp(x^2)-9/4*x^5/exp(x^2)-1/2*x^7/exp(x^2)+147/
32*erf(x)*Pi^(1/2)
```

Rubi [A] time = 0.18, antiderivative size = 66, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 4, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {1594, 2226, 2212, 2205}

$$\frac{147}{32}\sqrt{\pi}\,\mathrm{Erf}(x)-\frac{1}{2}e^{-x^2}x^7-\frac{9}{4}e^{-x^2}x^5-\frac{49}{8}e^{-x^2}x^3-\frac{147}{16}e^{-x^2}x$$

Antiderivative was successfully verified.

```
[In] Int[(x^4 + x^6 + x^8)/E^x^2,x]
```

```
[Out] (-147*x)/(16*E^x^2) - (49*x^3)/(8*E^x^2) - (9*x^5)/(4*E^x^2) - x^7/(2*E^x^2
) + (147*Sqrt[Pi]*Erf[x])/32
```

Rule 1594

```
Int[(u_.)*((a_.)*(x_)^(p_.) + (b_.)*(x_)^(q_.) + (c_.)*(x_)^(r_.))^(n_.), x
_Symbol] :> Int[u*x^(n*p)*(a + b*x^(q - p) + c*x^(r - p))^n, x] /; FreeQ[{a
, b, c, p, q, r}, x] && IntegerQ[n] && PosQ[q - p] && PosQ[r - p]
```

Rule 2205

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erf[(c + d*x)*Rt[-(b*Log[F]), 2]])/(2*d*Rt[-(b*Log[F]), 2]), x] /; Fr
eeQ[{F, a, b, c, d}, x] && NegQ[b]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rule 2226

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\begin{aligned}
\int e^{-x^2}\left(x^4+x^6+x^8\right)dx &= \int e^{-x^2}x^4\left(1+x^2+x^4\right)dx\\
&= \int \left(e^{-x^2}x^4+e^{-x^2}x^6+e^{-x^2}x^8\right)dx\\
&= \int e^{-x^2}x^4\,dx+\int e^{-x^2}x^6\,dx+\int e^{-x^2}x^8\,dx\\
&= -\frac{1}{2}e^{-x^2}x^3-\frac{1}{2}e^{-x^2}x^5-\frac{1}{2}e^{-x^2}x^7+\frac{3}{2}\int e^{-x^2}x^2\,dx+\frac{5}{2}\int e^{-x^2}x^4\,dx+\frac{7}{2}\int e^{-x^2}x^6\,dx\\
&= -\frac{3}{4}e^{-x^2}x-\frac{7}{4}e^{-x^2}x^3-\frac{9}{4}e^{-x^2}x^5-\frac{1}{2}e^{-x^2}x^7+\frac{3}{4}\int e^{-x^2}\,dx+\frac{15}{4}\int e^{-x^2}x^2\,dx+\frac{35}{4}\int e\\
&= -\frac{21}{8}e^{-x^2}x-\frac{49}{8}e^{-x^2}x^3-\frac{9}{4}e^{-x^2}x^5-\frac{1}{2}e^{-x^2}x^7+\frac{3}{8}\sqrt{\pi}\,\mathrm{erf}(x)+\frac{15}{8}\int e^{-x^2}\,dx+\frac{105}{8}\int e\\
&= -\frac{147}{16}e^{-x^2}x-\frac{49}{8}e^{-x^2}x^3-\frac{9}{4}e^{-x^2}x^5-\frac{1}{2}e^{-x^2}x^7+\frac{21}{16}\sqrt{\pi}\,\mathrm{erf}(x)+\frac{105}{16}\int e^{-x^2}\,dx\\
&= -\frac{147}{16}e^{-x^2}x-\frac{49}{8}e^{-x^2}x^3-\frac{9}{4}e^{-x^2}x^5-\frac{1}{2}e^{-x^2}x^7+\frac{147}{32}\sqrt{\pi}\,\mathrm{erf}(x)
\end{aligned}$$

Mathematica [A] time = 0.03, size = 41, normalized size = 0.62

$$\frac{1}{32}\left(147\sqrt{\pi}\,\mathrm{erf}(x)-2e^{-x^2}x\left(8x^6+36x^4+98x^2+147\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^4 + x^6 + x^8)/E^x^2,x]
[Out] ((-2*x*(147 + 98*x^2 + 36*x^4 + 8*x^6))/E^x^2 + 147*Sqrt[Pi]*Erf[x])/32
```

fricas [A] time = 0.40, size = 35, normalized size = 0.53

$$-\frac{1}{16}\left(8\,x^7+36\,x^5+98\,x^3+147\,x\right)e^{\left(-x^2\right)}+\frac{147}{32}\,\sqrt{\pi}\,\mathrm{erf}(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((x^8+x^6+x^4)/exp(x^2),x, algorithm="fricas")
[Out] -1/16*(8*x^7 + 36*x^5 + 98*x^3 + 147*x)*e^(-x^2) + 147/32*sqrt(pi)*erf(x)
```

giac [A] time = 0.21, size = 35, normalized size = 0.53

$$-\frac{1}{16}\left(8\,x^7+36\,x^5+98\,x^3+147\,x\right)e^{\left(-x^2\right)}+\frac{147}{32}\,\sqrt{\pi}\,\operatorname{erf}(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((x^8+x^6+x^4)/exp(x^2),x, algorithm="giac")
```

```
[Out] -1/16*(8*x^7 + 36*x^5 + 98*x^3 + 147*x)*e^(-x^2) + 147/32*sqrt(pi)*erf(x)
```

maple [A] time = 0.04, size = 51, normalized size = 0.77

$$-\frac{x^7\mathrm{e}^{-x^2}}{2}-\frac{9x^5\mathrm{e}^{-x^2}}{4}-\frac{49x^3\mathrm{e}^{-x^2}}{8}-\frac{147x\,\mathrm{e}^{-x^2}}{16}+\frac{147\sqrt{\pi}\,\operatorname{erf}(x)}{32}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^8+x^6+x^4)/exp(x^2),x)
```

```
[Out] -147/16*x/exp(x^2)-49/8*x^3/exp(x^2)-9/4*x^5/exp(x^2)-1/2*x^7/exp(x^2)+147/
32*erf(x)*Pi^(1/2)
```

maxima [A] time = 0.98, size = 74, normalized size = 1.12

$$-\frac{1}{16}\left(8\,x^7+28\,x^5+70\,x^3+105\,x\right)e^{\left(-x^2\right)}-\frac{1}{8}\left(4\,x^5+10\,x^3+15\,x\right)e^{\left(-x^2\right)}-\frac{1}{4}\left(2\,x^3+3\,x\right)e^{\left(-x^2\right)}+\frac{147}{32}\,\sqrt{\pi}\,\operatorname{erf}(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((x^8+x^6+x^4)/exp(x^2),x, algorithm="maxima")
```

```
[Out] -1/16*(8*x^7 + 28*x^5 + 70*x^3 + 105*x)*e^(-x^2) - 1/8*(4*x^5 + 10*x^3 + 15
*x)*e^(-x^2) - 1/4*(2*x^3 + 3*x)*e^(-x^2) + 147/32*sqrt(pi)*erf(x)
```

mupad [B] time = 3.62, size = 50, normalized size = 0.76

$$\frac{147\,\sqrt{\pi}\,\operatorname{erf}(x)}{32}-\frac{49\,x^3\,\mathrm{e}^{-x^2}}{8}-\frac{9\,x^5\,\mathrm{e}^{-x^2}}{4}-\frac{x^7\,\mathrm{e}^{-x^2}}{2}-\frac{147\,x\,\mathrm{e}^{-x^2}}{16}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(-x^2)*(x^4 + x^6 + x^8),x)
```

```
[Out] (147*pi^(1/2)*erf(x))/32 - (49*x^3*exp(-x^2))/8 - (9*x^5*exp(-x^2))/4 - (x^
7*exp(-x^2))/2 - (147*x*exp(-x^2))/16
```

sympy [A] time = 97.77, size = 54, normalized size = 0.82

$$-\frac{x^7e^{-x^2}}{2}-\frac{9x^5e^{-x^2}}{4}-\frac{49x^3e^{-x^2}}{8}-\frac{147xe^{-x^2}}{16}+\frac{147\sqrt{\pi}\ \text{erf}\,(x)}{32}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((x**8+x**6+x**4)/exp(x**2),x)
```

```
[Out] -x**7*exp(-x**2)/2 - 9*x**5*exp(-x**2)/4 - 49*x**3*exp(-x**2)/8 - 147*x*exp
(-x**2)/16 + 147*sqrt(pi)*erf(x)/32
```

3.728 $\int \frac{1}{-e^x+e^{3x}} dx$

Optimal. Leaf size=12

$$e^{-x} - \tanh^{-1}(e^x)$$

```
[Out] exp(-x)-arctanh(exp(x))
```

Rubi [A] time = 0.01, antiderivative size = 12, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231, Rules used = {2282, 325, 207}

$$e^{-x} - \tanh^{-1}(e^x)$$

Antiderivative was successfully verified.

```
[In] Int[(-E^x + E^(3*x))^(-1),x]
```

```
[Out] E^(-x) - ArcTanh[E^x]
```

Rule 207

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTanh[(Rt[b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (LtQ[a
, 0] || GtQ[b, 0])
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\int \frac{1}{-e^x+e^{3x}}\,dx = \text{Subst}\left(\int \frac{1}{x^2(-1+x^2)}\,dx, x, e^x\right)$$
$$= e^{-x} + \text{Subst}\left(\int \frac{1}{-1+x^2}\,dx, x, e^x\right)$$
$$= e^{-x} - \tanh^{-1}(e^x)$$

Mathematica [C] time = 0.01, size = 19, normalized size = 1.58

$$e^{-x}\,{}_2F_1\left(-\frac{1}{2},1;\frac{1}{2};e^{2x}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(-E^x + E^(3*x))^(-1),x]
[Out] Hypergeometric2F1[-1/2, 1, 1/2, E^(2*x)]/E^x
```

fricas [B] time = 0.41, size = 25, normalized size = 2.08

$$-\frac{1}{2}\left(e^x \log(e^x+1) - e^x \log(e^x-1) - 2\right)e^{(-x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-exp(x)+exp(3*x)),x, algorithm="fricas")
[Out] -1/2*(e^x*log(e^x + 1) - e^x*log(e^x - 1) - 2)*e^(-x)
```

giac [A] time = 0.21, size = 20, normalized size = 1.67

$$e^{(-x)} - \frac{1}{2}\log(e^x+1) + \frac{1}{2}\log(|e^x-1|)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-exp(x)+exp(3*x)),x, algorithm="giac")
[Out] e^(-x) - 1/2*log(e^x + 1) + 1/2*log(abs(e^x - 1))
```

maple [A] time = 0.04, size = 20, normalized size = 1.67

$$\mathrm{e}^{-x} + \frac{\ln(\mathrm{e}^x-1)}{2} - \frac{\ln(\mathrm{e}^x+1)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-exp(x)+exp(3*x)),x)
```

```
[Out] 1/2*ln(exp(x)-1)+1/exp(x)-1/2*ln(exp(x)+1)
```

maxima [A] time = 0.92, size = 19, normalized size = 1.58

$$e^{(-x)} - \frac{1}{2}\log\left(e^{x} + 1\right) + \frac{1}{2}\log\left(e^{x} - 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-exp(x)+exp(3*x)),x, algorithm="maxima")
```

```
[Out] e^(-x) - 1/2*log(e^x + 1) + 1/2*log(e^x - 1)
```

mupad [B] time = 0.06, size = 19, normalized size = 1.58

$$e^{-x} + \frac{\ln\left(e^{x} - 1\right)}{2} - \frac{\ln\left(e^{x} + 1\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(exp(3*x) - exp(x)),x)
```

```
[Out] exp(-x) + log(exp(x) - 1)/2 - log(exp(x) + 1)/2
```

sympy [B] time = 0.12, size = 20, normalized size = 1.67

$$\frac{\log\left(e^{x} - 1\right)}{2} - \frac{\log\left(e^{x} + 1\right)}{2} + e^{-x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-exp(x)+exp(3*x)),x)
```

```
[Out] log(exp(x) - 1)/2 - log(exp(x) + 1)/2 + exp(-x)
```

3.729 $\int \frac{e^x(-5+x+x^2)}{(-1+x)^2} dx$

Optimal. Leaf size=16

$$e^x - \frac{3e^x}{1-x}$$

[Out] exp(x)-3*exp(x)/(1-x)

Rubi [A] time = 0.07, antiderivative size = 16, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267, Rules used = {2199, 2194, 2177, 2178}

$$e^x - \frac{3e^x}{1-x}$$

Antiderivative was successfully verified.

[In] Int[(E^x*(-5 + x + x^2))/(-1 + x)^2,x]

[Out] E^x - (3*E^x)/(1 - x)

Rule 2177

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_), x_Symbol] :> Simp[((c + d*x)^(m + 1)*(b*F^(g*(e + f*x)))^n)/(d*(m + 1))
, x] - Dist[(f*g*n*Log[F])/(d*(m + 1)), Int[(c + d*x)^(m + 1)*(b*F^(g*(e +
f*x)))^n, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && LtQ[m, -1] && Int
egerQ[2*m] &&  !$UseGamma === True
```

Rule 2178

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/((c_.) + (d_.)*(x_)), x_Symbol] :> Si
mp[(F^(g*(e - (c*f)/d))*ExpIntegralEi[(f*g*(c + d*x)*Log[F])/d])/d, x] /; F
reeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2194

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 2199

```
Int[(F_)^((c_.)*(v_))*(u_)^(m_.)*(w_), x_Symbol] :> Int[ExpandIntegrand[F^(
c*ExpandToSum[v, x]), w*NormalizePowerOfLinear[u, x]^m, x], x] /; FreeQ[{F,
 c}, x] && PolynomialQ[w, x] && LinearQ[v, x] && PowerOfLinearQ[u, x] && In
```

```
tegerQ[m] &&  !$UseGamma === True
```

Rubi steps

$$
\begin{aligned}
\int \frac{e^x\left(-5+x+x^2\right)}{(-1+x)^2}\,dx &= \int \left(e^x-\frac{3e^x}{(-1+x)^2}+\frac{3e^x}{-1+x}\right) dx\\
&= -\left(3\int \frac{e^x}{(-1+x)^2}\,dx\right)+3\int \frac{e^x}{-1+x}\,dx+\int e^x\,dx\\
&= e^x-\frac{3e^x}{1-x}+3e\mathrm{Ei}(-1+x)-3\int \frac{e^x}{-1+x}\,dx\\
&= e^x-\frac{3e^x}{1-x}
\end{aligned}
$$

Mathematica [A] time = 0.03, size = 12, normalized size = 0.75

$$\frac{e^x(x+2)}{x-1}$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^x*(-5 + x + x^2))/(-1 + x)^2,x]
[Out] (E^x*(2 + x))/(-1 + x)
```

fricas [A] time = 0.39, size = 11, normalized size = 0.69

$$\frac{(x+2)e^x}{x-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(x^2+x-5)/(-1+x)^2,x, algorithm="fricas")
[Out] (x + 2)*e^x/(x - 1)
```

giac [B] time = 0.22, size = 54, normalized size = 3.38

$$\frac{(x-1)\left(\frac{1}{x-1}+1\right)e^{\left((x-1)\left(\frac{1}{x-1}+1\right)\right)}+2\,e^{\left((x-1)\left(\frac{1}{x-1}+1\right)\right)}}{(x-1)\left(\frac{1}{x-1}+1\right)-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(x^2+x-5)/(-1+x)^2,x, algorithm="giac")
```

```
[Out] ((x - 1)*(1/(x - 1) + 1)*e^((x - 1)*(1/(x - 1) + 1)) + 2*e^((x - 1)*(1/(x -
 1) + 1)))/((x - 1)*(1/(x - 1) + 1) - 1)
```

maple [A] time = 0.02, size = 12, normalized size = 0.75

$$\frac{(x+2)\,\mathrm{e}^{x}}{x-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*(x^2+x-5)/(x-1)^2,x)
```

```
[Out] 1/(x-1)*(x+2)*exp(x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\left(x^{2}+x\right)e^{x}}{x^{2}-2\,x+1}+\frac{5\,eE_{2}\left(-x+1\right)}{x-1}+\int\frac{(3\,x+1)e^{x}}{x^{3}-3\,x^{2}+3\,x-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(x^2+x-5)/(-1+x)^2,x, algorithm="maxima")
```

```
[Out] (x^2 + x)*e^x/(x^2 - 2*x + 1) + 5*e*exp_integral_e(2, -x + 1)/(x - 1) + int
egrate((3*x + 1)*e^x/(x^3 - 3*x^2 + 3*x - 1), x)
```

mupad [B] time = 0.08, size = 11, normalized size = 0.69

$$\frac{\mathrm{e}^{x}\,\left(x+2\right)}{x-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(x)*(x + x^2 - 5))/(x - 1)^2,x)
```

```
[Out] (exp(x)*(x + 2))/(x - 1)
```

sympy [A] time = 0.10, size = 8, normalized size = 0.50

$$\frac{(x+2)\,e^{x}}{x-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(x**2+x-5)/(-1+x)**2,x)
```

```
[Out] (x + 2)*exp(x)/(x - 1)
```

3.730 $\int \frac{e^{x^2} x^3}{\left(1+x^2\right)^2} \, dx$

Optimal. Leaf size=16

$$\frac{e^{x^2}}{2\left(x^2+1\right)}$$

[Out] 1/2*exp(x^2)/(x^2+1)

Rubi [A] time = 0.06, antiderivative size = 16, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.062, Rules used = {2289}

$$\frac{e^{x^2}}{2\left(x^2+1\right)}$$

Antiderivative was successfully verified.

[In] Int[(E^x^2*x^3)/(1 + x^2)^2,x]

[Out] E^x^2/(2*(1 + x^2))

Rule 2289

```
Int[(F_)^(u_)*(v_)^(n_.)*(w_), x_Symbol] :> With[{z = Log[F]*v*D[u, x] + (n
 + 1)*D[v, x]}, Simp[(Coefficient[w, x, Exponent[w, x]]*F^u*v^(n + 1))/Coef
ficient[z, x, Exponent[z, x]], x] /; EqQ[Exponent[w, x], Exponent[z, x]] &&
 EqQ[w*Coefficient[z, x, Exponent[z, x]], z*Coefficient[w, x, Exponent[w, x
]]]] /; FreeQ[{F, n}, x] && PolynomialQ[u, x] && PolynomialQ[v, x] && Polyn
omialQ[w, x]
```

Rubi steps

$$\int \frac{e^{x^2} x^3}{\left(1+x^2\right)^2} \, dx = \frac{e^{x^2}}{2\left(1+x^2\right)}$$

Mathematica [A] time = 0.03, size = 16, normalized size = 1.00

$$\frac{e^{x^2}}{2\left(x^2+1\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^x^2*x^3)/(1 + x^2)^2,x]
[Out] E^x^2/(2*(1 + x^2))
```

fricas [A] time = 0.37, size = 13, normalized size = 0.81

$$\frac{e^{\left(x^2\right)}}{2\left(x^2+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^2)*x^3/(x^2+1)^2,x, algorithm="fricas")
[Out] 1/2*e^(x^2)/(x^2 + 1)
```

giac [A] time = 0.21, size = 13, normalized size = 0.81

$$\frac{e^{\left(x^2\right)}}{2\left(x^2+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^2)*x^3/(x^2+1)^2,x, algorithm="giac")
[Out] 1/2*e^(x^2)/(x^2 + 1)
```

maple [A] time = 0.03, size = 14, normalized size = 0.88

$$\frac{\mathrm{e}^{x^2}}{2x^2+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x^2)*x^3/(x^2+1)^2,x)
[Out] 1/2*exp(x^2)/(x^2+1)
```

maxima [A] time = 1.09, size = 13, normalized size = 0.81

$$\frac{e^{\left(x^2\right)}}{2\left(x^2+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^2)*x^3/(x^2+1)^2,x, algorithm="maxima")
[Out] 1/2*e^(x^2)/(x^2 + 1)
```

mupad [B] time = 3.48, size = 14, normalized size = 0.88

$$\frac{e^{x^2}}{2\left(x^2+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*exp(x^2))/(x^2 + 1)^2,x)
[Out] exp(x^2)/(2*(x^2 + 1))
```

sympy [A] time = 0.09, size = 10, normalized size = 0.62

$$\frac{e^{x^2}}{2x^2+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x**2)*x**3/(x**2+1)**2,x)
[Out] exp(x**2)/(2*x**2 + 2)
```

3.731 $\int \frac{e^{3x}}{\sqrt{25+16e^{2x}}}\,dx$

Optimal. Leaf size=33

$$\frac{1}{32}e^x\sqrt{16e^{2x}+25}-\frac{25}{128}\sinh^{-1}\left(\frac{4e^x}{5}\right)$$

```
[Out] -25/128*arcsinh(4/5*exp(x))+1/32*exp(x)*(25+16*exp(2*x))^(1/2)
```

Rubi [A] time = 0.03, antiderivative size = 33, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {2248, 321, 215}

$$\frac{1}{32}e^x\sqrt{16e^{2x}+25}-\frac{25}{128}\sinh^{-1}\left(\frac{4e^x}{5}\right)$$

Antiderivative was successfully verified.

```
[In] Int[E^(3*x)/Sqrt[25 + 16*E^(2*x)],x]
```

```
[Out] (E^x*Sqrt[25 + 16*E^(2*x)])/32 - (25*ArcSinh[(4*E^x)/5])/128
```

Rule 215

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSinh[(Rt[b, 2]*x)/Sqr
t[a]]/Rt[b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && PosQ[b]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2248

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(g*h*Log[G])/(d*e*Lo
g[F])]}, Dist[(Denominator[m]*G^(f*h - (c*g*h)/d))/(d*e*Log[F]), Subst[Int[
x^(Numerator[m] - 1)*(a + b*x^Denominator[m])^p, x], x, F^((e*(c + d*x))/De
nominator[m])], x] /; LeQ[m, -1] || GeQ[m, 1]] /; FreeQ[{F, G, a, b, c, d,
e, f, g, h, p}, x]
```

Rubi steps

$$
\begin{aligned}
\int \frac{e^{3x}}{\sqrt{25+16e^{2x}}}\,dx &= \text{Subst}\left(\int \frac{x^2}{\sqrt{25+16x^2}}\,dx, x, e^x\right)\\
&= \frac{1}{32}e^x\sqrt{25+16e^{2x}} - \frac{25}{32}\text{Subst}\left(\int \frac{1}{\sqrt{25+16x^2}}\,dx, x, e^x\right)\\
&= \frac{1}{32}e^x\sqrt{25+16e^{2x}} - \frac{25}{128}\sinh^{-1}\left(\frac{4e^x}{5}\right)
\end{aligned}
$$

Mathematica [A] time = 0.02, size = 33, normalized size = 1.00

$$\frac{1}{32}e^x\sqrt{16e^{2x}+25} - \frac{25}{128}\sinh^{-1}\left(\frac{4e^x}{5}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(3*x)/Sqrt[25 + 16*E^(2*x)],x]
[Out] (E^x*Sqrt[25 + 16*E^(2*x)])/32 - (25*ArcSinh[(4*E^x)/5])/128
```

fricas [A] time = 0.40, size = 33, normalized size = 1.00

$$\frac{1}{32}\sqrt{16\,e^{(2\,x)}+25}\,e^x + \frac{25}{128}\log\left(\sqrt{16\,e^{(2\,x)}+25} - 4\,e^x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(3*x)/(25+16*exp(2*x))^(1/2),x, algorithm="fricas")
[Out] 1/32*sqrt(16*e^(2*x) + 25)*e^x + 25/128*log(sqrt(16*e^(2*x) + 25) - 4*e^x)
```

giac [A] time = 0.22, size = 33, normalized size = 1.00

$$\frac{1}{32}\sqrt{16\,e^{(2\,x)}+25}\,e^x + \frac{25}{128}\log\left(\sqrt{16\,e^{(2\,x)}+25} - 4\,e^x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(3*x)/(25+16*exp(2*x))^(1/2),x, algorithm="giac")
[Out] 1/32*sqrt(16*e^(2*x) + 25)*e^x + 25/128*log(sqrt(16*e^(2*x) + 25) - 4*e^x)
```

maple [A] time = 0.04, size = 23, normalized size = 0.70

$$-\frac{25\,\operatorname{arcsinh}\left(\frac{4\,e^x}{5}\right)}{128} + \frac{\sqrt{16\,e^{2x}+25}\;e^x}{32}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(3*x)/(25+16*exp(2*x))^(1/2),x)
```

```
[Out] 1/32*exp(x)*(25+16*exp(x)^2)^(1/2)-25/128*arcsinh(4/5*exp(x))
```

maxima [B] time = 1.05, size = 74, normalized size = 2.24

$$\frac{25\sqrt{16\,e^{(2\,x)}+25}\,e^{(-x)}}{32\left(\left(16\,e^{(2\,x)}+25\right)e^{(-2\,x)}-16\right)}-\frac{25}{256}\log\left(\sqrt{16\,e^{(2\,x)}+25}\,e^{(-x)}+4\right)+\frac{25}{256}\log\left(\sqrt{16\,e^{(2\,x)}+25}\,e^{(-x)}-4\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(3*x)/(25+16*exp(2*x))^(1/2),x, algorithm="maxima")
```

```
[Out] 25/32*sqrt(16*e^(2*x) + 25)*e^(-x)/((16*e^(2*x) + 25)*e^(-2*x) - 16) - 25/2
56*log(sqrt(16*e^(2*x) + 25)*e^(-x) + 4) + 25/256*log(sqrt(16*e^(2*x) + 25)
*e^(-x) - 4)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{\mathrm{e}^{3\,x}}{\sqrt{16\,\mathrm{e}^{2\,x}+25}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(3*x)/(16*exp(2*x) + 25)^(1/2),x)
```

```
[Out] int(exp(3*x)/(16*exp(2*x) + 25)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{3x}}{\sqrt{16e^{2x}+25}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(3*x)/(25+16*exp(2*x))**(1/2),x)
```

```
[Out] Integral(exp(3*x)/sqrt(16*exp(2*x) + 25), x)
```

3.732 $\int \frac{1+e^x}{\sqrt{e^x+x}}\,dx$

Optimal. Leaf size=11

$$2\sqrt{x+e^x}$$

```
[Out] 2*(x+exp(x))^(1/2)
```

Rubi [A] time = 0.03, antiderivative size = 11, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067, Rules used = {6686}

$$2\sqrt{x+e^x}$$

Antiderivative was successfully verified.

```
[In] Int[(1 + E^x)/Sqrt[E^x + x],x]
```

```
[Out] 2*Sqrt[E^x + x]
```

Rule 6686

```
Int[(u_)*(y_)^(m_.), x_Symbol] :> With[{q = DerivativeDivides[y, u, x]}, Si
mp[(q*y^(m + 1))/(m + 1), x] /;  !FalseQ[q]] /; FreeQ[m, x] && NeQ[m, -1]
```

Rubi steps

$$\int \frac{1+e^x}{\sqrt{e^x+x}}\,dx = 2\sqrt{e^x+x}$$

Mathematica [A] time = 0.01, size = 11, normalized size = 1.00

$$2\sqrt{x+e^x}$$

Antiderivative was successfully verified.

```
[In] Integrate[(1 + E^x)/Sqrt[E^x + x],x]
```

```
[Out] 2*Sqrt[E^x + x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+exp(x))/(x+exp(x))^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (has polynomial part)
```

giac [A] time = 0.18, size = 8, normalized size = 0.73

$$2\sqrt{x+e^x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+exp(x))/(x+exp(x))^(1/2),x, algorithm="giac")
```

```
[Out] 2*sqrt(x + e^x)
```

maple [A] time = 0.03, size = 9, normalized size = 0.82

$$2\sqrt{x+e^x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(x)+1)/(exp(x)+x)^(1/2),x)
```

```
[Out] 2*(exp(x)+x)^(1/2)
```

maxima [A] time = 0.95, size = 8, normalized size = 0.73

$$2\sqrt{x+e^x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+exp(x))/(x+exp(x))^(1/2),x, algorithm="maxima")
```

```
[Out] 2*sqrt(x + e^x)
```

mupad [B] time = 3.50, size = 8, normalized size = 0.73

$$2\sqrt{x+e^x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(x) + 1)/(x + exp(x))^(1/2),x)
```

```
[Out] 2*(x + exp(x))^(1/2)
```

sympy [A] time = 0.16, size = 8, normalized size = 0.73

$$2\sqrt{x+e^x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+exp(x))/(exp(x)+x)**(1/2),x)
```

```
[Out] 2*sqrt(x + exp(x))
```

3.733 $\int \frac{1+e^x}{e^x+x} dx$

Optimal. Leaf size=6

$$\log(x+e^x)$$

```
[Out] ln(x+exp(x))
```

Rubi [A] time = 0.02, antiderivative size = 6, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {6684}

$$\log(x+e^x)$$

Antiderivative was successfully verified.

```
[In] Int[(1 + E^x)/(E^x + x),x]
```

```
[Out] Log[E^x + x]
```

Rule 6684

```
Int[(u_)/(y_), x_Symbol] :> With[{q = DerivativeDivides[y, u, x]}, Simp[q*L
og[RemoveContent[y, x]], x] /;  !FalseQ[q]]
```

Rubi steps

$$\int \frac{1+e^x}{e^x+x} dx = \log(e^x+x)$$

Mathematica [A] time = 0.03, size = 6, normalized size = 1.00

$$\log(x+e^x)$$

Antiderivative was successfully verified.

```
[In] Integrate[(1 + E^x)/(E^x + x),x]
```

```
[Out] Log[E^x + x]
```

fricas [A] time = 0.40, size = 5, normalized size = 0.83

$$\log(x+e^x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+exp(x))/(x+exp(x)),x, algorithm="fricas")
```

```
[Out] log(x + e^x)
```

giac [A] time = 0.21, size = 5, normalized size = 0.83

$$\log(x + e^x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+exp(x))/(x+exp(x)),x, algorithm="giac")
```

```
[Out] log(x + e^x)
```

maple [A] time = 0.02, size = 6, normalized size = 1.00

$$\ln(x + e^x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(x)+1)/(x+exp(x)),x)
```

```
[Out] ln(x+exp(x))
```

maxima [A] time = 1.00, size = 5, normalized size = 0.83

$$\log(x + e^x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+exp(x))/(x+exp(x)),x, algorithm="maxima")
```

```
[Out] log(x + e^x)
```

mupad [B] time = 0.03, size = 5, normalized size = 0.83

$$\ln(x + e^x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(x) + 1)/(x + exp(x)),x)
```

```
[Out] log(x + exp(x))
```

sympy [A] time = 0.09, size = 5, normalized size = 0.83

$$\log(x + e^x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+exp(x))/(exp(x)+x),x)
```

```
[Out] log(x + exp(x))
```

3.734 $\int \frac{e^{x^2}}{x^2} dx$

Optimal. Leaf size=19

$$\sqrt{\pi}\,\text{erfi}(x) - \frac{e^{x^2}}{x}$$

```
[Out] -exp(x^2)/x+erfi(x)*Pi^(1/2)
```

Rubi [A] time = 0.02, antiderivative size = 19, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {2214, 2204}

$$\sqrt{\pi}\,\text{Erfi}(x) - \frac{e^{x^2}}{x}$$

Antiderivative was successfully verified.

```
[In] Int[E^x^2/x^2,x]
```

```
[Out] -(E^x^2/x) + Sqrt[Pi]*Erfi[x]
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rubi steps

$$\begin{aligned}\int \frac{e^{x^2}}{x^2} dx &= -\frac{e^{x^2}}{x} + 2\int e^{x^2} dx\\ &= -\frac{e^{x^2}}{x} + \sqrt{\pi}\,\text{erfi}(x)\end{aligned}$$

Mathematica [A] time = 0.00, size = 19, normalized size = 1.00

$$\sqrt{\pi}\,\text{erfi}(x)-\frac{e^{x^2}}{x}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x^2/x^2,x]
[Out] -(E^x^2/x) + Sqrt[Pi]*Erfi[x]
```

fricas [A] time = 0.41, size = 18, normalized size = 0.95

$$\frac{\sqrt{\pi}\,x\,\text{erfi}(x)-e^{\left(x^2\right)}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^2)/x^2,x, algorithm="fricas")
[Out] (sqrt(pi)*x*erfi(x) - e^(x^2))/x
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^{\left(x^2\right)}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^2)/x^2,x, algorithm="giac")
[Out] integrate(e^(x^2)/x^2, x)
```

maple [A] time = 0.03, size = 17, normalized size = 0.89

$$\sqrt{\pi}\;\;\text{erfi}(x)-\frac{\mathrm{e}^{x^2}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x^2)/x^2,x)
[Out] -exp(x^2)/x+erfi(x)*Pi^(1/2)
```

maxima [A] time = 1.15, size = 19, normalized size = 1.00

$$-\frac{\sqrt{-x^2}\,\Gamma\left(-\frac{1}{2},-x^2\right)}{2\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^2)/x^2,x, algorithm="maxima")
[Out] -1/2*sqrt(-x^2)*gamma(-1/2, -x^2)/x
```

mupad [B] time = 3.60, size = 21, normalized size = 1.11

$$-\frac{e^{x^2}}{x}+\sqrt{\pi}\,\operatorname{erfc}\left(x\,1i\right)\,1i$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x^2)/x^2,x)
[Out] pi^(1/2)*erfc(x*1i)*1i - exp(x^2)/x
```

sympy [A] time = 0.47, size = 14, normalized size = 0.74

$$\sqrt{\pi}\,\operatorname{erfi}\left(x\right)-\frac{e^{x^2}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x**2)/x**2,x)
[Out] sqrt(pi)*erfi(x) - exp(x**2)/x
```

3.735 $\int \frac{e^{x^2}(1+4x^4)}{x^2} dx$

Optimal. Leaf size=19

$$2e^{x^2}x - \frac{e^{x^2}}{x}$$

[Out] -exp(x^2)/x+2*exp(x^2)*x

Rubi [A] time = 0.10, antiderivative size = 19, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {6742, 2214, 2204, 2212}

$$2e^{x^2}x - \frac{e^{x^2}}{x}$$

Antiderivative was successfully verified.

[In] Int[(E^x^2*(1 + 4*x^4))/x^2,x]

[Out] -(E^x^2/x) + 2*E^x^2*x

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2212

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m - n + 1)*F^(a + b*(c + d*x)^n))/(b*d*n*
Log[F]), x] - Dist[(m - n + 1)/(b*n*Log[F]), Int[(c + d*x)^(m - n)*F^(a + b
*(c + d*x)^n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/
n] && LtQ[0, (m + 1)/n, 5] && IntegerQ[n] && (LtQ[0, n, m + 1] || LtQ[m, n,
 0])
```

Rule 2214

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((c_.) + (d_.)*(x_))^(m_
.), x_Symbol] :> Simp[((c + d*x)^(m + 1)*F^(a + b*(c + d*x)^n))/(d*(m + 1))
, x] - Dist[(b*n*Log[F])/(m + 1), Int[(c + d*x)^(m + n)*F^(a + b*(c + d*x)^
n), x], x] /; FreeQ[{F, a, b, c, d}, x] && IntegerQ[(2*(m + 1))/n] && LtQ[-
4, (m + 1)/n, 5] && IntegerQ[n] && ((GtQ[n, 0] && LtQ[m, -1]) || (GtQ[-n, 0
] && LeQ[-n, m + 1]))
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\begin{aligned}\int \frac{e^{x^2}\left(1+4x^4\right)}{x^2}\,dx &= \int \left(\frac{e^{x^2}}{x^2}+4e^{x^2}x^2\right)dx\\ &= 4\int e^{x^2}x^2\,dx+\int \frac{e^{x^2}}{x^2}\,dx\\ &= -\frac{e^{x^2}}{x}+2e^{x^2}x\end{aligned}$$

Mathematica [A] time = 0.01, size = 16, normalized size = 0.84

$$\frac{e^{x^2}\left(2x^2-1\right)}{x}$$

Antiderivative was successfully verified.

```
[In] Integrate[(E^x^2*(1 + 4*x^4))/x^2,x]
[Out] (E^x^2*(-1 + 2*x^2))/x
```

fricas [A] time = 0.39, size = 15, normalized size = 0.79

$$\frac{\left(2\,x^2-1\right)e^{\left(x^2\right)}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^2)*(4*x^4+1)/x^2,x, algorithm="fricas")
[Out] (2*x^2 - 1)*e^(x^2)/x
```

giac [A] time = 0.21, size = 20, normalized size = 1.05

$$\frac{2\,x^2e^{\left(x^2\right)}-e^{\left(x^2\right)}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^2)*(4*x^4+1)/x^2,x, algorithm="giac")
[Out] (2*x^2*e^(x^2) - e^(x^2))/x
```

maple [A] time = 0.03, size = 16, normalized size = 0.84

$$\frac{\left(2x^2-1\right) \mathrm{e}^{x^2}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x^2)*(4*x^4+1)/x^2,x)
[Out] exp(x^2)*(2*x^2-1)/x
```

maxima [C] time = 0.74, size = 36, normalized size = 1.89

$$2\,xe^{\left(x^2\right)}+i\sqrt{\pi}\,\operatorname{erf}\left(i\,x\right)-\frac{\sqrt{-x^2}\,\Gamma\left(-\frac{1}{2},-x^2\right)}{2\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^2)*(4*x^4+1)/x^2,x, algorithm="maxima")
[Out] 2*x*e^(x^2) + I*sqrt(pi)*erf(I*x) - 1/2*sqrt(-x^2)*gamma(-1/2, -x^2)/x
```

mupad [B] time = 0.07, size = 15, normalized size = 0.79

$$\frac{\mathrm{e}^{x^2}\,\left(2\,x^2-1\right)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(x^2)*(4*x^4 + 1))/x^2,x)
[Out] (exp(x^2)*(2*x^2 - 1))/x
```

sympy [A] time = 0.09, size = 12, normalized size = 0.63

$$\frac{\left(2x^2-1\right) e^{x^2}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x**2)*(4*x**4+1)/x**2,x)
[Out] (2*x**2 - 1)*exp(x**2)/x
```

3.736 $\int \sqrt{f^x}\,(a+bx)^2\,dx$

Optimal. Leaf size=56

$$-\frac{8b\sqrt{f^x}\,(a+bx)}{\log^2(f)}+\frac{2\sqrt{f^x}\,(a+bx)^2}{\log(f)}+\frac{16b^2\sqrt{f^x}}{\log^3(f)}$$

```
[Out] 16*b^2*(f^x)^(1/2)/ln(f)^3-8*b*(b*x+a)*(f^x)^(1/2)/ln(f)^2+2*(b*x+a)^2*(f^x
)^(1/2)/ln(f)
```

Rubi [A] time = 0.04, antiderivative size = 56, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {2176, 2194}

$$-\frac{8b\sqrt{f^x}\,(a+bx)}{\log^2(f)}+\frac{2\sqrt{f^x}\,(a+bx)^2}{\log(f)}+\frac{16b^2\sqrt{f^x}}{\log^3(f)}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[f^x]*(a + b*x)^2,x]
```

```
[Out] (16*b^2*Sqrt[f^x])/Log[f]^3 - (8*b*Sqrt[f^x]*(a + b*x))/Log[f]^2 + (2*Sqrt[
f^x]*(a + b*x)^2)/Log[f]
```

Rule 2176

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_.), x_Symbol] :> Simp[((c + d*x)^m*(b*F^(g*(e + f*x)))^n)/(f*g*n*Log[F]),
x] - Dist[(d*m)/(f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*(b*F^(g*(e + f*x)))^n
, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && GtQ[m, 0] && IntegerQ[2*m
] &&  !$UseGamma === True
```

Rule 2194

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rubi steps

$$\int \sqrt{f^x}(a+bx)^2\,dx = \frac{2\sqrt{f^x}(a+bx)^2}{\log(f)} - \frac{(4b)\int \sqrt{f^x}(a+bx)\,dx}{\log(f)}$$
$$= -\frac{8b\sqrt{f^x}(a+bx)}{\log^2(f)} + \frac{2\sqrt{f^x}(a+bx)^2}{\log(f)} + \frac{(8b^2)\int \sqrt{f^x}\,dx}{\log^2(f)}$$
$$= \frac{16b^2\sqrt{f^x}}{\log^3(f)} - \frac{8b\sqrt{f^x}(a+bx)}{\log^2(f)} + \frac{2\sqrt{f^x}(a+bx)^2}{\log(f)}$$

Mathematica [A] time = 0.05, size = 41, normalized size = 0.73

$$\frac{2\sqrt{f^x}\left(\log^2(f)(a+bx)^2 - 4b\log(f)(a+bx) + 8b^2\right)}{\log^3(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[f^x]*(a + b*x)^2,x]
```

```
[Out] (2*Sqrt[f^x]*(8*b^2 - 4*b*(a + b*x)*Log[f] + (a + b*x)^2*Log[f]^2))/Log[f]^
3
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2*(f^x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (has polynomial part)
```

giac [B] time = 0.30, size = 1415, normalized size = 25.27

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2*(f^x)^(1/2),x, algorithm="giac")
```

```
[Out] -2*((2*(pi*b^2*x^2*log(abs(f))*sgn(f) - pi*b^2*x^2*log(abs(f)) + 2*pi*a*b*x
*log(abs(f))*sgn(f) - 2*pi*a*b*x*log(abs(f)) - 2*pi*b^2*x*sgn(f) + pi*a^2*l
og(abs(f))*sgn(f) + 2*pi*b^2*x - pi*a^2*log(abs(f)) - 2*pi*a*b*sgn(f) + 2*p
i*a*b)*(pi^3*sgn(f) - 3*pi*log(abs(f))^2*sgn(f) - pi^3 + 3*pi*log(abs(f))^2
```

```
)/((pi^3*sgn(f) - 3*pi*log(abs(f))^2*sgn(f) - pi^3 + 3*pi*log(abs(f))^2)^2
+ (3*pi^2*log(abs(f))*sgn(f) - 3*pi^2*log(abs(f)) + 2*log(abs(f))^3)^2) - (
pi^2*b^2*x^2*sgn(f) - pi^2*b^2*x^2 + 2*b^2*x^2*log(abs(f))^2 + 2*pi^2*a*b*x
*sgn(f) - 2*pi^2*a*b*x + 4*a*b*x*log(abs(f))^2 + pi^2*a^2*sgn(f) - pi^2*a^2
 - 8*b^2*x*log(abs(f)) + 2*a^2*log(abs(f))^2 - 8*a*b*log(abs(f)) + 16*b^2)*
(3*pi^2*log(abs(f))*sgn(f) - 3*pi^2*log(abs(f)) + 2*log(abs(f))^3)/((pi^3*s
gn(f) - 3*pi*log(abs(f))^2*sgn(f) - pi^3 + 3*pi*log(abs(f))^2)^2 + (3*pi^2*
log(abs(f))*sgn(f) - 3*pi^2*log(abs(f)) + 2*log(abs(f))^3)^2))*cos(-1/4*pi*
x*sgn(f) + 1/4*pi*x) - ((pi^2*b^2*x^2*sgn(f) - pi^2*b^2*x^2 + 2*b^2*x^2*log
(abs(f))^2 + 2*pi^2*a*b*x*sgn(f) - 2*pi^2*a*b*x + 4*a*b*x*log(abs(f))^2 + p
i^2*a^2*sgn(f) - pi^2*a^2 - 8*b^2*x*log(abs(f)) + 2*a^2*log(abs(f))^2 - 8*a
*b*log(abs(f)) + 16*b^2)*(pi^3*sgn(f) - 3*pi*log(abs(f))^2*sgn(f) - pi^3 +
3*pi*log(abs(f))^2)/((pi^3*sgn(f) - 3*pi*log(abs(f))^2*sgn(f) - pi^3 + 3*pi
*log(abs(f))^2)^2 + (3*pi^2*log(abs(f))*sgn(f) - 3*pi^2*log(abs(f)) + 2*log
(abs(f))^3)^2) + 2*(pi*b^2*x^2*log(abs(f))*sgn(f) - pi*b^2*x^2*log(abs(f))
+ 2*pi*a*b*x*log(abs(f))*sgn(f) - 2*pi*a*b*x*log(abs(f)) - 2*pi*b^2*x*sgn(f
) + pi*a^2*log(abs(f))*sgn(f) + 2*pi*b^2*x - pi*a^2*log(abs(f)) - 2*pi*a*b*
sgn(f) + 2*pi*a*b)*(3*pi^2*log(abs(f))*sgn(f) - 3*pi^2*log(abs(f)) + 2*log(
abs(f))^3)/((pi^3*sgn(f) - 3*pi*log(abs(f))^2*sgn(f) - pi^3 + 3*pi*log(abs(
f))^2)^2 + (3*pi^2*log(abs(f))*sgn(f) - 3*pi^2*log(abs(f)) + 2*log(abs(f))^
3)^2))*sin(-1/4*pi*x*sgn(f) + 1/4*pi*x))*abs(f)^(1/2*x) + abs(f)^(1/2*x)*((
pi^2*b^2*i*x^2*sgn(f) - pi^2*b^2*i*x^2 + 2*b^2*i*x^2*log(abs(f))^2 + 2*pi^2
*a*b*i*x*sgn(f) - 2*pi*b^2*x^2*log(abs(f))*sgn(f) - 2*pi^2*a*b*i*x + 2*pi*b
^2*x^2*log(abs(f)) + 4*a*b*i*x*log(abs(f))^2 + pi^2*a^2*i*sgn(f) - 4*pi*a*b
*x*log(abs(f))*sgn(f) - pi^2*a^2*i + 4*pi*a*b*x*log(abs(f)) - 8*b^2*i*x*log
(abs(f)) + 2*a^2*i*log(abs(f))^2 + 4*pi*b^2*x*sgn(f) - 2*pi*a^2*log(abs(f))
*sgn(f) - 4*pi*b^2*x + 2*pi*a^2*log(abs(f)) - 8*a*b*i*log(abs(f)) + 4*pi*a*
b*sgn(f) - 4*pi*a*b + 16*b^2*i)*e^(1/4*pi*i*x*(sgn(f) - 1))/(pi^3*i*sgn(f)
- 3*pi*i*log(abs(f))^2*sgn(f) - pi^3*i + 3*pi*i*log(abs(f))^2 - 3*pi^2*log(
abs(f))*sgn(f) + 3*pi^2*log(abs(f)) - 2*log(abs(f))^3) + (pi^2*b^2*i*x^2*sg
n(f) - pi^2*b^2*i*x^2 + 2*b^2*i*x^2*log(abs(f))^2 + 2*pi^2*a*b*i*x*sgn(f) +
 2*pi*b^2*x^2*log(abs(f))*sgn(f) - 2*pi^2*a*b*i*x - 2*pi*b^2*x^2*log(abs(f)
) + 4*a*b*i*x*log(abs(f))^2 + pi^2*a^2*i*sgn(f) + 4*pi*a*b*x*log(abs(f))*sg
n(f) - pi^2*a^2*i - 4*pi*a*b*x*log(abs(f)) - 8*b^2*i*x*log(abs(f)) + 2*a^2*
i*log(abs(f))^2 - 4*pi*b^2*x*sgn(f) + 2*pi*a^2*log(abs(f))*sgn(f) + 4*pi*b^
2*x - 2*pi*a^2*log(abs(f)) - 8*a*b*i*log(abs(f)) - 4*pi*a*b*sgn(f) + 4*pi*a
*b + 16*b^2*i)*e^(-1/4*pi*i*x*(sgn(f) - 1))/(pi^3*i*sgn(f) - 3*pi*i*log(abs
(f))^2*sgn(f) - pi^3*i + 3*pi*i*log(abs(f))^2 + 3*pi^2*log(abs(f))*sgn(f) -
 3*pi^2*log(abs(f)) + 2*log(abs(f))^3))/i
```

maple [A] time = 0.03, size = 60, normalized size = 1.07

$$\frac{2\left(b^2x^2\ln(f)^2+2abx\ln(f)^2+a^2\ln(f)^2-4b^2x\ln(f)-4ab\ln(f)+8b^2\right)\sqrt{f^x}}{\ln(f)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^2*(f^x)^(1/2),x)
```

```
[Out] 2*(b^2*x^2*ln(f)^2+2*ln(f)^2*a*b*x+ln(f)^2*a^2-4*ln(f)*b^2*x-4*ln(f)*b*a+8*
b^2)*(f^x)^(1/2)/ln(f)^3
```

maxima [A] time = 0.91, size = 63, normalized size = 1.12

$$\frac{4\left(x\log(f)-2\right)abf^{\frac{1}{2}x}}{\log(f)^2}+\frac{2\,a^2f^{\frac{1}{2}x}}{\log(f)}+\frac{2\left(x^2\log(f)^2-4\,x\log(f)+8\right)b^2f^{\frac{1}{2}x}}{\log(f)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2*(f^x)^(1/2),x, algorithm="maxima")
```

```
[Out] 4*(x*log(f) - 2)*a*b*f^(1/2*x)/log(f)^2 + 2*a^2*f^(1/2*x)/log(f) + 2*(x^2*l
og(f)^2 - 4*x*log(f) + 8)*b^2*f^(1/2*x)/log(f)^3
```

mupad [B] time = 3.67, size = 62, normalized size = 1.11

$$\sqrt{f^x}\,\left(\frac{2\,a^2\,\ln(f)^2-8\,a\,b\,\ln(f)+16\,b^2}{\ln(f)^3}+\frac{2\,b^2\,x^2}{\ln(f)}-\frac{4\,b\,x\,\left(2\,b-a\,\ln(f)\right)}{\ln(f)^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f^x)^(1/2)*(a + b*x)^2,x)
```

```
[Out] (f^x)^(1/2)*((2*a^2*log(f)^2 + 16*b^2 - 8*a*b*log(f))/log(f)^3 + (2*b^2*x^2
)/log(f) - (4*b*x*(2*b - a*log(f)))/log(f)^2)
```

sympy [A] time = 0.15, size = 94, normalized size = 1.68

$$\begin{cases}\frac{\left(2a^2\log{(f)}^2+4abx\log{(f)}^2-8ab\log{(f)}+2b^2x^2\log{(f)}^2-8b^2x\log{(f)}+16b^2\right)\sqrt{f^x}}{\log{(f)}^3} & \text{for}\ \log{(f)}^3\neq 0\\ a^2x+abx^2+\frac{b^2x^3}{3} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**2*(f**x)**(1/2),x)
```

```
[Out] Piecewise(((2*a**2*log(f)**2 + 4*a*b*x*log(f)**2 - 8*a*b*log(f) + 2*b**2*x*
*2*log(f)**2 - 8*b**2*x*log(f) + 16*b**2)*sqrt(f**x)/log(f)**3, Ne(log(f)**
3, 0)), (a**2*x + a*b*x**2 + b**2*x**3/3, True))
```

3.737 $\int 3^{1+x^2} x \, dx$

Optimal. Leaf size=15

$$\frac{3^{x^2+1}}{2\log(3)}$$

```
[Out] 1/2*3^(x^2+1)/ln(3)
```

Rubi [A] time = 0.01, antiderivative size = 15, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2209}

$$\frac{3^{x^2+1}}{2\log(3)}$$

Antiderivative was successfully verified.

```
[In] Int[3^(1 + x^2)*x,x]
```

```
[Out] 3^(1 + x^2)/(2*Log[3])
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rubi steps

$$\int 3^{1+x^2} x \, dx = \frac{3^{1+x^2}}{2\log(3)}$$

Mathematica [A] time = 0.00, size = 12, normalized size = 0.80

$$\frac{3^{x^2+1}}{\log(9)}$$

Antiderivative was successfully verified.

```
[In] Integrate[3^(1 + x^2)*x,x]
```

```
[Out] 3^(1 + x^2)/Log[9]
```

fricas [A] time = 0.39, size = 13, normalized size = 0.87

$$\frac{3^{x^2+1}}{2\,\log(3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(3^(x^2+1)*x,x, algorithm="fricas")
```

```
[Out] 1/2*3^(x^2 + 1)/log(3)
```

giac [A] time = 0.21, size = 13, normalized size = 0.87

$$\frac{3^{x^2+1}}{2\,\log(3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(3^(x^2+1)*x,x, algorithm="giac")
```

```
[Out] 1/2*3^(x^2 + 1)/log(3)
```

maple [A] time = 0.03, size = 14, normalized size = 0.93

$$\frac{3^{x^2+1}}{2\ln(3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(3^(x^2+1)*x,x)
```

```
[Out] 1/2*3^(x^2+1)/ln(3)
```

maxima [A] time = 0.49, size = 13, normalized size = 0.87

$$\frac{3^{x^2+1}}{2\,\log(3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(3^(x^2+1)*x,x, algorithm="maxima")
```

```
[Out] 1/2*3^(x^2 + 1)/log(3)
```

mupad [B] time = 3.50, size = 11, normalized size = 0.73

$$\frac{3\,3^{x^2}}{2\,\ln(3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(3^(x^2 + 1)*x,x)
```

```
[Out] (3*3^(x^2))/(2*log(3))
```

sympy [A] time = 0.10, size = 10, normalized size = 0.67

$$\frac{3^{x^2+1}}{2\log(3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(3**(x**2+1)*x,x)
```

```
[Out] 3**(x**2 + 1)/(2*log(3))
```

3.738 $\int \frac{2^{\sqrt{x}}}{\sqrt{x}} \, dx$

Optimal. Leaf size=14

$$\frac{2^{\sqrt{x}+1}}{\log(2)}$$

```
[Out] 2^(1+x^(1/2))/ln(2)
```

Rubi [A] time = 0.01, antiderivative size = 14, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2209}

$$\frac{2^{\sqrt{x}+1}}{\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[2^Sqrt[x]/Sqrt[x],x]
```

```
[Out] 2^(1 + Sqrt[x])/Log[2]
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{2^{\sqrt{x}}}{\sqrt{x}} \, dx = \frac{2^{1+\sqrt{x}}}{\log(2)}$$

Mathematica [A] time = 0.00, size = 14, normalized size = 1.00

$$\frac{2^{\sqrt{x}+1}}{\log(2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^Sqrt[x]/Sqrt[x],x]
```

```
[Out] 2^(1 + Sqrt[x])/Log[2]
```

fricas [A] time = 0.41, size = 11, normalized size = 0.79

$$\frac{2 \cdot 2^{\left(\sqrt{x}\right)}}{\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(x^(1/2))/x^(1/2),x, algorithm="fricas")
[Out] 2*2^sqrt(x)/log(2)
```

giac [A] time = 0.18, size = 11, normalized size = 0.79

$$\frac{2 \cdot 2^{\left(\sqrt{x}\right)}}{\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(x^(1/2))/x^(1/2),x, algorithm="giac")
[Out] 2*2^sqrt(x)/log(2)
```

maple [A] time = 0.02, size = 12, normalized size = 0.86

$$\frac{2\,2^{\sqrt{x}}}{\ln(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^(x^(1/2))/x^(1/2),x)
[Out] 2/ln(2)*2^(x^(1/2))
```

maxima [A] time = 0.78, size = 12, normalized size = 0.86

$$\frac{2^{\sqrt{x}+1}}{\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2^(x^(1/2))/x^(1/2),x, algorithm="maxima")
[Out] 2^(sqrt(x) + 1)/log(2)
```

mupad [B] time = 3.59, size = 11, normalized size = 0.79

$$\frac{2\,2^{\sqrt{x}}}{\ln(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^(x^(1/2))/x^(1/2),x)
```

```
[Out] (2*2^(x^(1/2)))/log(2)
```

sympy [A] time = 0.15, size = 10, normalized size = 0.71

$$\frac{2 \cdot 2^{\sqrt{x}}}{\log{(2)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**(x**(1/2))/x**(1/2),x)
```

```
[Out] 2*2**(sqrt(x))/log(2)
```

3.739 $\int \frac{2^{\frac{1}{x}}}{x^2} dx$

Optimal. Leaf size=11

$$-\frac{2^{\frac{1}{x}}}{\log(2)}$$

```
[Out] -2^(1/x)/ln(2)
```

Rubi [A] time = 0.01, antiderivative size = 11, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2209}

$$-\frac{2^{\frac{1}{x}}}{\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[2^x^(-1)/x^2,x]
```

```
[Out] -(2^x^(-1)/Log[2])
```

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{2^{\frac{1}{x}}}{x^2} dx = -\frac{2^{\frac{1}{x}}}{\log(2)}$$

Mathematica [A] time = 0.00, size = 11, normalized size = 1.00

$$-\frac{2^{\frac{1}{x}}}{\log(2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^x^(-1)/x^2,x]
```

[Out] -(2^x^(-1)/Log[2])

fricas [A] time = 0.41, size = 11, normalized size = 1.00

$$-\frac{2^{\left(\frac{1}{x}\right)}}{\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(2^(1/x)/x^2,x, algorithm="fricas")

[Out] -2^(1/x)/log(2)

giac [A] time = 0.18, size = 11, normalized size = 1.00

$$-\frac{2^{\left(\frac{1}{x}\right)}}{\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(2^(1/x)/x^2,x, algorithm="giac")

[Out] -2^(1/x)/log(2)

maple [A] time = 0.03, size = 12, normalized size = 1.09

$$-\frac{2^{\frac{1}{x}}}{\ln(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(2^(1/x)/x^2,x)

[Out] -2^(1/x)/ln(2)

maxima [A] time = 0.99, size = 11, normalized size = 1.00

$$-\frac{2^{\left(\frac{1}{x}\right)}}{\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(2^(1/x)/x^2,x, algorithm="maxima")

[Out] -2^(1/x)/log(2)

mupad [B] time = 3.50, size = 11, normalized size = 1.00

$$-\frac{2^{1/x}}{\ln(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2^(1/x)/x^2,x)
```

```
[Out] -2^(1/x)/log(2)
```

sympy [A] time = 0.10, size = 8, normalized size = 0.73

$$-\frac{2^{\frac{1}{x}}}{\log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2**(1/x)/x**2,x)
```

```
[Out] -2**(1/x)/log(2)
```

3.740 $\int (2^{-x}+2^x)\,dx$

Optimal. Leaf size=20

$$\frac{2^x}{\log(2)}-\frac{2^{-x}}{\log(2)}$$

```
[Out] -1/(2^x)/ln(2)+2^x/ln(2)
```

Rubi [A] time = 0.01, antiderivative size = 20, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 1, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2194}

$$\frac{2^x}{\log(2)}-\frac{2^{-x}}{\log(2)}$$

Antiderivative was successfully verified.

```
[In] Int[2^(-x) + 2^x,x]
```

```
[Out] -(1/(2^x*Log[2])) + 2^x/Log[2]
```

Rule 2194

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rubi steps

$$\begin{aligned}\int (2^{-x}+2^x)\,dx &= \int 2^{-x}\,dx+\int 2^x\,dx\\ &= -\frac{2^{-x}}{\log(2)}+\frac{2^x}{\log(2)}\end{aligned}$$

Mathematica [A] time = 0.00, size = 20, normalized size = 1.00

$$\frac{2^x}{\log(2)}-\frac{2^{-x}}{\log(2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[2^(-x) + 2^x,x]
```

```
[Out] -(1/(2^x*Log[2])) + 2^x/Log[2]
```

fricas [A] time = 0.39, size = 17, normalized size = 0.85

$$\frac{2^{2x} - 1}{2^x \log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(2^x)+2^x,x, algorithm="fricas")
[Out] (2^(2*x) - 1)/(2^x*log(2))
```

giac [A] time = 0.21, size = 20, normalized size = 1.00

$$\frac{2^x}{\log(2)} - \frac{1}{2^x \log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(2^x)+2^x,x, algorithm="giac")
[Out] 2^x/log(2) - 1/(2^x*log(2))
```

maple [A] time = 0.02, size = 21, normalized size = 1.05

$$\frac{2^x}{\ln(2)} - \frac{2^{-x}}{\ln(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(2^x)+2^x,x)
[Out] -1/(2^x)/ln(2)+2^x/ln(2)
```

maxima [A] time = 0.65, size = 20, normalized size = 1.00

$$\frac{2^x}{\log(2)} - \frac{1}{2^x \log(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(2^x)+2^x,x, algorithm="maxima")
[Out] 2^x/log(2) - 1/(2^x*log(2))
```

mupad [B] time = 3.45, size = 17, normalized size = 0.85

$$\frac{2^{2x} - 1}{2^x \ln(2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/2^x + 2^x,x)
```

```
[Out] (2^(2*x) - 1)/(2^x*log(2))
```

sympy [A] time = 0.11, size = 17, normalized size = 0.85

$$\frac{2^{x}\log{(2)} - 2^{-x}\log{(2)}}{\log{(2)}^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(2**x)+2**x,x)
```

```
[Out] (2**x*log(2) - 2**(-x)*log(2))/log(2)**2
```

3.741 $\int e^{-4x}\left(2-3x+x^2\right)\,dx$

Optimal. Leaf size=32

$$-\frac{1}{4}e^{-4x}x^2+\frac{5}{8}e^{-4x}x-\frac{11e^{-4x}}{32}$$

```
[Out] -11/32/exp(4*x)+5/8*x/exp(4*x)-1/4*x^2/exp(4*x)
```

Rubi [A] time = 0.04, antiderivative size = 32, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 3, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.214, Rules used = {2196, 2194, 2176}

$$-\frac{1}{4}e^{-4x}x^2+\frac{5}{8}e^{-4x}x-\frac{11e^{-4x}}{32}$$

Antiderivative was successfully verified.

```
[In] Int[(2 - 3*x + x^2)/E^(4*x),x]
```

```
[Out] -11/(32*E^(4*x)) + (5*x)/(8*E^(4*x)) - x^2/(4*E^(4*x))
```

Rule 2176

```
Int[((b_.)*(F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m
_.), x_Symbol] :> Simp[((c + d*x)^m*(b*F^(g*(e + f*x)))^n)/(f*g*n*Log[F]),
x] - Dist[(d*m)/(f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*(b*F^(g*(e + f*x)))^n
, x], x] /; FreeQ[{F, b, c, d, e, f, g, n}, x] && GtQ[m, 0] && IntegerQ[2*m
] &&  !$UseGamma === True
```

Rule 2194

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 2196

```
Int[(F_)^((c_.)*(v_))*(u_), x_Symbol] :> Int[ExpandIntegrand[F^(c*ExpandToS
um[v, x]), u, x], x] /; FreeQ[{F, c}, x] && PolynomialQ[u, x] && LinearQ[v,
 x] &&  !$UseGamma === True
```

Rubi steps

$$\begin{aligned}
\int e^{-4x}\left(2-3x+x^2\right)dx &= \int \left(2e^{-4x}-3e^{-4x}x+e^{-4x}x^2\right)dx \\
&= 2\int e^{-4x}\,dx - 3\int e^{-4x}x\,dx + \int e^{-4x}x^2\,dx \\
&= -\frac{1}{2}e^{-4x} + \frac{3}{4}e^{-4x}x - \frac{1}{4}e^{-4x}x^2 + \frac{1}{2}\int e^{-4x}x\,dx - \frac{3}{4}\int e^{-4x}\,dx \\
&= -\frac{5}{16}e^{-4x} + \frac{5}{8}e^{-4x}x - \frac{1}{4}e^{-4x}x^2 + \frac{1}{8}\int e^{-4x}\,dx \\
&= -\frac{11}{32}e^{-4x} + \frac{5}{8}e^{-4x}x - \frac{1}{4}e^{-4x}x^2
\end{aligned}$$

Mathematica [**A**] time = 0.02, size = 19, normalized size = 0.59

$$-\frac{1}{32}e^{-4x}\left(8x^2-20x+11\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(2 - 3*x + x^2)/E^(4*x),x]
[Out] -1/32*(11 - 20*x + 8*x^2)/E^(4*x)
```

fricas [**A**] time = 0.39, size = 16, normalized size = 0.50

$$-\frac{1}{32}\left(8\,x^2-20\,x+11\right)e^{(-4\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((x^2-3*x+2)/exp(4*x),x, algorithm="fricas")
[Out] -1/32*(8*x^2 - 20*x + 11)*e^(-4*x)
```

giac [**A**] time = 0.21, size = 16, normalized size = 0.50

$$-\frac{1}{32}\left(8\,x^2-20\,x+11\right)e^{(-4\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((x^2-3*x+2)/exp(4*x),x, algorithm="giac")
[Out] -1/32*(8*x^2 - 20*x + 11)*e^(-4*x)
```

maple [A] time = 0.02, size = 19, normalized size = 0.59

$$-\frac{\left(8x^2-20x+11\right)e^{-4x}}{32}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2-3*x+2)/exp(4*x),x)
[Out] -1/32*(8*x^2-20*x+11)/exp(4*x)
```

maxima [A] time = 0.53, size = 34, normalized size = 1.06

$$-\frac{1}{32}\left(8\,x^2+4\,x+1\right)e^{(-4\,x)}+\frac{3}{16}\,(4\,x+1)e^{(-4\,x)}-\frac{1}{2}\,e^{(-4\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((x^2-3*x+2)/exp(4*x),x, algorithm="maxima")
[Out] -1/32*(8*x^2 + 4*x + 1)*e^(-4*x) + 3/16*(4*x + 1)*e^(-4*x) - 1/2*e^(-4*x)
```

mupad [B] time = 0.05, size = 16, normalized size = 0.50

$$-\frac{e^{-4\,x}\,\left(8\,x^2-20\,x+11\right)}{32}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(-4*x)*(x^2 - 3*x + 2),x)
[Out] -(exp(-4*x)*(8*x^2 - 20*x + 11))/32
```

sympy [A] time = 0.09, size = 15, normalized size = 0.47

$$\frac{\left(-8x^2+20x-11\right)e^{-4x}}{32}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((x**2-3*x+2)/exp(4*x),x)
[Out] (-8*x**2 + 20*x - 11)*exp(-4*x)/32
```

3.742 $\int \left(k^{x/2}+x^{\sqrt{k}}\right)\,dx$

Optimal. Leaf size=33

$$\frac{2k^{x/2}}{\log(k)}+\frac{x^{\sqrt{k}+1}}{\sqrt{k}+1}$$

```
[Out] 2*k^(1/2*x)/ln(k)+x^(1+k^(1/2))/(1+k^(1/2))
```

Rubi [A] time = 0.01, antiderivative size = 33, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067, Rules used = {2194}

$$\frac{2k^{x/2}}{\log(k)}+\frac{x^{\sqrt{k}+1}}{\sqrt{k}+1}$$

Antiderivative was successfully verified.

```
[In] Int[k^(x/2) + x^Sqrt[k],x]
```

```
[Out] x^(1 + Sqrt[k])/(1 + Sqrt[k]) + (2*k^(x/2))/Log[k]
```

Rule 2194

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rubi steps

$$\begin{aligned}\int \left(k^{x/2}+x^{\sqrt{k}}\right)\,dx&=\frac{x^{1+\sqrt{k}}}{1+\sqrt{k}}+\int k^{x/2}\,dx\\&=\frac{x^{1+\sqrt{k}}}{1+\sqrt{k}}+\frac{2k^{x/2}}{\log(k)}\end{aligned}$$

Mathematica [A] time = 0.02, size = 33, normalized size = 1.00

$$\frac{2k^{x/2}}{\log(k)}+\frac{x^{\sqrt{k}+1}}{\sqrt{k}+1}$$

Antiderivative was successfully verified.

```
[In] Integrate[k^(x/2) + x^Sqrt[k],x]
```

[Out] x^(1 + Sqrt[k])/(1 + Sqrt[k]) + (2*k^(x/2))/Log[k]

fricas [A] time = 0.41, size = 40, normalized size = 1.21

$$\frac{2(k-1)k^{\frac{1}{2}x} + \left(\sqrt{k}\,x\log(k) - x\log(k)\right)x^{\left(\sqrt{k}\right)}}{(k-1)\log(k)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(k^(1/2*x)+x^(k^(1/2)),x, algorithm="fricas")

[Out] (2*(k - 1)*k^(1/2*x) + (sqrt(k)*x*log(k) - x*log(k))*x^sqrt(k))/((k - 1)*lo
g(k))

giac [A] time = 0.19, size = 27, normalized size = 0.82

$$\frac{x^{\sqrt{k}+1}}{\sqrt{k}+1} + \frac{2\sqrt{k^x}}{\log(k)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(k^(1/2*x)+x^(k^(1/2)),x, algorithm="giac")

[Out] x^(sqrt(k) + 1)/(sqrt(k) + 1) + 2*sqrt(k^x)/log(k)

maple [A] time = 0.02, size = 28, normalized size = 0.85

$$\frac{x^{\sqrt{k}+1}}{\sqrt{k}+1} + \frac{2k^{\frac{x}{2}}}{\ln(k)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(k^(1/2*x)+x^(k^(1/2)),x)

[Out] 2*k^(1/2*x)/ln(k)+x^(1+k^(1/2))/(1+k^(1/2))

maxima [A] time = 1.19, size = 27, normalized size = 0.82

$$\frac{x^{\sqrt{k}+1}}{\sqrt{k}+1} + \frac{2k^{\frac{1}{2}x}}{\log(k)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(k^(1/2*x)+x^(k^(1/2)),x, algorithm="maxima")

[Out] x^(sqrt(k) + 1)/(sqrt(k) + 1) + 2*k^(1/2*x)/log(k)

mupad [B] time = 3.63, size = 26, normalized size = 0.79

$$\frac{2\,k^{x/2}}{\ln(k)}+\frac{x\,x^{\sqrt{k}}}{\sqrt{k}\,+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(k^(x/2) + x^(k^(1/2)),x)
```

```
[Out] (2*k^(x/2))/log(k) + (x*x^(k^(1/2)))/(k^(1/2) + 1)
```

sympy [A] time = 0.10, size = 36, normalized size = 1.09

$$\begin{cases} \frac{2k^{\frac{x}{2}}}{\log{(k)}} & \text{for}\ \log{(k)} \neq 0 \\ x & \text{otherwise} \end{cases} + \begin{cases} \frac{x^{\sqrt{k}+1}}{\sqrt{k}+1} & \text{for}\ \sqrt{k} \neq -1 \\ \log{(x)} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(k**(1/2*x)+x**(k**(1/2)),x)
```

```
[Out] Piecewise((2*k**(x/2)/log(k), Ne(log(k), 0)), (x, True)) + Piecewise((x**(s
qrt(k) + 1)/(sqrt(k) + 1), Ne(sqrt(k), -1)), (log(x), True))
```

3.743 $\int \frac{10^{\sqrt{x}}}{\sqrt{x}}\,dx$

Optimal. Leaf size=21

$$\frac{2^{\sqrt{x}+1}5^{\sqrt{x}}}{\log(10)}$$

[Out] 2^(1+x^(1/2))*5^(x^(1/2))/ln(10)

Rubi [A] time = 0.01, antiderivative size = 21, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2209}

$$\frac{2^{\sqrt{x}+1}5^{\sqrt{x}}}{\log(10)}$$

Antiderivative was successfully verified.

[In] Int[10^Sqrt[x]/Sqrt[x],x]

[Out] (2^(1 + Sqrt[x])*5^Sqrt[x])/Log[10]

Rule 2209

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^n*F^(a + b*(c + d*x)^n))/(b*f*n*(c + d*x)^
n*Log[F]), x] /; FreeQ[{F, a, b, c, d, e, f, n}, x] && EqQ[m, n - 1] && EqQ
[d*e - c*f, 0]
```

Rubi steps

$$\int \frac{10^{\sqrt{x}}}{\sqrt{x}}\,dx = \frac{2^{1+\sqrt{x}}5^{\sqrt{x}}}{\log(10)}$$

Mathematica [A] time = 0.00, size = 21, normalized size = 1.00

$$\frac{2^{\sqrt{x}+1}5^{\sqrt{x}}}{\log(10)}$$

Antiderivative was successfully verified.

[In] Integrate[10^Sqrt[x]/Sqrt[x],x]

[Out] (2^(1 + Sqrt[x])*5^Sqrt[x])/Log[10]

fricas [A] time = 0.40, size = 11, normalized size = 0.52

$$\frac{2 \cdot 10^{\left(\sqrt{x}\right)}}{\log\left(10\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(10^(x^(1/2))/x^(1/2),x, algorithm="fricas")

[Out] 2*10^sqrt(x)/log(10)

giac [A] time = 0.18, size = 11, normalized size = 0.52

$$\frac{2 \cdot 10^{\left(\sqrt{x}\right)}}{\log\left(10\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(10^(x^(1/2))/x^(1/2),x, algorithm="giac")

[Out] 2*10^sqrt(x)/log(10)

maple [A] time = 0.02, size = 12, normalized size = 0.57

$$\frac{2 10^{\sqrt{x}}}{\ln\left(10\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(10^(x^(1/2))/x^(1/2),x)

[Out] 2/ln(10)*10^(x^(1/2))

maxima [A] time = 1.08, size = 11, normalized size = 0.52

$$\frac{2 \cdot 10^{\left(\sqrt{x}\right)}}{\log\left(10\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(10^(x^(1/2))/x^(1/2),x, algorithm="maxima")

[Out] 2*10^sqrt(x)/log(10)

mupad [B]   time = 3.49, size = 11, normalized size = 0.52

$$\frac{2 10^{\sqrt{x}}}{\ln (10)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(10^(x^(1/2))/x^(1/2),x)
```

```
[Out] (2*10^(x^(1/2)))/log(10)
```

sympy [A]   time = 0.15, size = 10, normalized size = 0.48

$$\frac{2 \cdot 10^{\sqrt{x}}}{\log (10)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(10**(x**(1/2))/x**(1/2),x)
```

```
[Out] 2*10**(sqrt(x))/log(10)
```

3.744 $\int \left(\frac{1}{\sqrt{e^x+x}}+\frac{e^x}{\sqrt{e^x+x}}\right) dx$

Optimal. Leaf size=11

$$2\sqrt{x+e^x}$$

[Out] 2*(x+exp(x))^(1/2)

Rubi [A] time = 0.04, antiderivative size = 11, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 1, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.043, Rules used = {2261}

$$2\sqrt{x+e^x}$$

Antiderivative was successfully verified.

[In] Int[1/Sqrt[E^x + x] + E^x/Sqrt[E^x + x],x]

[Out] 2*Sqrt[E^x + x]

Rule 2261

```
Int[(F_)^((e_.)*((c_.) + (d_.)*(x_)))*((b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_
))) + (a_.)*(x_)^(n_.))^(p_.), x_Symbol] :> Simp[(a*x^n + b*F^(e*(c + d*x))
)^(p + 1)/(b*d*e*(p + 1)*Log[F]), x] - Dist[(a*n)/(b*d*e*Log[F]), Int[x^(n
- 1)*(a*x^n + b*F^(e*(c + d*x)))^p, x], x] /; FreeQ[{F, a, b, c, d, e, n, p
}, x] && NeQ[p, -1]
```

Rubi steps

$$\begin{aligned}\int \left(\frac{1}{\sqrt{e^x+x}}+\frac{e^x}{\sqrt{e^x+x}}\right) dx &= \int \frac{1}{\sqrt{e^x+x}}\, dx+\int \frac{e^x}{\sqrt{e^x+x}}\, dx\\ &= 2\sqrt{e^x+x}\end{aligned}$$

Mathematica [A] time = 0.01, size = 11, normalized size = 1.00

$$2\sqrt{x+e^x}$$

Antiderivative was successfully verified.

[In] Integrate[1/Sqrt[E^x + x] + E^x/Sqrt[E^x + x],x]

[Out] 2*Sqrt[E^x + x]

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(x+exp(x))^(1/2)+1/(x+exp(x))^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (has polynomial part)
```

giac [A] time = 0.23, size = 8, normalized size = 0.73

$$2\sqrt{x+e^x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(x+exp(x))^(1/2)+1/(x+exp(x))^(1/2),x, algorithm="giac")
```

```
[Out] 2*sqrt(x + e^x)
```

maple [A] time = 0.05, size = 9, normalized size = 0.82

$$2\sqrt{x+\mathrm{e}^x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(x+exp(x))^(1/2)+1/(x+exp(x))^(1/2),x)
```

```
[Out] 2*(x+exp(x))^(1/2)
```

maxima [A] time = 1.31, size = 8, normalized size = 0.73

$$2\sqrt{x+e^x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(x+exp(x))^(1/2)+1/(x+exp(x))^(1/2),x, algorithm="maxima")
```

```
[Out] 2*sqrt(x + e^x)
```

mupad [B] time = 3.45, size = 8, normalized size = 0.73

$$2\sqrt{x+\mathrm{e}^x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x + exp(x))^(1/2) + exp(x)/(x + exp(x))^(1/2),x)
```

```
[Out] 2*(x + exp(x))^(1/2)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^x + 1}{\sqrt{x + e^x}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(exp(x)+x)**(1/2)+1/(exp(x)+x)**(1/2),x)
```

```
[Out] Integral((exp(x) + 1)/sqrt(x + exp(x)), x)
```

3.745 $\int \left(\frac{(1+e^x)x}{\sqrt{e^x+x}} + 2\sqrt{e^x+x}\right) dx$

Optimal. Leaf size=12

$$2x\sqrt{x+e^x}$$

[Out] 2*x*(x+exp(x))^(1/2)

Rubi [A] time = 0.26, antiderivative size = 12, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 3, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.107, Rules used = {6742, 2273, 2262}

$$2x\sqrt{x+e^x}$$

Antiderivative was successfully verified.

[In] Int[((1 + E^x)*x)/Sqrt[E^x + x] + 2*Sqrt[E^x + x],x]

[Out] 2*x*Sqrt[E^x + x]

Rule 2262

```
Int[(F_)^((e_.)*((c_.) + (d_.)*(x_)))*(x_)^(m_.)*((b_.)*(F_)^((e_.)*((c_.)
+ (d_.)*(x_))) + (a_.)*(x_)^(n_.))^(p_.), x_Symbol] :> Simp[(x^m*(a*x^n + b
*F^(e*(c + d*x)))^(p + 1))/(b*d*e*(p + 1)*Log[F]), x] + (-Dist[m/(b*d*e*(p
+ 1)*Log[F]), Int[x^(m - 1)*(a*x^n + b*F^(e*(c + d*x)))^(p + 1), x], x] - D
ist[(a*n)/(b*d*e*Log[F]), Int[x^(m + n - 1)*(a*x^n + b*F^(e*(c + d*x)))^p,
x], x]) /; FreeQ[{F, a, b, c, d, e, m, n, p}, x] && NeQ[p, -1]
```

Rule 2273

```
Int[(x_)^(m_.)*(E^(x_) + (x_)^(m_.))^(n_), x_Symbol] :> -Simp[(E^x + x^m)^(
n + 1)/(n + 1), x] + (Dist[m, Int[x^(m - 1)*(E^x + x^m)^n, x], x] + Int[(E^
x + x^m)^(n + 1), x]) /; RationalQ[m, n] && GtQ[m, 0] && LtQ[n, 0] && NeQ[n
, -1]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\begin{aligned}\int \left(\frac{(1+e^x)\,x}{\sqrt{e^x+x}}+2\sqrt{e^x+x}\right)dx &= 2\int \sqrt{e^x+x}\,dx+\int \frac{(1+e^x)\,x}{\sqrt{e^x+x}}\,dx\\ &= 2\int \sqrt{e^x+x}\,dx+\int \left(\frac{x}{\sqrt{e^x+x}}+\frac{e^x x}{\sqrt{e^x+x}}\right)dx\\ &= 2\int \sqrt{e^x+x}\,dx+\int \frac{x}{\sqrt{e^x+x}}\,dx+\int \frac{e^x x}{\sqrt{e^x+x}}\,dx\\ &= -2\sqrt{e^x+x}+2x\sqrt{e^x+x}+\int \frac{1}{\sqrt{e^x+x}}\,dx-\int \frac{x}{\sqrt{e^x+x}}\,dx+\int \sqrt{e^x+x}\,dx\\ &= 2x\sqrt{e^x+x}\end{aligned}$$

Mathematica [A] time = 0.10, size = 12, normalized size = 1.00

$$2x\sqrt{x+e^x}$$

Antiderivative was successfully verified.

```
[In] Integrate[((1 + E^x)*x)/Sqrt[E^x + x] + 2*Sqrt[E^x + x],x]
```

```
[Out] 2*x*Sqrt[E^x + x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+exp(x))*x/(x+exp(x))^(1/2)+2*(x+exp(x))^(1/2),x, algorithm="fr
icas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (has polynomial part)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x(e^x+1)}{\sqrt{x+e^x}}+2\sqrt{x+e^x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+exp(x))*x/(x+exp(x))^(1/2)+2*(x+exp(x))^(1/2),x, algorithm="gi
ac")
```

```
[Out] integrate(x*(e^x + 1)/sqrt(x + e^x) + 2*sqrt(x + e^x), x)
```

maple [A] time = 0.06, size = 10, normalized size = 0.83

$$2\sqrt{x+\mathrm{e}^{x}}\, x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(x)+1)*x/(x+exp(x))^(1/2)+2*(x+exp(x))^(1/2),x)
```

```
[Out] 2*x*(x+exp(x))^(1/2)
```

maxima [A] time = 1.24, size = 16, normalized size = 1.33

$$\frac{2\left(x^{2}+xe^{x}\right)}{\sqrt{x+e^{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+exp(x))*x/(x+exp(x))^(1/2)+2*(x+exp(x))^(1/2),x, algorithm="ma
xima")
```

```
[Out] 2*(x^2 + x*e^x)/sqrt(x + e^x)
```

mupad [B] time = 3.63, size = 9, normalized size = 0.75

$$2\,x\,\sqrt{x+\mathrm{e}^{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2*(x + exp(x))^(1/2) + (x*(exp(x) + 1))/(x + exp(x))^(1/2),x)
```

```
[Out] 2*x*(x + exp(x))^(1/2)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{xe^{x}+3x+2e^{x}}{\sqrt{x+e^{x}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+exp(x))*x/(exp(x)+x)**(1/2)+2*(exp(x)+x)**(1/2),x)
```

```
[Out] Integral((x*exp(x) + 3*x + 2*exp(x))/sqrt(x + exp(x)), x)
```

3.746 $\int \left(\frac{x}{\sqrt{e^x+x}}+\frac{e^x x}{\sqrt{e^x+x}}+2\sqrt{e^x+x}\right) dx$

Optimal. Leaf size=12

$$2x\sqrt{x+e^x}$$

[Out] 2*x*(x+exp(x))^(1/2)

Rubi [A] time = 0.13, antiderivative size = 12, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.054, Rules used = {2273, 2262}

$$2x\sqrt{x+e^x}$$

Antiderivative was successfully verified.

[In] Int[x/Sqrt[E^x + x] + (E^x*x)/Sqrt[E^x + x] + 2*Sqrt[E^x + x],x]

[Out] 2*x*Sqrt[E^x + x]

Rule 2262

```
Int[(F_)^((e_.)*((c_.) + (d_.)*(x_)))*(x_)^(m_.)*((b_.)*(F_)^((e_.)*((c_.)
+ (d_.)*(x_))) + (a_.)*(x_)^(n_.))^(p_.), x_Symbol] :> Simp[(x^m*(a*x^n + b
*F^(e*(c + d*x)))^(p + 1))/(b*d*e*(p + 1)*Log[F]), x] + (-Dist[m/(b*d*e*(p
+ 1)*Log[F]), Int[x^(m - 1)*(a*x^n + b*F^(e*(c + d*x)))^(p + 1), x], x] - D
ist[(a*n)/(b*d*e*Log[F]), Int[x^(m + n - 1)*(a*x^n + b*F^(e*(c + d*x)))^p,
x], x]) /; FreeQ[{F, a, b, c, d, e, m, n, p}, x] && NeQ[p, -1]
```

Rule 2273

```
Int[(x_)^(m_.)*(E^(x_) + (x_)^(m_.))^(n_), x_Symbol] :> -Simp[(E^x + x^m)^(
n + 1)/(n + 1), x] + (Dist[m, Int[x^(m - 1)*(E^x + x^m)^n, x], x] + Int[(E^
x + x^m)^(n + 1), x]) /; RationalQ[m, n] && GtQ[m, 0] && LtQ[n, 0] && NeQ[n
, -1]
```

Rubi steps

$$\begin{aligned}\int \left(\frac{x}{\sqrt{e^x+x}}+\frac{e^x x}{\sqrt{e^x+x}}+2\sqrt{e^x+x}\right) dx &= 2\int \sqrt{e^x+x}\,dx+\int \frac{x}{\sqrt{e^x+x}}\,dx+\int \frac{e^x x}{\sqrt{e^x+x}}\,dx\\ &= -2\sqrt{e^x+x}+2x\sqrt{e^x+x}+\int \frac{1}{\sqrt{e^x+x}}\,dx-\int \frac{x}{\sqrt{e^x+x}}\,dx+\int \sqrt{e^x\\ &= 2x\sqrt{e^x+x}\end{aligned}$$

Mathematica [A] time = 0.05, size = 12, normalized size = 1.00

$$2x\sqrt{x+e^x}$$

Antiderivative was successfully verified.

```
[In] Integrate[x/Sqrt[E^x + x] + (E^x*x)/Sqrt[E^x + x] + 2*Sqrt[E^x + x],x]
```

```
[Out] 2*x*Sqrt[E^x + x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(x+exp(x))^(1/2)+exp(x)*x/(x+exp(x))^(1/2)+2*(x+exp(x))^(1/2),x
, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (has polynomial part)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{xe^x}{\sqrt{x+e^x}} + 2\sqrt{x+e^x} + \frac{x}{\sqrt{x+e^x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(x+exp(x))^(1/2)+exp(x)*x/(x+exp(x))^(1/2)+2*(x+exp(x))^(1/2),x
, algorithm="giac")
```

```
[Out] integrate(x*e^x/sqrt(x + e^x) + 2*sqrt(x + e^x) + x/sqrt(x + e^x), x)
```

maple [A] time = 0.05, size = 10, normalized size = 0.83

$$2\sqrt{x+e^x}\,x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(x+exp(x))^(1/2)+exp(x)*x/(x+exp(x))^(1/2)+2*(x+exp(x))^(1/2),x)
```

```
[Out] 2*(x+exp(x))^(1/2)*x
```

maxima [A] time = 1.16, size = 9, normalized size = 0.75

$$2\sqrt{x+e^x}\,x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(x+exp(x))^(1/2)+exp(x)*x/(x+exp(x))^(1/2)+2*(x+exp(x))^(1/2),x
, algorithm="maxima")
```

```
[Out] 2*sqrt(x + e^x)*x
```

mupad [B] time = 3.35, size = 9, normalized size = 0.75

$$2\,x\,\sqrt{x+{\mathrm{e}}^x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2*(x + exp(x))^(1/2) + x/(x + exp(x))^(1/2) + (x*exp(x))/(x + exp(x))^(
1/2),x)
```

```
[Out] 2*x*(x + exp(x))^(1/2)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{xe^{x} + 3x + 2e^{x}}{\sqrt{x + e^{x}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(exp(x)+x)**(1/2)+exp(x)*x/(exp(x)+x)**(1/2)+2*(exp(x)+x)**(1/2
),x)
```

```
[Out] Integral((x*exp(x) + 3*x + 2*exp(x))/sqrt(x + exp(x)), x)
```

3.747 $\int \frac{(1+e^x)x}{\sqrt{e^x+x}}\,dx$

Optimal. Leaf size=27

$$2x\sqrt{x+e^x} - 2\text{Int}\left(\sqrt{x+e^x}, x\right)$$

```
[Out] -2*CannotIntegrate((x+exp(x))^(1/2),x)+2*x*(x+exp(x))^(1/2)
```

Rubi [A] time = 0.18, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(1+e^x)\,x}{\sqrt{e^x+x}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[((1 + E^x)*x)/Sqrt[E^x + x],x]
```

```
[Out] 2*x*Sqrt[E^x + x] - 2*Defer[Int][Sqrt[E^x + x], x]
```

Rubi steps

$$\begin{aligned}
\int \frac{(1+e^x)\,x}{\sqrt{e^x+x}}\,dx &= \int \left(\frac{x}{\sqrt{e^x+x}}+\frac{e^x x}{\sqrt{e^x+x}}\right)dx\\
&= \int \frac{x}{\sqrt{e^x+x}}\,dx+\int \frac{e^x x}{\sqrt{e^x+x}}\,dx\\
&= -2\sqrt{e^x+x}+2x\sqrt{e^x+x}-2\int \sqrt{e^x+x}\,dx+\int \frac{1}{\sqrt{e^x+x}}\,dx-\int \frac{x}{\sqrt{e^x+x}}\,dx+\int \sqrt{e^x+x}\,d\\
&= 2x\sqrt{e^x+x}-2\int \sqrt{e^x+x}\,dx
\end{aligned}$$

Mathematica [A] time = 0.16, size = 0, normalized size = 0.00

$$\int \frac{(1+e^x)\,x}{\sqrt{e^x+x}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[((1 + E^x)*x)/Sqrt[E^x + x],x]
```

```
[Out] Integrate[((1 + E^x)*x)/Sqrt[E^x + x], x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+exp(x))*x/(x+exp(x))^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (has polynomial part)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x(e^x+1)}{\sqrt{x+e^x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+exp(x))*x/(x+exp(x))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(x*(e^x + 1)/sqrt(x + e^x), x)
```

maple [A] time = 0.04, size = 0, normalized size = 0.00

$$\int \frac{(e^x+1)\,x}{\sqrt{x+e^x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((exp(x)+1)*x/(x+exp(x))^(1/2),x)
```

```
[Out] int((exp(x)+1)*x/(x+exp(x))^(1/2),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x(e^x+1)}{\sqrt{x+e^x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+exp(x))*x/(x+exp(x))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(x*(e^x + 1)/sqrt(x + e^x), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x\,\left(e^x+1\right)}{\sqrt{x+e^x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(exp(x) + 1))/(x + exp(x))^(1/2),x)
```

```
[Out] int((x*(exp(x) + 1))/(x + exp(x))^(1/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x\left(e^{x}+1\right)}{\sqrt{x+e^{x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+exp(x))*x/(exp(x)+x)**(1/2),x)
```

```
[Out] Integral(x*(exp(x) + 1)/sqrt(x + exp(x)), x)
```

3.748 $\int \left(\frac{x}{\sqrt{e^x+x}}+\frac{e^x x}{\sqrt{e^x+x}}\right) dx$

Optimal. Leaf size=27

$$2x\sqrt{x+e^x}-2\text{Int}\left(\sqrt{x+e^x},x\right)$$

```
[Out] -2*CannotIntegrate((x+exp(x))^(1/2),x)+2*x*(x+exp(x))^(1/2)
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \left(\frac{x}{\sqrt{e^x+x}}+\frac{e^x x}{\sqrt{e^x+x}}\right) dx$$

Verification is Not applicable to the result.

```
[In] Int[x/Sqrt[E^x + x] + (E^x*x)/Sqrt[E^x + x],x]
```

```
[Out] 2*x*Sqrt[E^x + x] - 2*Defer[Int][Sqrt[E^x + x], x]
```

Rubi steps

$$\begin{aligned}
\int \left(\frac{x}{\sqrt{e^x+x}}+\frac{e^x x}{\sqrt{e^x+x}}\right) dx &= \int \frac{x}{\sqrt{e^x+x}}\,dx+\int \frac{e^x x}{\sqrt{e^x+x}}\,dx\\
&= -2\sqrt{e^x+x}+2x\sqrt{e^x+x}-2\int \sqrt{e^x+x}\,dx+\int \frac{1}{\sqrt{e^x+x}}\,dx-\int \frac{x}{\sqrt{e^x+x}}\,dx+\int\\
&= 2x\sqrt{e^x+x}-2\int \sqrt{e^x+x}\,dx
\end{aligned}$$

Mathematica [A] time = 0.07, size = 0, normalized size = 0.00

$$\int \left(\frac{x}{\sqrt{e^x+x}}+\frac{e^x x}{\sqrt{e^x+x}}\right) dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x/Sqrt[E^x + x] + (E^x*x)/Sqrt[E^x + x],x]
```

```
[Out] Integrate[x/Sqrt[E^x + x] + (E^x*x)/Sqrt[E^x + x], x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(x+exp(x))^(1/2)+exp(x)*x/(x+exp(x))^(1/2),x, algorithm="fricas
")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (has polynomial part)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{xe^{x}}{\sqrt{x+e^{x}}}+\frac{x}{\sqrt{x+e^{x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(x+exp(x))^(1/2)+exp(x)*x/(x+exp(x))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(x*e^x/sqrt(x + e^x) + x/sqrt(x + e^x), x)
```

maple [A] time = 0.04, size = 0, normalized size = 0.00

$$\int \frac{x\,\mathrm{e}^{x}}{\sqrt{x+\mathrm{e}^{x}}}+\frac{x}{\sqrt{x+\mathrm{e}^{x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(x+exp(x))^(1/2)+exp(x)*x/(x+exp(x))^(1/2),x)
```

```
[Out] int(x/(x+exp(x))^(1/2)+exp(x)*x/(x+exp(x))^(1/2),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{xe^{x}}{\sqrt{x+e^{x}}}+\frac{x}{\sqrt{x+e^{x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(x+exp(x))^(1/2)+exp(x)*x/(x+exp(x))^(1/2),x, algorithm="maxima
")
```

```
[Out] integrate(x*e^x/sqrt(x + e^x) + x/sqrt(x + e^x), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x}{\sqrt{x+\mathrm{e}^{x}}}+\frac{x\,\mathrm{e}^{x}}{\sqrt{x+\mathrm{e}^{x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(x + exp(x))^(1/2) + (x*exp(x))/(x + exp(x))^(1/2),x)
```

```
[Out] int(x/(x + exp(x))^(1/2) + (x*exp(x))/(x + exp(x))^(1/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x\,(e^{x}+1)}{\sqrt{x+e^{x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(exp(x)+x)**(1/2)+exp(x)*x/(exp(x)+x)**(1/2),x)
```

```
[Out] Integral(x*(exp(x) + 1)/sqrt(x + exp(x)), x)
```

3.749 $\int \frac{e^x x}{\sqrt{e^x+x}}\,dx$

Optimal. Leaf size=52

$$-\text{Int}\left(\frac{1}{\sqrt{x+e^x}},x\right)-3\text{Int}\left(\sqrt{x+e^x},x\right)+2\sqrt{x+e^x}\,x+2\sqrt{x+e^x}$$

```
[Out] -CannotIntegrate(1/(x+exp(x))^(1/2),x)-3*CannotIntegrate((x+exp(x))^(1/2),x
)+2*(x+exp(x))^(1/2)+2*x*(x+exp(x))^(1/2)
```

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{e^x x}{\sqrt{e^x+x}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(E^x*x)/Sqrt[E^x + x],x]
```

```
[Out] 2*Sqrt[E^x + x] + 2*x*Sqrt[E^x + x] - Defer[Int][1/Sqrt[E^x + x], x] - 3*De
fer[Int][Sqrt[E^x + x], x]
```

Rubi steps

$$\begin{aligned}\int \frac{e^x x}{\sqrt{e^x+x}}\,dx &= 2x\sqrt{e^x+x}-2\int \sqrt{e^x+x}\,dx-\int \frac{x}{\sqrt{e^x+x}}\,dx\\ &= 2\sqrt{e^x+x}+2x\sqrt{e^x+x}-2\int \sqrt{e^x+x}\,dx-\int \frac{1}{\sqrt{e^x+x}}\,dx-\int \sqrt{e^x+x}\,dx\end{aligned}$$

Mathematica [A] time = 0.10, size = 0, normalized size = 0.00

$$\int \frac{e^x x}{\sqrt{e^x+x}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(E^x*x)/Sqrt[E^x + x],x]
```

```
[Out] Integrate[(E^x*x)/Sqrt[E^x + x], x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*x/(x+exp(x))^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (has polynomial part)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{xe^x}{\sqrt{x+e^x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*x/(x+exp(x))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(x*e^x/sqrt(x + e^x), x)
```

maple [A] time = 0.04, size = 0, normalized size = 0.00

$$\int \frac{x\,\mathrm{e}^{x}}{\sqrt{x+\mathrm{e}^{x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x+exp(x))^(1/2)*x*exp(x),x)
```

```
[Out] int(1/(x+exp(x))^(1/2)*x*exp(x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{xe^x}{\sqrt{x+e^x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*x/(x+exp(x))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(x*e^x/sqrt(x + e^x), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{x\,\mathrm{e}^{x}}{\sqrt{x+\mathrm{e}^{x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*exp(x))/(x + exp(x))^(1/2),x)
```

```
[Out] int((x*exp(x))/(x + exp(x))^(1/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{xe^x}{\sqrt{x+e^x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*x/(exp(x)+x)**(1/2),x)
```

```
[Out] Integral(x*exp(x)/sqrt(x + exp(x)), x)
```

3.750 $\int \left(\frac{x^2(5e^x+3x^2)}{5\sqrt{5e^x+x^3}}+\frac{4}{5}x\sqrt{5e^x+x^3}\right)dx$

Optimal. Leaf size=20

$$\frac{2}{5}x^2\sqrt{x^3+5e^x}$$

```
[Out] 2/5*x^2*(5*exp(x)+x^3)^(1/2)
```

Rubi [A] time = 0.60, antiderivative size = 20, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 50, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.040, Rules used = {6742, 2262}

$$\frac{2}{5}x^2\sqrt{x^3+5e^x}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(5*E^x + 3*x^2))/(5*Sqrt[5*E^x + x^3]) + (4*x*Sqrt[5*E^x + x^3])/5
,x]
```

```
[Out] (2*x^2*Sqrt[5*E^x + x^3])/5
```

Rule 2262

```
Int[(F_)^((e_.)*((c_.) + (d_.)*(x_)))*(x_)^(m_.)*((b_.)*(F_)^((e_.)*((c_.)
+ (d_.)*(x_))) + (a_.)*(x_)^(n_.))^(p_.), x_Symbol] :> Simp[(x^m*(a*x^n + b
*F^(e*(c + d*x)))^(p + 1))/(b*d*e*(p + 1)*Log[F]), x] + (-Dist[m/(b*d*e*(p
+ 1)*Log[F]), Int[x^(m - 1)*(a*x^n + b*F^(e*(c + d*x)))^(p + 1), x], x] - D
ist[(a*n)/(b*d*e*Log[F]), Int[x^(m + n - 1)*(a*x^n + b*F^(e*(c + d*x)))^p,
x], x]) /; FreeQ[{F, a, b, c, d, e, m, n, p}, x] && NeQ[p, -1]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\begin{aligned}\int\left(\frac{x^2\left(5e^x+3x^2\right)}{5\sqrt{5e^x+x^3}}+\frac{4}{5}x\sqrt{5e^x+x^3}\right)dx&=\frac{1}{5}\int\frac{x^2\left(5e^x+3x^2\right)}{\sqrt{5e^x+x^3}}dx+\frac{4}{5}\int x\sqrt{5e^x+x^3}\,dx\\&=\frac{1}{5}\int\left(\frac{5e^xx^2}{\sqrt{5e^x+x^3}}+\frac{3x^4}{\sqrt{5e^x+x^3}}\right)dx+\frac{4}{5}\int x\sqrt{5e^x+x^3}\,dx\\&=\frac{3}{5}\int\frac{x^4}{\sqrt{5e^x+x^3}}dx+\frac{4}{5}\int x\sqrt{5e^x+x^3}\,dx+\int\frac{e^xx^2}{\sqrt{5e^x+x^3}}dx\\&=\frac{2}{5}x^2\sqrt{5e^x+x^3}\end{aligned}$$

Mathematica [A] time = 0.17, size = 20, normalized size = 1.00

$$\frac{2}{5}x^2\sqrt{x^3+5e^x}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(5*E^x + 3*x^2))/(5*Sqrt[5*E^x + x^3]) + (4*x*Sqrt[5*E^x + x
^3])/5,x]
```

```
[Out] (2*x^2*Sqrt[5*E^x + x^3])/5
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/5*x^2*(5*exp(x)+3*x^2)/(5*exp(x)+x^3)^(1/2)+4/5*x*(5*exp(x)+x^3
)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (has polynomial part)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(3\,x^2+5\,e^x\right)x^2}{5\,\sqrt{x^3+5\,e^x}}+\frac{4}{5}\,\sqrt{x^3+5\,e^x}\,x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/5*x^2*(5*exp(x)+3*x^2)/(5*exp(x)+x^3)^(1/2)+4/5*x*(5*exp(x)+x^3
)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(1/5*(3*x^2 + 5*e^x)*x^2/sqrt(x^3 + 5*e^x) + 4/5*sqrt(x^3 + 5*e^x)
*x, x)
```

maple [A] time = 0.07, size = 16, normalized size = 0.80

$$\frac{2\sqrt{x^3+5\,\mathrm{e}^x}\;x^2}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/5*x^2*(5*exp(x)+3*x^2)/(5*exp(x)+x^3)^(1/2)+4/5*x*(5*exp(x)+x^3)^(1/2
),x)
```

```
[Out] 2/5*x^2*(5*exp(x)+x^3)^(1/2)
```

maxima [A] time = 1.31, size = 23, normalized size = 1.15

$$\frac{2\left(x^5+5\,x^2e^x\right)}{5\sqrt{x^3+5\,e^x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/5*x^2*(5*exp(x)+3*x^2)/(5*exp(x)+x^3)^(1/2)+4/5*x*(5*exp(x)+x^3
)^(1/2),x, algorithm="maxima")
```

```
[Out] 2/5*(x^5 + 5*x^2*e^x)/sqrt(x^3 + 5*e^x)
```

mupad [B] time = 3.69, size = 15, normalized size = 0.75

$$\frac{2\,x^2\,\sqrt{5\,\mathrm{e}^x+x^3}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((4*x*(5*exp(x) + x^3)^(1/2))/5 + (x^2*(5*exp(x) + 3*x^2))/(5*(5*exp(x)
+ x^3)^(1/2)),x)
```

```
[Out] (2*x^2*(5*exp(x) + x^3)^(1/2))/5
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int\frac{7x^4}{\sqrt{x^3+5e^x}}\,dx+\int\frac{20xe^x}{\sqrt{x^3+5e^x}}\,dx+\int\frac{5x^2e^x}{\sqrt{x^3+5e^x}}\,dx}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/5*x**2*(5*exp(x)+3*x**2)/(5*exp(x)+x**3)**(1/2)+4/5*x*(5*exp(x)
+x**3)**(1/2),x)
```

```
[Out] (Integral(7*x**4/sqrt(x**3 + 5*exp(x)), x) + Integral(20*x*exp(x)/sqrt(x**3
 + 5*exp(x)), x) + Integral(5*x**2*exp(x)/sqrt(x**3 + 5*exp(x)), x))/5
```

3.751 $\int \frac{e^x x^2}{\sqrt{5e^x+x^3}}\,dx$

Optimal. Leaf size=67

$$-\frac{4}{5}\text{Int}\left(x\sqrt{x^3+5e^x},x\right)-\frac{3}{5}\text{Int}\left(\frac{x^4}{\sqrt{x^3+5e^x}},x\right)+\frac{2}{5}\sqrt{x^3+5e^x}\,x^2$$

```
[Out] -3/5*CannotIntegrate(x^4/(5*exp(x)+x^3)^(1/2),x)-4/5*CannotIntegrate(x*(5*e
xp(x)+x^3)^(1/2),x)+2/5*x^2*(5*exp(x)+x^3)^(1/2)
```

Rubi [A] time = 0.17, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{e^x x^2}{\sqrt{5e^x+x^3}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(E^x*x^2)/Sqrt[5*E^x + x^3],x]
```

```
[Out] (2*x^2*Sqrt[5*E^x + x^3])/5 - (3*Defer[Int][x^4/Sqrt[5*E^x + x^3], x])/5 -
(4*Defer[Int][x*Sqrt[5*E^x + x^3], x])/5
```

Rubi steps

$$\int \frac{e^x x^2}{\sqrt{5e^x+x^3}}\,dx=\frac{2}{5}x^2\sqrt{5e^x+x^3}-\frac{3}{5}\int \frac{x^4}{\sqrt{5e^x+x^3}}\,dx-\frac{4}{5}\int x\sqrt{5e^x+x^3}\,dx$$

Mathematica [A] time = 0.19, size = 0, normalized size = 0.00

$$\int \frac{e^x x^2}{\sqrt{5e^x+x^3}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(E^x*x^2)/Sqrt[5*E^x + x^3],x]
```

```
[Out] Integrate[(E^x*x^2)/Sqrt[5*E^x + x^3], x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*x^2/(5*exp(x)+x^3)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (has polynomial part)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2 e^x}{\sqrt{x^3 + 5 e^x}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*x^2/(5*exp(x)+x^3)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(x^2*e^x/sqrt(x^3 + 5*e^x), x)
```

maple [A] time = 0.05, size = 0, normalized size = 0.00

$$\int \frac{x^2 \mathrm{e}^x}{\sqrt{x^3 + 5 \mathrm{e}^x}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*x^2/(x^3+5*exp(x))^(1/2),x)
```

```
[Out] int(exp(x)*x^2/(x^3+5*exp(x))^(1/2),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2 e^x}{\sqrt{x^3 + 5 e^x}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*x^2/(5*exp(x)+x^3)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(x^2*e^x/sqrt(x^3 + 5*e^x), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2 \, \mathrm{e}^x}{\sqrt{5 \, \mathrm{e}^x + x^3}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*exp(x))/(5*exp(x) + x^3)^(1/2),x)
```

```
[Out] int((x^2*exp(x))/(5*exp(x) + x^3)^(1/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2 e^x}{\sqrt{x^3 + 5e^x}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*x**2/(5*exp(x)+x**3)**(1/2),x)
```

```
[Out] Integral(x**2*exp(x)/sqrt(x**3 + 5*exp(x)), x)
```

3.752 $\int -\frac{1+e^x}{\sqrt[3]{e^x+x}}\,dx$

Optimal. Leaf size=13

$$-\frac{3}{2}\left(x+e^x\right)^{2/3}$$

```
[Out] -3/2*(x+exp(x))^(2/3)
```

Rubi [A] time = 0.02, antiderivative size = 13, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.062, Rules used = {6686}

$$-\frac{3}{2}\left(x+e^x\right)^{2/3}$$

Antiderivative was successfully verified.

```
[In] Int[-((1 + E^x)/(E^x + x)^(1/3)),x]
```

```
[Out] (-3*(E^x + x)^(2/3))/2
```

Rule 6686

```
Int[(u_)*(y_)^(m_.), x_Symbol] :> With[{q = DerivativeDivides[y, u, x]}, Si
mp[(q*y^(m + 1))/(m + 1), x] /;  !FalseQ[q]] /; FreeQ[m, x] && NeQ[m, -1]
```

Rubi steps

$$\int -\frac{1+e^x}{\sqrt[3]{e^x+x}}\,dx=-\frac{3}{2}\left(e^x+x\right)^{2/3}$$

Mathematica [A] time = 0.01, size = 13, normalized size = 1.00

$$-\frac{3}{2}\left(x+e^x\right)^{2/3}$$

Antiderivative was successfully verified.

```
[In] Integrate[-((1 + E^x)/(E^x + x)^(1/3)),x]
```

```
[Out] (-3*(E^x + x)^(2/3))/2
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-1-exp(x))/(x+exp(x))^(1/3),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (has polynomial part)
```

giac [A] time = 0.21, size = 8, normalized size = 0.62

$$-\frac{3}{2}\,(x+e^x)^{\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-1-exp(x))/(x+exp(x))^(1/3),x, algorithm="giac")
```

```
[Out] -3/2*(x + e^x)^(2/3)
```

maple [A] time = 0.04, size = 9, normalized size = 0.69

$$-\frac{3\,(x+e^x)^{\frac{2}{3}}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-1-exp(x))/(x+exp(x))^(1/3),x)
```

```
[Out] -3/2*(x+exp(x))^(2/3)
```

maxima [A] time = 0.58, size = 8, normalized size = 0.62

$$-\frac{3}{2}\,(x+e^x)^{\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-1-exp(x))/(x+exp(x))^(1/3),x, algorithm="maxima")
```

```
[Out] -3/2*(x + e^x)^(2/3)
```

mupad [B] time = 3.37, size = 8, normalized size = 0.62

$$-\frac{3\,(x+e^x)^{2/3}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-(exp(x) + 1)/(x + exp(x))^(1/3),x)
```

```
[Out] -(3*(x + exp(x))^(2/3))/2
```

sympy [A] time = 0.22, size = 12, normalized size = 0.92

$$-\frac{3\left(x+e^{x}\right)^{\frac{2}{3}}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-1-exp(x))/(exp(x)+x)**(1/3),x)
[Out] -3*(x + exp(x))**(2/3)/2
```

3.753 $\int \left(-\frac{1}{\sqrt[3]{e^x+x}}+\frac{x}{\sqrt[3]{e^x+x}}-(e^x+x)^{2/3}\right) dx$

Optimal. Leaf size=13

$$-\frac{3}{2}(x+e^x)^{2/3}$$

```
[Out] -3/2*(x+exp(x))^(2/3)
```

Rubi [A] time = 0.07, antiderivative size = 13, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 1, integrand size = 34, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.029, Rules used = {2273}

$$-\frac{3}{2}(x+e^x)^{2/3}$$

Antiderivative was successfully verified.

```
[In] Int[-(E^x + x)^(-1/3) + x/(E^x + x)^(1/3) - (E^x + x)^(2/3),x]
```

```
[Out] (-3*(E^x + x)^(2/3))/2
```

Rule 2273

```
Int[(x_)^(m_.)*(E^(x_) + (x_)^(m_.))^(n_), x_Symbol] :> -Simp[(E^x + x^m)^(
n + 1)/(n + 1), x] + (Dist[m, Int[x^(m - 1)*(E^x + x^m)^n, x], x] + Int[(E^
x + x^m)^(n + 1), x]) /; RationalQ[m, n] && GtQ[m, 0] && LtQ[n, 0] && NeQ[n
, -1]
```

Rubi steps

$$\begin{aligned}\int \left(-\frac{1}{\sqrt[3]{e^x+x}}+\frac{x}{\sqrt[3]{e^x+x}}-(e^x+x)^{2/3}\right) dx &= -\int \frac{1}{\sqrt[3]{e^x+x}}\,dx+\int \frac{x}{\sqrt[3]{e^x+x}}\,dx-\int (e^x+x)^{2/3}\,dx\\ &= -\frac{3}{2}(e^x+x)^{2/3}\end{aligned}$$

Mathematica [A] time = 0.00, size = 13, normalized size = 1.00

$$-\frac{3}{2}(x+e^x)^{2/3}$$

Antiderivative was successfully verified.

```
[In] Integrate[-(E^x + x)^(-1/3) + x/(E^x + x)^(1/3) - (E^x + x)^(2/3),x]
```

```
[Out] (-3*(E^x + x)^(2/3))/2
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(-1/(x+exp(x))^(1/3)+x/(x+exp(x))^(1/3)-(x+exp(x))^(2/3),x, algori
thm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (has polynomial part)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int -(x+e^x)^{\frac{2}{3}} + \frac{x}{(x+e^x)^{\frac{1}{3}}} - \frac{1}{(x+e^x)^{\frac{1}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(-1/(x+exp(x))^(1/3)+x/(x+exp(x))^(1/3)-(x+exp(x))^(2/3),x, algori
thm="giac")
```

```
[Out] integrate(-(x + e^x)^(2/3) + x/(x + e^x)^(1/3) - 1/(x + e^x)^(1/3), x)
```

maple [A] time = 0.06, size = 9, normalized size = 0.69

$$-\frac{3\,(x+e^x)^{\frac{2}{3}}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-1/(x+exp(x))^(1/3)+x/(x+exp(x))^(1/3)-(x+exp(x))^(2/3),x)
```

```
[Out] -3/2*(x+exp(x))^(2/3)
```

maxima [A] time = 1.20, size = 8, normalized size = 0.62

$$-\frac{3}{2}\,(x+e^x)^{\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(-1/(x+exp(x))^(1/3)+x/(x+exp(x))^(1/3)-(x+exp(x))^(2/3),x, algori
thm="maxima")
```

```
[Out] -3/2*(x + e^x)^(2/3)
```

mupad [B] time = 3.38, size = 8, normalized size = 0.62

$$-\frac{3\,{\left(x+{\mathrm{e}}^x\right)}^{2/3}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(x + exp(x))^(1/3) - (x + exp(x))^(2/3) - 1/(x + exp(x))^(1/3),x)
```

```
[Out] -(3*(x + exp(x))^(2/3))/2
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\int \frac{e^{x}}{\sqrt[3]{x+e^{x}}}\, dx - \int \frac{1}{\sqrt[3]{x+e^{x}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(-1/(exp(x)+x)**(1/3)+x/(exp(x)+x)**(1/3)-(exp(x)+x)**(2/3),x)
```

```
[Out] -Integral(exp(x)/(x + exp(x))**(1/3), x) - Integral((x + exp(x))**(-1/3), x
)
```

3.754 $\int \frac{x}{\sqrt[3]{e^x+x}}\,dx$

Optimal. Leaf size=38

$$\text{Int}\left(\frac{1}{\sqrt[3]{x+e^x}},x\right)+\text{Int}\left((x+e^x)^{2/3},x\right)-\frac{3}{2}(x+e^x)^{2/3}$$

```
[Out] -3/2*(x+exp(x))^(2/3)+CannotIntegrate(1/(x+exp(x))^(1/3),x)+CannotIntegrate
((x+exp(x))^(2/3),x)
```

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x}{\sqrt[3]{e^x+x}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x/(E^x + x)^(1/3),x]
```

```
[Out] (-3*(E^x + x)^(2/3))/2 + Defer[Int][(E^x + x)^(-1/3), x] + Defer[Int][(E^x
+ x)^(2/3), x]
```

Rubi steps

$$\int \frac{x}{\sqrt[3]{e^x+x}}\,dx=-\frac{3}{2}(e^x+x)^{2/3}+\int \frac{1}{\sqrt[3]{e^x+x}}\,dx+\int (e^x+x)^{2/3}\,dx$$

Mathematica [A] time = 0.05, size = 0, normalized size = 0.00

$$\int \frac{x}{\sqrt[3]{e^x+x}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x/(E^x + x)^(1/3),x]
```

```
[Out] Integrate[x/(E^x + x)^(1/3), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(x+exp(x))^(1/3),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{(x+e^x)^{\frac{1}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(x+exp(x))^(1/3),x, algorithm="giac")
```

```
[Out] integrate(x/(x + e^x)^(1/3), x)
```

maple [A] time = 0.03, size = 0, normalized size = 0.00

$$\int \frac{x}{(x+\mathrm{e}^x)^{\frac{1}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(x+exp(x))^(1/3),x)
```

```
[Out] int(x/(x+exp(x))^(1/3),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{(x+e^x)^{\frac{1}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(x+exp(x))^(1/3),x, algorithm="maxima")
```

```
[Out] integrate(x/(x + e^x)^(1/3), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x}{(x+\mathrm{e}^x)^{1/3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(x + exp(x))^(1/3),x)
```

```
[Out] int(x/(x + exp(x))^(1/3), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{\sqrt[3]{x+e^{x}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(exp(x)+x)**(1/3),x)
```

```
[Out] Integral(x/(x + exp(x))**(1/3), x)
```

3.755 $\int \frac{5x+e^x(3+2x)}{\sqrt[3]{e^x+x}}\,dx$

Optimal. Leaf size=12

$$3x(x+e^x)^{2/3}$$

[Out] 3*x*(x+exp(x))^(2/3)

Rubi [A] time = 0.34, antiderivative size = 12, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {6742, 2273, 2261, 2262}

$$3x(x+e^x)^{2/3}$$

Antiderivative was successfully verified.

[In] Int[(5*x + E^x*(3 + 2*x))/(E^x + x)^(1/3),x]

[Out] 3*x*(E^x + x)^(2/3)

Rule 2261

```
Int[(F_)^((e_.)*((c_.) + (d_.)*(x_)))*((b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_
))) + (a_.)*(x_)^(n_.))^(p_.), x_Symbol] :> Simp[(a*x^n + b*F^(e*(c + d*x))
)^(p + 1)/(b*d*e*(p + 1)*Log[F]), x] - Dist[(a*n)/(b*d*e*Log[F]), Int[x^(n
- 1)*(a*x^n + b*F^(e*(c + d*x)))^p, x], x] /; FreeQ[{F, a, b, c, d, e, n, p
}, x] && NeQ[p, -1]
```

Rule 2262

```
Int[(F_)^((e_.)*((c_.) + (d_.)*(x_)))*(x_)^(m_.)*((b_.)*(F_)^((e_.)*((c_.)
+ (d_.)*(x_))) + (a_.)*(x_)^(n_.))^(p_.), x_Symbol] :> Simp[(x^m*(a*x^n + b
*F^(e*(c + d*x)))^(p + 1))/(b*d*e*(p + 1)*Log[F]), x] + (-Dist[m/(b*d*e*(p
+ 1)*Log[F]), Int[x^(m - 1)*(a*x^n + b*F^(e*(c + d*x)))^(p + 1), x], x] - D
ist[(a*n)/(b*d*e*Log[F]), Int[x^(m + n - 1)*(a*x^n + b*F^(e*(c + d*x)))^p,
x], x]) /; FreeQ[{F, a, b, c, d, e, m, n, p}, x] && NeQ[p, -1]
```

Rule 2273

```
Int[(x_)^(m_.)*(E^(x_) + (x_)^(m_.))^(n_), x_Symbol] :> -Simp[(E^x + x^m)^(
n + 1)/(n + 1), x] + (Dist[m, Int[x^(m - 1)*(E^x + x^m)^n, x], x] + Int[(E^
x + x^m)^(n + 1), x]) /; RationalQ[m, n] && GtQ[m, 0] && LtQ[n, 0] && NeQ[n
, -1]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$
\begin{aligned}
\int \frac{5x+e^x(3+2x)}{\sqrt[3]{e^x+x}}\,dx &= \int \left(\frac{5x}{\sqrt[3]{e^x+x}}+\frac{e^x(3+2x)}{\sqrt[3]{e^x+x}}\right)dx \\
&= 5\int \frac{x}{\sqrt[3]{e^x+x}}\,dx+\int \frac{e^x(3+2x)}{\sqrt[3]{e^x+x}}\,dx \\
&= -\frac{15}{2}\left(e^x+x\right)^{2/3}+5\int \frac{1}{\sqrt[3]{e^x+x}}\,dx+5\int \left(e^x+x\right)^{2/3}\,dx+\int \left(\frac{3e^x}{\sqrt[3]{e^x+x}}+\frac{2e^x x}{\sqrt[3]{e^x+x}}\right)dx \\
&= -\frac{15}{2}\left(e^x+x\right)^{2/3}+2\int \frac{e^x x}{\sqrt[3]{e^x+x}}\,dx+3\int \frac{e^x}{\sqrt[3]{e^x+x}}\,dx+5\int \frac{1}{\sqrt[3]{e^x+x}}\,dx+5\int \left(e^x+x\right. \\
&= -3\left(e^x+x\right)^{2/3}+3x\left(e^x+x\right)^{2/3}-2\int \frac{x}{\sqrt[3]{e^x+x}}\,dx-3\int \frac{1}{\sqrt[3]{e^x+x}}\,dx-3\int \left(e^x+x\right)^{2/3}\,d \\
&= 3x\left(e^x+x\right)^{2/3}-2\int \frac{1}{\sqrt[3]{e^x+x}}\,dx-2\int \left(e^x+x\right)^{2/3}\,dx-3\int \frac{1}{\sqrt[3]{e^x+x}}\,dx-3\int \left(e^x+x\right)
\end{aligned}
$$

Mathematica [A] time = 0.10, size = 12, normalized size = 1.00

$$3x\left(x+e^x\right)^{2/3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(5*x + E^x*(3 + 2*x))/(E^x + x)^(1/3),x]
```

```
[Out] 3*x*(E^x + x)^(2/3)
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x+exp(x)*(3+2*x))/(x+exp(x))^(1/3),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (has polynomial part)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(2\,x+3)e^x+5\,x}{(x+e^x)^{\frac{1}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x+exp(x)*(3+2*x))/(x+exp(x))^(1/3),x, algorithm="giac")
```

```
[Out] integrate(((2*x + 3)*e^x + 5*x)/(x + e^x)^(1/3), x)
```

maple [A] time = 0.04, size = 10, normalized size = 0.83

$$3\left(x+{\mathrm e}^{x}\right)^{\frac{2}{3}} x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((5*x+exp(x)*(2*x+3))/(x+exp(x))^(1/3),x)
```

```
[Out] 3*x*(x+exp(x))^(2/3)
```

maxima [A] time = 1.16, size = 16, normalized size = 1.33

$$\frac{3\left(x^{2}+xe^{x}\right)}{\left(x+e^{x}\right)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x+exp(x)*(3+2*x))/(x+exp(x))^(1/3),x, algorithm="maxima")
```

```
[Out] 3*(x^2 + x*e^x)/(x + e^x)^(1/3)
```

mupad [B] time = 3.47, size = 9, normalized size = 0.75

$$3\,x\,{\left(x+{\mathrm{e}}^x\right)}^{2/3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((5*x + exp(x)*(2*x + 3))/(x + exp(x))^(1/3),x)
```

```
[Out] 3*x*(x + exp(x))^(2/3)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{2xe^{x} + 5x + 3e^{x}}{\sqrt[3]{x + e^{x}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x+exp(x)*(3+2*x))/(exp(x)+x)**(1/3),x)
```

```
[Out] Integral((2*x*exp(x) + 5*x + 3*exp(x))/(x + exp(x))**(1/3), x)
```

3.756 $\int \left(\frac{2x}{\sqrt[3]{e^x+x}} + \frac{2e^x x}{\sqrt[3]{e^x+x}} + 3\left(e^x+x\right)^{2/3} \right) dx$

Optimal. Leaf size=12

$$3x\left(x+e^x\right)^{2/3}$$

```
[Out] 3*x*(x+exp(x))^(2/3)
```

Rubi [A] time = 0.14, antiderivative size = 12, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 39, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.051, Rules used = {2273, 2262}

$$3x\left(x+e^x\right)^{2/3}$$

Antiderivative was successfully verified.

```
[In] Int[(2*x)/(E^x + x)^(1/3) + (2*E^x*x)/(E^x + x)^(1/3) + 3*(E^x + x)^(2/3),x
]
```

```
[Out] 3*x*(E^x + x)^(2/3)
```

Rule 2262

```
Int[(F_)^((e_.)*((c_.) + (d_.)*(x_)))*(x_)^(m_.)*((b_.)*(F_)^((e_.)*((c_.)
+ (d_.)*(x_))) + (a_.)*(x_)^(n_.))^(p_.), x_Symbol] :> Simp[(x^m*(a*x^n + b
*F^(e*(c + d*x)))^(p + 1))/(b*d*e*(p + 1)*Log[F]), x] + (-Dist[m/(b*d*e*(p
+ 1)*Log[F]), Int[x^(m - 1)*(a*x^n + b*F^(e*(c + d*x)))^(p + 1), x], x] - D
ist[(a*n)/(b*d*e*Log[F]), Int[x^(m + n - 1)*(a*x^n + b*F^(e*(c + d*x)))^p,
x], x]) /; FreeQ[{F, a, b, c, d, e, m, n, p}, x] && NeQ[p, -1]
```

Rule 2273

```
Int[(x_)^(m_.)*(E^(x_) + (x_)^(m_.))^(n_), x_Symbol] :> -Simp[(E^x + x^m)^(
n + 1)/(n + 1), x] + (Dist[m, Int[x^(m - 1)*(E^x + x^m)^n, x], x] + Int[(E^
x + x^m)^(n + 1), x]) /; RationalQ[m, n] && GtQ[m, 0] && LtQ[n, 0] && NeQ[n
, -1]
```

Rubi steps

$$\begin{aligned}
\int \left(\frac{2x}{\sqrt[3]{e^x+x}} + \frac{2e^x x}{\sqrt[3]{e^x+x}} + 3\left(e^x+x\right)^{2/3} \right) dx &= 2\int \frac{x}{\sqrt[3]{e^x+x}}\,dx + 2\int \frac{e^x x}{\sqrt[3]{e^x+x}}\,dx + 3\int \left(e^x+x\right)^{2/3}\,dx \\
&= -3\left(e^x+x\right)^{2/3} + 3x\left(e^x+x\right)^{2/3} + 2\int \frac{1}{\sqrt[3]{e^x+x}}\,dx - 2\int \frac{x}{\sqrt[3]{e^x+x}} \\
&= 3x\left(e^x+x\right)^{2/3}
\end{aligned}$$

Mathematica [A] time = 0.05, size = 12, normalized size = 1.00

$$3x\left(x+e^x\right)^{2/3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(2*x)/(E^x + x)^(1/3) + (2*E^x*x)/(E^x + x)^(1/3) + 3*(E^x + x)^(
2/3),x]
```

```
[Out] 3*x*(E^x + x)^(2/3)
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2*x/(x+exp(x))^(1/3)+2*exp(x)*x/(x+exp(x))^(1/3)+3*(x+exp(x))^(2/
3),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (has polynomial part)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{2\,xe^{x}}{\left(x+e^{x}\right)^{\frac{1}{3}}}+3\left(x+e^{x}\right)^{\frac{2}{3}}+\frac{2\,x}{\left(x+e^{x}\right)^{\frac{1}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2*x/(x+exp(x))^(1/3)+2*exp(x)*x/(x+exp(x))^(1/3)+3*(x+exp(x))^(2/
3),x, algorithm="giac")
```

```
[Out] integrate(2*x*e^x/(x + e^x)^(1/3) + 3*(x + e^x)^(2/3) + 2*x/(x + e^x)^(1/3)
, x)
```

maple [A] time = 0.06, size = 10, normalized size = 0.83

$$3\left(x+e^{x}\right)^{\frac{2}{3}} x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(2/(x+exp(x))^(1/3)*x+2*exp(x)*x/(x+exp(x))^(1/3)+3*(x+exp(x))^(2/3),x)
```

```
[Out] 3*(x+exp(x))^(2/3)*x
```

maxima [A] time = 1.51, size = 16, normalized size = 1.33

$$\frac{3\left(x^2 + xe^x\right)}{(x + e^x)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2*x/(x+exp(x))^(1/3)+2*exp(x)*x/(x+exp(x))^(1/3)+3*(x+exp(x))^(2/
3),x, algorithm="maxima")
```

```
[Out] 3*(x^2 + x*e^x)/(x + e^x)^(1/3)
```

mupad [B] time = 3.64, size = 9, normalized size = 0.75

$$3\,x\,(x + \mathrm{e}^x)^{2/3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(3*(x + exp(x))^(2/3) + (2*x)/(x + exp(x))^(1/3) + (2*x*exp(x))/(x + exp
(x))^(1/3),x)
```

```
[Out] 3*x*(x + exp(x))^(2/3)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{2xe^x + 5x + 3e^x}{\sqrt[3]{x + e^x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(2*x/(exp(x)+x)**(1/3)+2*exp(x)*x/(exp(x)+x)**(1/3)+3*(exp(x)+x)**
(2/3),x)
```

```
[Out] Integral((2*x*exp(x) + 5*x + 3*exp(x))/(x + exp(x))**(1/3), x)
```

3.757 $\int e^x (-e^{-x} + e^x) (e^{-x} + e^x)^2 \, dx$

Optimal. Leaf size=31

$$-x + \frac{e^{-2x}}{2} + \frac{e^{2x}}{2} + \frac{e^{4x}}{4}$$

```
[Out] 1/2/exp(2*x)+1/2*exp(2*x)+1/4*exp(4*x)-x
```

Rubi [A] time = 0.05, antiderivative size = 31, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2282, 14}

$$-x + \frac{e^{-2x}}{2} + \frac{e^{2x}}{2} + \frac{e^{4x}}{4}$$

Antiderivative was successfully verified.

```
[In] Int[E^x*(-E^(-x) + E^x)*(E^(-x) + E^x)^2,x]
```

```
[Out] 1/(2*E^(2*x)) + E^(2*x)/2 + E^(4*x)/4 - x
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rubi steps

$$\begin{aligned}
\int e^x (-e^{-x} + e^x) (e^{-x} + e^x)^2 \, dx &= \text{Subst}\left(\int \frac{-1 - \frac{1}{x^2} + x^2 + x^4}{x} \, dx, x, e^x\right) \\
&= \text{Subst}\left(\int \left(-\frac{1}{x^3} - \frac{1}{x} + x + x^3\right) dx, x, e^x\right) \\
&= \frac{e^{-2x}}{2} + \frac{e^{2x}}{2} + \frac{e^{4x}}{4} - x
\end{aligned}$$

Mathematica [A] time = 0.01, size = 31, normalized size = 1.00

$$-x+\frac{e^{-2x}}{2}+\frac{e^{2x}}{2}+\frac{e^{4x}}{4}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x*(-E^(-x) + E^x)*(E^(-x) + E^x)^2,x]
```

```
[Out] 1/(2*E^(2*x)) + E^(2*x)/2 + E^(4*x)/4 - x
```

fricas [A] time = 0.41, size = 27, normalized size = 0.87

$$-\frac{1}{4}\left(4\,xe^{(2\,x)}-e^{(6\,x)}-2\,e^{(4\,x)}-2\right)e^{(-2\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(-1/exp(x)+exp(x))*(exp(-x)+exp(x))^2,x, algorithm="fricas
")
```

```
[Out] -1/4*(4*x*e^(2*x) - e^(6*x) - 2*e^(4*x) - 2)*e^(-2*x)
```

giac [A] time = 0.21, size = 28, normalized size = 0.90

$$\frac{1}{2}\left(e^{(2\,x)}+1\right)e^{(-2\,x)}-x+\frac{1}{4}\,e^{(4\,x)}+\frac{1}{2}\,e^{(2\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(-1/exp(x)+exp(x))*(exp(-x)+exp(x))^2,x, algorithm="giac")
```

```
[Out] 1/2*(e^(2*x) + 1)*e^(-2*x) - x + 1/4*e^(4*x) + 1/2*e^(2*x)
```

maple [A] time = 0.03, size = 23, normalized size = 0.74

$$-x+\frac{\mathrm{e}^{-2x}}{2}+\frac{\mathrm{e}^{2x}}{2}+\frac{\mathrm{e}^{4x}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)*(-1/exp(x)+exp(x))*(exp(-x)+exp(x))^2,x)
```

```
[Out] -x+1/2*exp(x)^2+1/4*exp(x)^4+1/2/exp(x)^2
```

maxima [A] time = 0.94, size = 24, normalized size = 0.77

$$\frac{1}{4}\left(2\,e^{(-2\,x)}+1\right)e^{(4\,x)}-x+\frac{1}{2}\,e^{(-2\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(-1/exp(x)+exp(x))*(exp(-x)+exp(x))^2,x, algorithm="maxima
")
```

```
[Out] 1/4*(2*e^(-2*x) + 1)*e^(4*x) - x + 1/2*e^(-2*x)
```

mupad [B] time = 3.39, size = 22, normalized size = 0.71

$$\frac{e^{-2x}}{2} - x + \frac{e^{2x}}{2} + \frac{e^{4x}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-exp(x)*(exp(-x) + exp(x))^2*(exp(-x) - exp(x)),x)
```

```
[Out] exp(-2*x)/2 - x + exp(2*x)/2 + exp(4*x)/4
```

sympy [A] time = 0.12, size = 22, normalized size = 0.71

$$-x + \frac{e^{4x}}{4} + \frac{e^{2x}}{2} + \frac{e^{-2x}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)*(-1/exp(x)+exp(x))*(exp(-x)+exp(x))**2,x)
```

```
[Out] -x + exp(4*x)/4 + exp(2*x)/2 + exp(-2*x)/2
```

3.758 $\int \frac{x}{e^x+x} dx$

Optimal. Leaf size=12

$$\operatorname{Int}\left(\frac{x}{x+e^x},x\right)$$

```
[Out] CannotIntegrate(x/(x+exp(x)),x)
```

Rubi [A] time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x}{e^x+x} dx$$

Verification is Not applicable to the result.

```
[In] Int[x/(E^x + x),x]
[Out] Defer[Int][x/(E^x + x), x]
```

Rubi steps

$$\int \frac{x}{e^x+x} dx = \int \frac{x}{e^x+x} dx$$

Mathematica [A] time = 2.51, size = 0, normalized size = 0.00

$$\int \frac{x}{e^x+x} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x/(E^x + x),x]
[Out] Integrate[x/(E^x + x), x]
```

fricas [A] time = 0.41, size = 0, normalized size = 0.00

$$\operatorname{integral}\left(\frac{x}{x+e^x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(x+exp(x)),x, algorithm="fricas")
[Out] integral(x/(x + e^x), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{x+e^x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(x+exp(x)),x, algorithm="giac")
[Out] integrate(x/(x + e^x), x)
```

maple [A] time = 0.04, size = 0, normalized size = 0.00

$$\int \frac{x}{x+\mathrm{e}^x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(x+exp(x)),x)
[Out] int(x/(x+exp(x)),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{x+e^x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(x+exp(x)),x, algorithm="maxima")
[Out] integrate(x/(x + e^x), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.08

$$\int \frac{x}{x+\mathrm{e}^x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(x + exp(x)),x)
[Out] int(x/(x + exp(x)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{x+e^x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(exp(x)+x),x)
[Out] Integral(x/(x + exp(x)), x)
```

3.759 $\int \frac{x^2}{\sqrt{e^x+x}}\,dx$

Optimal. Leaf size=16

$$\operatorname{Int}\left(\frac{x^2}{\sqrt{x+e^x}},x\right)$$

```
[Out] CannotIntegrate(x^2/(x+exp(x))^(1/2),x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^2}{\sqrt{e^x+x}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^2/Sqrt[E^x + x],x]
[Out] Defer[Int][x^2/Sqrt[E^x + x], x]
```

Rubi steps

$$\int \frac{x^2}{\sqrt{e^x+x}}\,dx=\int \frac{x^2}{\sqrt{e^x+x}}\,dx$$

Mathematica [A] time = 0.05, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\sqrt{e^x+x}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^2/Sqrt[E^x + x],x]
[Out] Integrate[x^2/Sqrt[E^x + x], x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(x+exp(x))^(1/2),x, algorithm="fricas")
```

[Out] Exception raised: TypeError >> Error detected within library code: integ
rate: implementation incomplete (constant residues)

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\sqrt{x+e^x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(x+exp(x))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(x^2/sqrt(x + e^x), x)
```

maple [A] time = 0.04, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\sqrt{x+e^x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(x+exp(x))^(1/2),x)
```

```
[Out] int(x^2/(x+exp(x))^(1/2),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\sqrt{x+e^x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(x+exp(x))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(x^2/sqrt(x + e^x), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.06

$$\int \frac{x^2}{\sqrt{x+e^x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(x + exp(x))^(1/2),x)
```

```
[Out] int(x^2/(x + exp(x))^(1/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\sqrt{x + e^x}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(exp(x)+x)**(1/2),x)
```

```
[Out] Integral(x**2/sqrt(x + exp(x)), x)
```

3.760 $\int \frac{e^x}{e^x+x}\,dx$

Optimal. Leaf size=14

$$\mathrm{Int}\left(\frac{e^x}{x+e^x},x\right)$$

[Out] CannotIntegrate(exp(x)/(x+exp(x)),x)

Rubi [A] time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{e^x}{e^x+x}\,dx$$

Verification is Not applicable to the result.

[In] Int[E^x/(E^x + x),x]

[Out] Defer[Int][E^x/(E^x + x), x]

Rubi steps

$$\int \frac{e^x}{e^x+x}\,dx = \int \frac{e^x}{e^x+x}\,dx$$

Mathematica [A] time = 0.02, size = 0, normalized size = 0.00

$$\int \frac{e^x}{e^x+x}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[E^x/(E^x + x),x]

[Out] Integrate[E^x/(E^x + x), x]

fricas [A] time = 0.40, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{e^x}{x+e^x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(exp(x)/(x+exp(x)),x, algorithm="fricas")

```
[Out] integral(e^x/(x + e^x), x)
```

giac [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^x}{x+e^x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(x+exp(x)),x, algorithm="giac")
[Out] integrate(e^x/(x + e^x), x)
```

maple [**A**] time = 0.04, size = 0, normalized size = 0.00

$$\int \frac{e^x}{x+e^x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(x+exp(x)),x)
[Out] int(exp(x)/(x+exp(x)),x)
```

maxima [**A**] time = 0.00, size = 0, normalized size = 0.00

$$x-\int \frac{x}{x+e^x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(x+exp(x)),x, algorithm="maxima")
[Out] x - integrate(x/(x + e^x), x)
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.07

$$\int \frac{e^x}{x+e^x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(x + exp(x)),x)
[Out] int(exp(x)/(x + exp(x)), x)
```

sympy [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^x}{x+e^x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(exp(x)+x),x)
```

```
[Out] Integral(exp(x)/(x + exp(x)), x)
```

3.761 $\int \frac{e^x}{e^x+x^2} dx$

Optimal. Leaf size=16

$$\mathrm{Int}\left(\frac{e^x}{x^2+e^x},x\right)$$

[Out] CannotIntegrate(exp(x)/(exp(x)+x^2),x)

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{e^x}{e^x+x^2} dx$$

Verification is Not applicable to the result.

[In] Int[E^x/(E^x + x^2),x]

[Out] Defer[Int][E^x/(E^x + x^2), x]

Rubi steps

$$\int \frac{e^x}{e^x+x^2} dx = \int \frac{e^x}{e^x+x^2} dx$$

Mathematica [A] time = 0.03, size = 0, normalized size = 0.00

$$\int \frac{e^x}{e^x+x^2} dx$$

Verification is Not applicable to the result.

[In] Integrate[E^x/(E^x + x^2),x]

[Out] Integrate[E^x/(E^x + x^2), x]

fricas [A] time = 0.40, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{e^x}{x^2+e^x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(exp(x)/(exp(x)+x^2),x, algorithm="fricas")

```
[Out] integral(e^x/(x^2 + e^x), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^x}{x^2+e^x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(exp(x)+x^2),x, algorithm="giac")
[Out] integrate(e^x/(x^2 + e^x), x)
```

maple [A] time = 0.04, size = 0, normalized size = 0.00

$$\int \frac{\mathrm{e}^x}{x^2+\mathrm{e}^x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(exp(x)+x^2),x)
[Out] int(exp(x)/(exp(x)+x^2),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$x-\int \frac{x^2}{x^2+e^x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(exp(x)+x^2),x, algorithm="maxima")
[Out] x - integrate(x^2/(x^2 + e^x), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.06

$$\int \frac{\mathrm{e}^x}{\mathrm{e}^x+x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x)/(exp(x) + x^2),x)
[Out] int(exp(x)/(exp(x) + x^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{e^x}{x^2+e^x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x)/(exp(x)+x**2),x)
```

```
[Out] Integral(exp(x)/(x**2 + exp(x)), x)
```

3.762 $\int \frac{\mathbf{F0}(x)}{x+\mathbf{F0}(x)}\,dx$

Optimal. Leaf size=15

$$x - \mathrm{Int}\left(\frac{x}{\mathrm{F0}(x)+x}, x\right)$$

```
[Out] x-CannotIntegrate(x/(x+F0(x)),x)
```

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\mathrm{F0}(x)}{x+\mathrm{F0}(x)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[F0[x]/(x + F0[x]),x]
[Out] x - Defer[Int][x/(x + F0[x]), x]
```

Rubi steps

$$\begin{aligned}\int \frac{\mathrm{F0}(x)}{x+\mathrm{F0}(x)}\,dx &= \int \left(1-\frac{x}{x+\mathrm{F0}(x)}\right)dx\\ &= x-\int \frac{x}{x+\mathrm{F0}(x)}\,dx\end{aligned}$$

Mathematica [A] time = 0.05, size = 0, normalized size = 0.00

$$\int \frac{\mathrm{F0}(x)}{x+\mathrm{F0}(x)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[F0[x]/(x + F0[x]),x]
[Out] Integrate[F0[x]/(x + F0[x]), x]
```

fricas [A] time = 0.39, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{F_0(x)}{x+F_0(x)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F0(x)/(x+F0(x)),x, algorithm="fricas")
```

```
[Out] integral(F0(x)/(x + F0(x)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F_0(x)}{x + F_0(x)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F0(x)/(x+F0(x)),x, algorithm="giac")
```

```
[Out] integrate(F0(x)/(x + F0(x)), x)
```

maple [A] time = 0.03, size = 0, normalized size = 0.00

$$\int \frac{F0(x)}{x + F0(x)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F0(x)/(x+F0(x)),x)
```

```
[Out] int(F0(x)/(x+F0(x)),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F_0(x)}{x + F_0(x)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F0(x)/(x+F0(x)),x, algorithm="maxima")
```

```
[Out] integrate(F0(x)/(x + F0(x)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.07

$$\int \frac{F_0(x)}{x + F_0(x)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F0(x)/(x + F0(x)),x)
```

```
[Out] int(F0(x)/(x + F0(x)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F_0(x)}{x + F_0(x)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F0(x)/(x+F0(x)),x)
```

```
[Out] Integral(F0(x)/(x + F0(x)), x)
```

3.763 $\int \frac{\mathbf{F0}(x)}{x^2+\mathbf{F0}(x)}\,dx$

Optimal. Leaf size=19

$$x-\mathrm{Int}\left(\frac{x^2}{\mathrm{F0}(x)+x^2},x\right)$$

[Out] x-CannotIntegrate(x^2/(x^2+F0(x)),x)

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\mathrm{F0}(x)}{x^2+\mathrm{F0}(x)}\,dx$$

Verification is Not applicable to the result.

[In] Int[F0[x]/(x^2 + F0[x]),x]

[Out] x - Defer[Int][x^2/(x^2 + F0[x]), x]

Rubi steps

$$\begin{aligned}\int \frac{\mathrm{F0}(x)}{x^2+\mathrm{F0}(x)}\,dx &= \int \left(1-\frac{x^2}{x^2+\mathrm{F0}(x)}\right)dx\\ &= x-\int \frac{x^2}{x^2+\mathrm{F0}(x)}\,dx\end{aligned}$$

Mathematica [A] time = 0.05, size = 0, normalized size = 0.00

$$\int \frac{\mathrm{F0}(x)}{x^2+\mathrm{F0}(x)}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[F0[x]/(x^2 + F0[x]),x]

[Out] Integrate[F0[x]/(x^2 + F0[x]), x]

fricas [A] time = 0.39, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{F_0(x)}{x^2+F_0(x)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F0(x)/(x^2+F0(x)),x, algorithm="fricas")
[Out] integral(F0(x)/(x^2 + F0(x)), x)
```

giac [**A**]   time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F_0(x)}{x^2 + F_0(x)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F0(x)/(x^2+F0(x)),x, algorithm="giac")
[Out] integrate(F0(x)/(x^2 + F0(x)), x)
```

maple [**A**]   time = 0.03, size = 0, normalized size = 0.00

$$\int \frac{F0(x)}{x^2 + F0(x)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F0(x)/(x^2+F0(x)),x)
[Out] int(F0(x)/(x^2+F0(x)),x)
```

maxima [**A**]   time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F_0(x)}{x^2 + F_0(x)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F0(x)/(x^2+F0(x)),x, algorithm="maxima")
[Out] integrate(F0(x)/(x^2 + F0(x)), x)
```

mupad [**A**]   time = 0.00, size = -1, normalized size = -0.05

$$\int \frac{F_0(x)}{F_0(x) + x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F0(x)/(F0(x) + x^2),x)
[Out] int(F0(x)/(F0(x) + x^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F_0(x)}{x^2 + F_0(x)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F0(x)/(x**2+F0(x)),x)
```

```
[Out] Integral(F0(x)/(x**2 + F0(x)), x)
```

3.764 $\int \frac{\mathbf{F0}(x)}{(x+\mathbf{F0}(x))^2}\,dx$

Optimal. Leaf size=23

$$\text{Int}\left(\frac{1}{\text{F0}(x)+x},x\right)-\text{Int}\left(\frac{x}{(\text{F0}(x)+x)^2},x\right)$$

```
[Out] -CannotIntegrate(x/(x+F0(x))^2,x)+CannotIntegrate(1/(x+F0(x)),x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\text{F0}(x)}{(x+\text{F0}(x))^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[F0[x]/(x + F0[x])^2,x]
```

```
[Out] -Defer[Int][x/(x + F0[x])^2, x] + Defer[Int][(x + F0[x])^(-1), x]
```

Rubi steps

$$\begin{aligned}\int \frac{\text{F0}(x)}{(x+\text{F0}(x))^2}\,dx &= \int \left(-\frac{x}{(x+\text{F0}(x))^2}+\frac{1}{x+\text{F0}(x)}\right)dx\\ &= -\int \frac{x}{(x+\text{F0}(x))^2}\,dx+\int \frac{1}{x+\text{F0}(x)}\,dx\end{aligned}$$

Mathematica [A] time = 0.02, size = 0, normalized size = 0.00

$$\int \frac{\text{F0}(x)}{(x+\text{F0}(x))^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[F0[x]/(x + F0[x])^2,x]
```

```
[Out] Integrate[F0[x]/(x + F0[x])^2, x]
```

fricas [A] time = 0.39, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{F_0(x)}{x^2+2\,xF_0(x)+F_0(x)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F0(x)/(x+F0(x))^2,x, algorithm="fricas")
```

```
[Out] integral(F0(x)/(x^2 + 2*x*F0(x) + F0(x)^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F_0(x)}{(x + F_0(x))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F0(x)/(x+F0(x))^2,x, algorithm="giac")
```

```
[Out] integrate(F0(x)/(x + F0(x))^2, x)
```

maple [A] time = 0.02, size = 0, normalized size = 0.00

$$\int \frac{F0(x)}{(x + F0(x))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F0(x)/(x+F0(x))^2,x)
```

```
[Out] int(F0(x)/(x+F0(x))^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F_0(x)}{(x + F_0(x))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F0(x)/(x+F0(x))^2,x, algorithm="maxima")
```

```
[Out] integrate(F0(x)/(x + F0(x))^2, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{F_0(x)}{(x + F_0(x))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F0(x)/(x + F0(x))^2,x)
```

```
[Out] int(F0(x)/(x + F0(x))^2, x)
```

sympy [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F_0(x)}{(x + F_0(x))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F0(x)/(x+F0(x))**2,x)
```

```
[Out] Integral(F0(x)/(x + F0(x))**2, x)
```

3.765 $\int \frac{\mathbf{F0}(x)}{(x^2+\mathbf{F0}(x))^2}\,dx$

Optimal. Leaf size=29

$$\mathrm{Int}\left(\frac{1}{\mathrm{F0}(x)+x^2},x\right)-\mathrm{Int}\left(\frac{x^2}{\left(\mathrm{F0}(x)+x^2\right)^2},x\right)$$

```
[Out] -CannotIntegrate(x^2/(x^2+F0(x))^2,x)+CannotIntegrate(1/(x^2+F0(x)),x)
```

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\mathrm{F0}(x)}{\left(x^2+\mathrm{F0}(x)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[F0[x]/(x^2 + F0[x])^2,x]
```

```
[Out] -Defer[Int][x^2/(x^2 + F0[x])^2, x] + Defer[Int][(x^2 + F0[x])^(-1), x]
```

Rubi steps

$$\begin{aligned}\int \frac{\mathrm{F0}(x)}{\left(x^2+\mathrm{F0}(x)\right)^2}\,dx &= \int \left(-\frac{x^2}{\left(x^2+\mathrm{F0}(x)\right)^2}+\frac{1}{x^2+\mathrm{F0}(x)}\right)dx\\ &= -\int \frac{x^2}{\left(x^2+\mathrm{F0}(x)\right)^2}\,dx+\int \frac{1}{x^2+\mathrm{F0}(x)}\,dx\end{aligned}$$

Mathematica [A] time = 0.02, size = 0, normalized size = 0.00

$$\int \frac{\mathrm{F0}(x)}{\left(x^2+\mathrm{F0}(x)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[F0[x]/(x^2 + F0[x])^2,x]
```

```
[Out] Integrate[F0[x]/(x^2 + F0[x])^2, x]
```

fricas [A] time = 0.38, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{F_0(x)}{x^4 + 2\,x^2 F_0(x) + F_0(x)^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F0(x)/(x^2+F0(x))^2,x, algorithm="fricas")
[Out] integral(F0(x)/(x^4 + 2*x^2*F0(x) + F0(x)^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F_0(x)}{\left(x^2 + F_0(x)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F0(x)/(x^2+F0(x))^2,x, algorithm="giac")
[Out] integrate(F0(x)/(x^2 + F0(x))^2, x)
```

maple [A] time = 0.03, size = 0, normalized size = 0.00

$$\int \frac{F0(x)}{\left(x^2 + F0(x)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F0(x)/(x^2+F0(x))^2,x)
[Out] int(F0(x)/(x^2+F0(x))^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F_0(x)}{\left(x^2 + F_0(x)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F0(x)/(x^2+F0(x))^2,x, algorithm="maxima")
[Out] integrate(F0(x)/(x^2 + F0(x))^2, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{F_0(x)}{\left(F_0(x) + x^2\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(F0(x)/(F0(x) + x^2)^2,x)
```

```
[Out] int(F0(x)/(F0(x) + x^2)^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{F_0(x)}{\left(x^2 + F_0(x)\right)^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(F0(x)/(x**2+F0(x))**2,x)
```

```
[Out] Integral(F0(x)/(x**2 + F0(x))**2, x)
```

3.766 $\int \left(aF^{c+dx}\right)^m \left(bF^{e+fx}\right)^n \, dx$

Optimal. Leaf size=36

$$\frac{\left(aF^{c+dx}\right)^m \left(bF^{e+fx}\right)^n}{\log(F)(dm+fn)}$$

```
[Out] (a*F^(d*x+c))^m*(b*F^(f*x+e))^n/(d*m+f*n)/ln(F)
```

Rubi [A] time = 0.10, antiderivative size = 36, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used = {2281, 2227, 2194}

$$\frac{\left(aF^{c+dx}\right)^m \left(bF^{e+fx}\right)^n}{\log(F)(dm+fn)}$$

Antiderivative was successfully verified.

```
[In] Int[(a*F^(c + d*x))^m*(b*F^(e + f*x))^n,x]
```

```
[Out] ((a*F^(c + d*x))^m*(b*F^(e + f*x))^n)/((d*m + f*n)*Log[F])
```

Rule 2194

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 2227

```
Int[(u_.)*(F_)^((a_.) + (b_.)*(v_)), x_Symbol] :> Int[u*F^(a + b*NormalizeP
owerOfLinear[v, x]), x] /; FreeQ[{F, a, b}, x] && PolynomialQ[u, x] && Powe
rOfLinearQ[v, x] &&  !PowerOfLinearMatchQ[v, x]
```

Rule 2281

```
Int[(u_.)*((a_.)*(F_)^(v_))^(n_), x_Symbol] :> Dist[(a*F^v)^n/F^(n*v), Int[
u*F^(n*v), x], x] /; FreeQ[{F, a, n}, x] &&  !IntegerQ[n]
```

Rubi steps

$$\int \left(aF^{c+dx}\right)^m \left(bF^{e+fx}\right)^n \,dx = \left(F^{-m(c+dx)}\left(aF^{c+dx}\right)^m\right)\int F^{m(c+dx)}\left(bF^{e+fx}\right)^n \,dx$$
$$= \left(F^{-m(c+dx)-n(e+fx)}\left(aF^{c+dx}\right)^m\left(bF^{e+fx}\right)^n\right)\int F^{m(c+dx)+n(e+fx)}dx$$
$$= \left(F^{-m(c+dx)-n(e+fx)}\left(aF^{c+dx}\right)^m\left(bF^{e+fx}\right)^n\right)\int F^{cm+en+(dm+fn)x}dx$$
$$= \frac{\left(aF^{c+dx}\right)^m\left(bF^{e+fx}\right)^n}{(dm+fn)\log(F)}$$

Mathematica [A] time = 0.05, size = 36, normalized size = 1.00

$$\frac{\left(aF^{c+dx}\right)^m\left(bF^{e+fx}\right)^n}{dm\log(F)+fn\log(F)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*F^(c + d*x))^m*(b*F^(e + f*x))^n,x]
[Out] ((a*F^(c + d*x))^m*(b*F^(e + f*x))^n)/(d*m*Log[F] + f*n*Log[F])
```

fricas [A] time = 0.41, size = 46, normalized size = 1.28

$$\frac{e^{\left((dmx+cm)\log(F)+\left(fnx+en\right)\log(F)+m\log(a)+n\log(b)\right)}}{\left(dm+fn\right)\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a*F^(d*x+c))^m*(b*F^(f*x+e))^n,x, algorithm="fricas")
[Out] e^((d*m*x + c*m)*log(F) + (f*n*x + e*n)*log(F) + m*log(a) + n*log(b))/((d*m
 + f*n)*log(F))
```

giac [A] time = 0.73, size = 47, normalized size = 1.31

$$\frac{e^{\left(dmx\log(F)+fnx\log(F)+cm\log(F)+ne\log(F)+m\log(a)+n\log(b)\right)}}{dm\log(F)+fn\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a*F^(d*x+c))^m*(b*F^(f*x+e))^n,x, algorithm="giac")
```

```
[Out] e^(d*m*x*log(F) + f*n*x*log(F) + c*m*log(F) + n*e*log(F) + m*log(a) + n*log
(b))/(d*m*log(F) + f*n*log(F))
```

maple [A] time = 0.03, size = 37, normalized size = 1.03

$$\frac{\left(a\,F^{dx+c}\right)^{m}\left(b\,F^{fx+e}\right)^{n}}{\left(md+fn\right)\ln(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*F^(d*x+c))^m*(b*F^(f*x+e))^n,x)
[Out] (a*F^(d*x+c))^m*(b*F^(f*x+e))^n/(d*m+f*n)/ln(F)
```

maxima [A] time = 0.88, size = 65, normalized size = 1.81

$$\frac{\left(F^{e}\right)^{n}a^{m}b^{n}e^{\left(m\log\left(F^{dx+c}\right)+n\log\left(\left(F^{dx+c}\right)^{\frac{f}{d}}\right)\right)}}{\left(dm+fn\right)\left(F^{\frac{cf}{d}}\right)^{n}\log(F)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a*F^(d*x+c))^m*(b*F^(f*x+e))^n,x, algorithm="maxima")
[Out] (F^e)^n*a^m*b^n*e^(m*log(F^(d*x + c)) + n*log((F^(d*x + c))^(f/d)))/((d*m +
 f*n)*(F^(c*f/d))^n*log(F))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.03

$$\int \left(F^{c+d\,x}\,a\right)^m\,\left(F^{e+f\,x}\,b\right)^n \,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((F^(c + d*x)*a)^m*(F^(e + f*x)*b)^n,x)
[Out] int((F^(c + d*x)*a)^m*(F^(e + f*x)*b)^n, x)
```

sympy [A] time = 43.31, size = 143, normalized size = 3.97

$$\begin{cases} a^{m} b^{n} x & \text{for}\: F = 1 \wedge \left(F = 1 \vee d = - \frac{f n}{m}\right) \\ a^{m} b^{n} x \left(F^{c}\right)^{m} \left(F^{e}\right)^{n} \left(F^{f x}\right)^{n} \left(F^{- \frac{f n x}{m}}\right)^{m} + \frac{a^{m} b^{n} \left(F^{c}\right)^{m} \left(F^{e}\right)^{n} \left(F^{f x}\right)^{n} \left(F^{- \frac{f n x}{m}}\right)^{m}}{f n \log{\left(F \right)}} & \text{for}\: d = - \frac{f n}{m} \\ \frac{a^{m} b^{n} \left(F^{c}\right)^{m} \left(F^{e}\right)^{n} \left(F^{d x}\right)^{m} \left(F^{f x}\right)^{n}}{d m \log{\left(F \right)} + f n \log{\left(F \right)}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a*F**(d*x+c))**m*(b*F**(f*x+e))**n,x)
```

```
[Out] Piecewise((a**m*b**n*x, Eq(F, 1) & (Eq(F, 1) | Eq(d, -f*n/m))), (a**m*b**n*
x*(F**c)**m*(F**e)**n*(F**(f*x))**n*(F**(-f*n*x/m))**m + a**m*b**n*(F**c)**
m*(F**e)**n*(F**(f*x))**n*(F**(-f*n*x/m))**m/(f*n*log(F)), Eq(d, -f*n/m)),
(a**m*b**n*(F**c)**m*(F**e)**n*(F**(d*x))**m*(F**(f*x))**n/(d*m*log(F) + f*
n*log(F)), True))
```

3.767 $\int e^{a+c+bx^n+dx^n}\,dx$

Optimal. Leaf size=37

$$-\frac{xe^{a+c}\left(-\left((b+d)x^n\right)\right)^{-1/n}\Gamma\left(\frac{1}{n},-\left((b+d)x^n\right)\right)}{n}$$

[Out] -exp(a+c)*x*GAMMA(1/n,-(b+d)*x^n)/n/((-(b+d)*x^n)^(1/n))

Rubi [A] time = 0.04, antiderivative size = 37, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {6741, 2208}

$$-\frac{xe^{a+c}\left(-(b+d)x^n\right)^{-1/n}\text{Gamma}\left(\frac{1}{n},-(b+d)x^n\right)}{n}$$

Antiderivative was successfully verified.

[In] Int[E^(a + c + b*x^n + d*x^n),x]

[Out] -((E^(a + c)*x*Gamma[n^(-1), -((b + d)*x^n)])/(n*(-((b + d)*x^n))^n^(-1)))

Rule 2208

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> -Simp[(F^a
*(c + d*x)*Gamma[1/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x)^n*Log[F
]))^(1/n)), x] /; FreeQ[{F, a, b, c, d, n}, x] && !IntegerQ[2/n]
```

Rule 6741

```
Int[u_, x_Symbol] :> With[{v = NormalizeIntegrand[u, x]}, Int[v, x] /; v =!
= u]
```

Rubi steps

$$\begin{aligned}\int e^{a+c+bx^n+dx^n}\,dx &= \int e^{a+c+(b+d)x^n}\,dx\\ &= -\frac{e^{a+c}x\left(-(b+d)x^n\right)^{-1/n}\Gamma\left(\frac{1}{n},-(b+d)x^n\right)}{n}\end{aligned}$$

Mathematica [A] time = 0.02, size = 37, normalized size = 1.00

$$-\frac{xe^{a+c}\left(-\left((b+d)x^n\right)\right)^{-1/n}\Gamma\left(\frac{1}{n},-\left((b+d)x^n\right)\right)}{n}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a + c + b*x^n + d*x^n),x]
[Out] -((E^(a + c)*x*Gamma[n^(-1), -((b + d)*x^n)])/(n*(-((b + d)*x^n))^n^(-1)))
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(e^{\left((b+d)x^n+a+c\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(a+c+b*x^n+d*x^n),x, algorithm="fricas")
[Out] integral(e^((b + d)*x^n + a + c), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int e^{\left(bx^n+dx^n+a+c\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(a+c+b*x^n+d*x^n),x, algorithm="giac")
[Out] integrate(e^(b*x^n + d*x^n + a + c), x)
```

maple [C] time = 0.15, size = 241, normalized size = 6.51

$$\frac{\left(\frac{((-b-d)n\,x^n+n+1)n^2x^{-n+1}((-b-d)x^n)^{-\frac{n+1}{2n}}(-b-d)^{\frac{1}{n}-1}\,\text{WhittakerM}\left(\frac{1}{n}-\frac{n+1}{2n},\frac{n+1}{2n}+\frac{1}{2},(-b-d)x^n\right)\mathrm{e}^{-\frac{(-b-d)x^n}{2}}}{(n+1)(2n+1)}+\frac{(n+1)n\,x^{-n+1}((-b-d)x^n)^{-\frac{n+1}{2n}}(-b-d}{}\right.}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(a+c+b*x^n+d*x^n),x)
[Out] exp(a+c)/n*(-b-d)^(-1/n)*(n^2*x^(-n+1)*(-b-d)^(1/n-1)*(n*x^n*(-b-d)+n+1)/(n
+1)/(2*n+1)*(x^n*(-b-d))^(-1/2*(n+1)/n)*exp(-1/2*x^n*(-b-d))*WhittakerM(1/n
-1/2*(n+1)/n,1/2*(n+1)/n+1/2,x^n*(-b-d))+n*x^(-n+1)*(-b-d)^(1/n-1)*(n+1)/(2
```

```
*n+1)*(x^n*(-b-d))^(-1/2*(n+1)/n)*exp(-1/2*x^n*(-b-d))*WhittakerM(1/n-1/2*(
n+1)/n+1,1/2*(n+1)/n+1/2,x^n*(-b-d)))
```

maxima [A] time = 0.99, size = 36, normalized size = 0.97

$$-\frac{xe^{(a+c)}\Gamma\left(\frac{1}{n}, -(b+d)x^n\right)}{\left(-(b+d)x^n\right)^{\left(\frac{1}{n}\right)}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(a+c+b*x^n+d*x^n),x, algorithm="maxima")
[Out] -x*e^(a + c)*gamma(1/n, -(b + d)*x^n)/((-(b + d)*x^n)^(1/n)*n)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.03

$$\int \mathrm{e}^{a+c+b\,x^n+d\,x^n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(a + c + b*x^n + d*x^n),x)
[Out] int(exp(a + c + b*x^n + d*x^n), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$e^{a}e^{c}\int e^{bx^{n}}e^{dx^{n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(a+c+b*x**n+d*x**n),x)
[Out] exp(a)*exp(c)*Integral(exp(b*x**n)*exp(d*x**n), x)
```

3.768 $\int f^{a+bx^n} g^{c+dx^n} \, dx$

Optimal. Leaf size=50

$$-\frac{x f^a g^c \left(-x^n (b \log(f) + d \log(g))\right)^{-1/n} \Gamma\left(\frac{1}{n}, -x^n (b \log(f) + d \log(g))\right)}{n}$$

```
[Out] -f^a*g^c*x*GAMMA(1/n,-x^n*(b*ln(f)+d*ln(g)))/n/((-x^n*(b*ln(f)+d*ln(g)))^(1
/n))
```

Rubi [A] time = 0.04, antiderivative size = 50, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105, Rules used = {2287, 2208}

$$-\frac{x f^a g^c \left(-x^n (b \log(f) + d \log(g))\right)^{-1/n} \text{Gamma}\left(\frac{1}{n}, -x^n (b \log(f) + d \log(g))\right)}{n}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x^n)*g^(c + d*x^n),x]
```

```
[Out] -((f^a*g^c*x*Gamma[n^(-1), -(x^n*(b*Log[f] + d*Log[g]))])/(n*(-(x^n*(b*Log[
f] + d*Log[g])))^n^(-1)))
```

Rule 2208

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> -Simp[(F^a
*(c + d*x)*Gamma[1/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x)^n*Log[F
]))^(1/n)), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rule 2287

```
Int[(u_.)*(F_)^(v_)*(G_)^(w_), x_Symbol] :> With[{z = v*Log[F] + w*Log[G]},
 Int[u*NormalizeIntegrand[E^z, x], x] /; BinomialQ[z, x] || (PolynomialQ[z,
 x] && LeQ[Exponent[z, x], 2])] /; FreeQ[{F, G}, x]
```

Rubi steps

$$\begin{aligned}
\int f^{a+bx^n} g^{c+dx^n} \, dx &= \int \exp\left(a \log(f) + c \log(g) + x^n (b \log(f) + d \log(g))\right) \, dx \\
&= -\frac{f^a g^c x \Gamma\left(\frac{1}{n}, -x^n (b \log(f) + d \log(g))\right) \left(-x^n (b \log(f) + d \log(g))\right)^{-1/n}}{n}
\end{aligned}$$

Mathematica [A] time = 0.03, size = 50, normalized size = 1.00

$$-\frac{xf^ag^c\left(-x^n(b\log(f)+d\log(g))\right)^{-1/n}\Gamma\left(\frac{1}{n},-x^n(b\log(f)+d\log(g))\right)}{n}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x^n)*g^(c + d*x^n),x]
```

```
[Out] -((f^a*g^c*x*Gamma[n^(-1), -(x^n*(b*Log[f] + d*Log[g]))])/(n*(-(x^n*(b*Log[
f] + d*Log[g])))^n^(-1)))
```

fricas [F] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(f^{bx^n+a}g^{dx^n+c},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*g^(c+d*x^n),x, algorithm="fricas")
```

```
[Out] integral(f^(b*x^n + a)*g^(d*x^n + c), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{bx^n+a}g^{dx^n+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*g^(c+d*x^n),x, algorithm="giac")
```

```
[Out] integrate(f^(b*x^n + a)*g^(d*x^n + c), x)
```

maple [F] time = 0.26, size = 0, normalized size = 0.00

$$\int f^{b\,x^n+a}g^{d\,x^n+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(b*x^n+a)*g^(d*x^n+c),x)
```

```
[Out] int(f^(b*x^n+a)*g^(d*x^n+c),x)
```

maxima [A] time = 1.25, size = 50, normalized size = 1.00

$$-\frac{f^ag^cx\Gamma\left(\frac{1}{n},-\left(b\log(f)+d\log(g)\right)x^n\right)}{\left(-\left(b\log(f)+d\log(g)\right)x^n\right)^{\left(\frac{1}{n}\right)}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(a+b*x^n)*g^(c+d*x^n),x, algorithm="maxima")
```

```
[Out] -f^a*g^c*x*gamma(1/n, -(b*log(f) + d*log(g))*x^n)/((-(b*log(f) + d*log(g))*
x^n)^(1/n)*n)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int f^{a+b\,x^n}\,g^{c+d\,x^n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(a + b*x^n)*g^(c + d*x^n),x)
```

```
[Out] int(f^(a + b*x^n)*g^(c + d*x^n), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(a+b*x**n)*g**(c+d*x**n),x)
```

```
[Out] Timed out
```

3.769 $\int e^{x^n} x^m \, dx$

Optimal. Leaf size=37

$$-\frac{x^{m+1}(-x^n)^{-\frac{m+1}{n}}\Gamma\left(\frac{m+1}{n},-x^n\right)}{n}$$

```
[Out] -x^(1+m)*GAMMA((1+m)/n,-x^n)/n/((-x^n)^((1+m)/n))
```

Rubi [A] time = 0.02, antiderivative size = 37, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2218}

$$-\frac{x^{m+1}(-x^n)^{-\frac{m+1}{n}}\text{Gamma}\left(\frac{m+1}{n},-x^n\right)}{n}$$

Antiderivative was successfully verified.

```
[In] Int[E^x^n*x^m,x]
```

```
[Out] -((x^(1 + m)*Gamma[(1 + m)/n, -x^n])/(n*(-x^n)^((1 + m)/n)))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int e^{x^n} x^m \, dx = -\frac{x^{1+m}(-x^n)^{-\frac{1+m}{n}}\Gamma\left(\frac{1+m}{n},-x^n\right)}{n}$$

Mathematica [A] time = 0.01, size = 37, normalized size = 1.00

$$-\frac{x^{m+1}(-x^n)^{-\frac{m+1}{n}}\Gamma\left(\frac{m+1}{n},-x^n\right)}{n}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^x^n*x^m,x]
[Out] -((x^(1 + m)*Gamma[(1 + m)/n, -x^n])/(n*(-x^n)^((1 + m)/n)))
```

fricas [F] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(x^m e^{(x^n)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^n)*x^m,x, algorithm="fricas")
[Out] integral(x^m*e^(x^n), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x^m e^{(x^n)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^n)*x^m,x, algorithm="giac")
[Out] integrate(x^m*e^(x^n), x)
```

maple [F] time = 0.10, size = 0, normalized size = 0.00

$$\int x^m \mathrm{e}^{x^n}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(x^n)*x^m,x)
[Out] int(exp(x^n)*x^m,x)
```

maxima [A] time = 0.98, size = 38, normalized size = 1.03

$$-\frac{x^{m+1}\Gamma\left(\frac{m+1}{n}, -x^n\right)}{n\left(-x^n\right)^{\frac{m+1}{n}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x^n)*x^m,x, algorithm="maxima")
[Out] -x^(m + 1)*gamma((m + 1)/n, -x^n)/(n*(-x^n)^((m + 1)/n))
```

mupad [B] time = 3.75, size = 58, normalized size = 1.57

$$\frac{x^{m+1}\,\mathrm{e}^{\frac{x^n}{2}}\,\mathrm{M}_{1-\frac{m+n+1}{2n},\frac{m+n+1}{2n}-\frac{1}{2}}\left(x^n\right)}{\left(x^n\right)^{\frac{m+n+1}{2n}}\,\left(m+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*exp(x^n),x)
```

```
[Out] (x^(m + 1)*exp(x^n/2)*whittakerM(1 - (m + n + 1)/(2*n), (m + n + 1)/(2*n) -
 1/2, x^n))/((x^n)^((m + n + 1)/(2*n))*(m + 1))
```

sympy [C] time = 1.38, size = 105, normalized size = 2.84

$$\frac{me^{-\frac{i\pi}{n}}e^{-\frac{i\pi m}{n}}\Gamma\left(\frac{m}{n}+\frac{1}{n}\right)\gamma\left(\frac{m}{n}+\frac{1}{n},x^ne^{i\pi}\right)}{n^2\Gamma\left(\frac{m}{n}+1+\frac{1}{n}\right)}+\frac{e^{-\frac{i\pi}{n}}e^{-\frac{i\pi m}{n}}\Gamma\left(\frac{m}{n}+\frac{1}{n}\right)\gamma\left(\frac{m}{n}+\frac{1}{n},x^ne^{i\pi}\right)}{n^2\Gamma\left(\frac{m}{n}+1+\frac{1}{n}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(x**n)*x**m,x)
```

```
[Out] m*exp(-I*pi/n)*exp(-I*pi*m/n)*gamma(m/n + 1/n)*lowergamma(m/n + 1/n, x**n*e
xp_polar(I*pi))/(n**2*gamma(m/n + 1 + 1/n)) + exp(-I*pi/n)*exp(-I*pi*m/n)*g
amma(m/n + 1/n)*lowergamma(m/n + 1/n, x**n*exp_polar(I*pi))/(n**2*gamma(m/n
 + 1 + 1/n))
```

3.770 $\int f^{x^n} x^m \, dx$

Optimal. Leaf size=41

$$-\frac{x^{m+1} \left(\log(f) \left(-x^n\right)\right)^{-\frac{m+1}{n}} \Gamma\left(\frac{m+1}{n}, -x^n \log(f)\right)}{n}$$

```
[Out] -x^(1+m)*GAMMA((1+m)/n,-x^n*ln(f))/n/((-x^n*ln(f))^((1+m)/n))
```

Rubi [A] time = 0.02, antiderivative size = 41, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2218}

$$-\frac{x^{m+1} \left(\log(f) \left(-x^n\right)\right)^{-\frac{m+1}{n}} \text{Gamma}\left(\frac{m+1}{n}, \log(f) \left(-x^n\right)\right)}{n}$$

Antiderivative was successfully verified.

```
[In] Int[f^x^n*x^m,x]
```

```
[Out] -((x^(1 + m)*Gamma[(1 + m)/n, -(x^n*Log[f])])/(n*(-(x^n*Log[f]))^((1 + m)/n
)))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{x^n} x^m \, dx = -\frac{x^{1+m} \Gamma\left(\frac{1+m}{n}, -x^n \log(f)\right) \left(-x^n \log(f)\right)^{-\frac{1+m}{n}}}{n}$$

Mathematica [A] time = 0.01, size = 41, normalized size = 1.00

$$-\frac{x^{m+1} \left(\log(f) \left(-x^n\right)\right)^{-\frac{m+1}{n}} \Gamma\left(\frac{m+1}{n}, -x^n \log(f)\right)}{n}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^x^n*x^m,x]
```

```
[Out] -((x^(1 + m)*Gamma[(1 + m)/n, -(x^n*Log[f])])/(n*(-(x^n*Log[f]))^((1 + m)/n
)))
```

fricas [F] time = 0.40, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(f^{(x^n)}x^m, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(x^n)*x^m,x, algorithm="fricas")
```

```
[Out] integral(f^(x^n)*x^m, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{(x^n)}x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(x^n)*x^m,x, algorithm="giac")
```

```
[Out] integrate(f^(x^n)*x^m, x)
```

maple [F] time = 0.15, size = 0, normalized size = 0.00

$$\int f^{x^n}x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(x^n)*x^m,x)
```

```
[Out] int(f^(x^n)*x^m,x)
```

maxima [A] time = 1.01, size = 42, normalized size = 1.02

$$-\frac{x^{m+1}\Gamma\left(\frac{m+1}{n}, -x^n\log(f)\right)}{\left(-x^n\log(f)\right)^{\frac{m+1}{n}}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^(x^n)*x^m,x, algorithm="maxima")
```

```
[Out] -x^(m + 1)*gamma((m + 1)/n, -x^n*log(f))/((-x^n*log(f))^((m + 1)/n)*n)
```

mupad [B] time = 3.78, size = 71, normalized size = 1.73

$$\frac{f^{x^n}\, x^{m+1}\, \mathrm{e}^{-\frac{x^n\, \ln(f)}{2}}\, \mathrm{M}_{1-\frac{m+n+1}{2\,n},\frac{m+n+1}{2\,n}-\frac{1}{2}}\left(x^n\, \ln(f)\right)}{\left(x^n\, \ln(f)\right)^{\frac{m+n+1}{2\,n}}\, (m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^(x^n)*x^m,x)
```

```
[Out] (f^(x^n)*x^(m + 1)*exp(-(x^n*log(f))/2)*whittakerM(1 - (m + n + 1)/(2*n), (
m + n + 1)/(2*n) - 1/2, x^n*log(f)))/((x^n*log(f))^((m + n + 1)/(2*n))*(m +
 1))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{x^n} x^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**(x**n)*x**m,x)
```

```
[Out] Integral(f**(x**n)*x**m, x)
```

3.771 $\int e^{(a+bx)^n}(a+bx)^m\,dx$

Optimal. Leaf size=52

$$-\frac{(a+bx)^{m+1}\left(-(a+bx)^n\right)^{-\frac{m+1}{n}}\Gamma\left(\frac{m+1}{n},-(a+bx)^n\right)}{bn}$$

```
[Out] -(b*x+a)^(1+m)*GAMMA((1+m)/n,-(b*x+a)^n)/b/n/((-(b*x+a)^n)^((1+m)/n))
```

Rubi [A] time = 0.03, antiderivative size = 52, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.059, Rules used = {2218}

$$-\frac{(a+bx)^{m+1}\left(-(a+bx)^n\right)^{-\frac{m+1}{n}}\text{Gamma}\left(\frac{m+1}{n},-(a+bx)^n\right)}{bn}$$

Antiderivative was successfully verified.

```
[In] Int[E^(a + b*x)^n*(a + b*x)^m,x]
```

```
[Out] -(((a + b*x)^(1 + m)*Gamma[(1 + m)/n, -(a + b*x)^n])/(b*n*(-(a + b*x)^n)^((
1 + m)/n)))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int e^{(a+bx)^n}(a+bx)^m\,dx=-\frac{(a+bx)^{1+m}\left(-(a+bx)^n\right)^{-\frac{1+m}{n}}\Gamma\left(\frac{1+m}{n},-(a+bx)^n\right)}{bn}$$

Mathematica [A] time = 0.02, size = 52, normalized size = 1.00

$$-\frac{(a+bx)^{m+1}\left(-(a+bx)^n\right)^{-\frac{m+1}{n}}\Gamma\left(\frac{m+1}{n},-(a+bx)^n\right)}{bn}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a + b*x)^n*(a + b*x)^m,x]
```

```
[Out] -(((a + b*x)^(1 + m)*Gamma[(1 + m)/n, -(a + b*x)^n])/(b*n*(-(a + b*x)^n)^((
1 + m)/n)))
```

fricas [F] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left((bx+a)^m e^{\left((bx+a)^n\right)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)^n)*(b*x+a)^m,x, algorithm="fricas")
```

```
[Out] integral((b*x + a)^m*e^((b*x + a)^n), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (bx+a)^m e^{\left((bx+a)^n\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)^n)*(b*x+a)^m,x, algorithm="giac")
```

```
[Out] integrate((b*x + a)^m*e^((b*x + a)^n), x)
```

maple [F] time = 0.22, size = 0, normalized size = 0.00

$$\int (bx+a)^m \mathrm{e}^{(bx+a)^n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp((b*x+a)^n)*(b*x+a)^m,x)
```

```
[Out] int(exp((b*x+a)^n)*(b*x+a)^m,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (bx+a)^m e^{\left((bx+a)^n\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)^n)*(b*x+a)^m,x, algorithm="maxima")
```

```
[Out] integrate((b*x + a)^m*e^((b*x + a)^n), x)
```

mupad [B] time = 3.89, size = 77, normalized size = 1.48

$$\frac{\mathrm{e}^{\frac{(a+b\,x)^n}{2}}\,(a+b\,x)^{m+1}\,\mathrm{M}_{1-\frac{m+n+1}{2\,n},\frac{m+n+1}{2\,n}-\frac{1}{2}}\left((a+b\,x)^n\right)}{b\left((a+b\,x)^n\right)^{\frac{m+n+1}{2\,n}}\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp((a + b*x)^n)*(a + b*x)^m,x)
```

```
[Out] (exp((a + b*x)^n/2)*(a + b*x)^(m + 1)*whittakerM(1 - (m + n + 1)/(2*n), (m
+ n + 1)/(2*n) - 1/2, (a + b*x)^n))/(b*((a + b*x)^n)^((m + n + 1)/(2*n))*(m
 + 1))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (a+bx)^m\, e^{(a+bx)^n}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)**n)*(b*x+a)**m,x)
```

```
[Out] Integral((a + b*x)**m*exp((a + b*x)**n), x)
```

3.772 $\int f^{(a+bx)^n}(a+bx)^m\,dx$

Optimal. Leaf size=56

$$-\frac{(a+bx)^{m+1}\left(\log(f)\left(-(a+bx)^n\right)\right)^{-\frac{m+1}{n}}\Gamma\left(\frac{m+1}{n},-(a+bx)^n\log(f)\right)}{bn}$$

```
[Out] -(b*x+a)^(1+m)*GAMMA((1+m)/n,-(b*x+a)^n*ln(f))/b/n/((-(b*x+a)^n*ln(f))^((1+
m)/n))
```

Rubi [A] time = 0.03, antiderivative size = 56, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.059, Rules used = {2218}

$$-\frac{(a+bx)^{m+1}\left(\log(f)\left(-(a+bx)^n\right)\right)^{-\frac{m+1}{n}}\text{Gamma}\left(\frac{m+1}{n},\log(f)\left(-(a+bx)^n\right)\right)}{bn}$$

Antiderivative was successfully verified.

```
[In] Int[f^(a + b*x)^n*(a + b*x)^m,x]
```

```
[Out] -(((a + b*x)^(1 + m)*Gamma[(1 + m)/n, -((a + b*x)^n*Log[f])])/(b*n*(-((a +
b*x)^n*Log[f]))^((1 + m)/n)))
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rubi steps

$$\int f^{(a+bx)^n}(a+bx)^m\,dx=-\frac{(a+bx)^{1+m}\Gamma\left(\frac{1+m}{n},-(a+bx)^n\log(f)\right)\left(-(a+bx)^n\log(f)\right)^{-\frac{1+m}{n}}}{bn}$$

Mathematica [A] time = 0.01, size = 56, normalized size = 1.00

$$-\frac{(a+bx)^{m+1}\left(\log(f)\left(-(a+bx)^n\right)\right)^{-\frac{m+1}{n}}\Gamma\left(\frac{m+1}{n},-(a+bx)^n\log(f)\right)}{bn}$$

Antiderivative was successfully verified.

```
[In] Integrate[f^(a + b*x)^n*(a + b*x)^m,x]
```

```
[Out] -(((a + b*x)^(1 + m)*Gamma[(1 + m)/n, -((a + b*x)^n*Log[f])])/(b*n*(-((a + b*x)^n*Log[f]))^((1 + m)/n)))
```

fricas [F] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left((bx+a)^m f^{\left((bx+a)^n\right)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^((b*x+a)^n)*(b*x+a)^m,x, algorithm="fricas")
```

```
[Out] integral((b*x + a)^m*f^((b*x + a)^n), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (bx+a)^m f^{\left((bx+a)^n\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^((b*x+a)^n)*(b*x+a)^m,x, algorithm="giac")
```

```
[Out] integrate((b*x + a)^m*f^((b*x + a)^n), x)
```

maple [F] time = 0.25, size = 0, normalized size = 0.00

$$\int f^{(bx+a)^n} (bx+a)^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^((b*x+a)^n)*(b*x+a)^m,x)
```

```
[Out] int(f^((b*x+a)^n)*(b*x+a)^m,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (bx+a)^m f^{\left((bx+a)^n\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f^((b*x+a)^n)*(b*x+a)^m,x, algorithm="maxima")
```

```
[Out] integrate((b*x + a)^m*f^((b*x + a)^n), x)
```

mupad [B] time = 4.01, size = 94, normalized size = 1.68

$$\frac{f^{(a+b\,x)^n}\,\mathrm{e}^{-\frac{\ln(f)\,(a+b\,x)^n}{2}}\,(a+b\,x)^{m+1}\,\mathrm{M}_{1-\frac{m+n+1}{2\,n},\frac{m+n+1}{2\,n}-\frac{1}{2}}\left(\ln(f)\,(a+b\,x)^n\right)}{b\,(m+1)\,\left(\ln(f)\,(a+b\,x)^n\right)^{\frac{m+n+1}{2\,n}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(f^((a + b*x)^n)*(a + b*x)^m,x)
```

```
[Out] (f^((a + b*x)^n)*exp(-(log(f)*(a + b*x)^n)/2)*(a + b*x)^(m + 1)*whittakerM(
1 - (m + n + 1)/(2*n), (m + n + 1)/(2*n) - 1/2, log(f)*(a + b*x)^n))/(b*(m
+ 1)*(log(f)*(a + b*x)^n)^((m + n + 1)/(2*n)))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int f^{(a+bx)^n}\,(a+bx)^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(f**((b*x+a)**n)*(b*x+a)**m,x)
```

```
[Out] Integral(f**((a + b*x)**n)*(a + b*x)**m, x)
```

3.773 $\int e^{(a+bx)^3} x\,dx$

Optimal. Leaf size=80

$$\frac{a(a+bx)\Gamma\left(\frac{1}{3},-(a+bx)^3\right)}{3b^2\sqrt[3]{-(a+bx)^3}}-\frac{(a+bx)^2\Gamma\left(\frac{2}{3},-(a+bx)^3\right)}{3b^2\left(-(a+bx)^3\right)^{2/3}}$$

```
[Out] 1/3*a*(b*x+a)*GAMMA(1/3,-(b*x+a)^3)/b^2/(-(b*x+a)^3)^(1/3)-1/3*(b*x+a)^2*GA
MMA(2/3,-(b*x+a)^3)/b^2/(-(b*x+a)^3)^(2/3)
```

Rubi [A] time = 0.04, antiderivative size = 80, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {2226, 2208, 2218}

$$\frac{a(a+bx)\text{Gamma}\left(\frac{1}{3},-(a+bx)^3\right)}{3b^2\sqrt[3]{-(a+bx)^3}}-\frac{(a+bx)^2\text{Gamma}\left(\frac{2}{3},-(a+bx)^3\right)}{3b^2\left(-(a+bx)^3\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In] Int[E^(a + b*x)^3*x,x]
```

```
[Out] (a*(a + b*x)*Gamma[1/3, -(a + b*x)^3])/(3*b^2*(-(a + b*x)^3)^(1/3)) - ((a +
 b*x)^2*Gamma[2/3, -(a + b*x)^3])/(3*b^2*(-(a + b*x)^3)^(2/3))
```

Rule 2208

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_)), x_Symbol] :> -Simp[(F^a
*(c + d*x)*Gamma[1/n, -(b*(c + d*x)^n*Log[F])])/(d*n*(-(b*(c + d*x)^n*Log[F
]))^(1/n)), x] /; FreeQ[{F, a, b, c, d, n}, x] &&  !IntegerQ[2/n]
```

Rule 2218

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> -Simp[(F^a*(e + f*x)^(m + 1)*Gamma[(m + 1)/n, -(b*(c + d*x
)^n*Log[F])])/(f*n*(-(b*(c + d*x)^n*Log[F]))^((m + 1)/n)), x] /; FreeQ[{F,
a, b, c, d, e, f, m, n}, x] && EqQ[d*e - c*f, 0]
```

Rule 2226

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^(n_))*(u_), x_Symbol] :> Int[E
xpandLinearProduct[F^(a + b*(c + d*x)^n), u, c, d, x], x] /; FreeQ[{F, a, b
, c, d, n}, x] && PolynomialQ[u, x]
```

Rubi steps

$$\int e^{(a+bx)^3}x\,dx = \int\left(-\frac{ae^{(a+bx)^3}}{b}+\frac{e^{(a+bx)^3}(a+bx)}{b}\right)dx$$
$$=\frac{\int e^{(a+bx)^3}(a+bx)\,dx}{b}-\frac{a\int e^{(a+bx)^3}\,dx}{b}$$
$$=\frac{a(a+bx)\Gamma\left(\frac{1}{3},-(a+bx)^3\right)}{3b^2\sqrt[3]{-(a+bx)^3}}-\frac{(a+bx)^2\Gamma\left(\frac{2}{3},-(a+bx)^3\right)}{3b^2\left(-(a+bx)^3\right)^{2/3}}$$

Mathematica [A] time = 0.04, size = 74, normalized size = 0.92

$$\frac{(a+bx)\left(a\sqrt[3]{-(a+bx)^3}\,\Gamma\left(\frac{1}{3},-(a+bx)^3\right)-(a+bx)\Gamma\left(\frac{2}{3},-(a+bx)^3\right)\right)}{3b^2\left(-(a+bx)^3\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[E^(a + b*x)^3*x,x]
```

```
[Out] ((a + b*x)*(a*(-(a + b*x)^3)^(1/3)*Gamma[1/3, -(a + b*x)^3] - (a + b*x)*Gam
ma[2/3, -(a + b*x)^3]))/(3*b^2*(-(a + b*x)^3)^(2/3))
```

fricas [A] time = 0.48, size = 89, normalized size = 1.11

$$-\frac{\left(-b^3\right)^{\frac{2}{3}}a\Gamma\left(\frac{1}{3},-b^3x^3-3\,ab^2x^2-3\,a^2bx-a^3\right)-\left(-b^3\right)^{\frac{1}{3}}b\Gamma\left(\frac{2}{3},-b^3x^3-3\,ab^2x^2-3\,a^2bx-a^3\right)}{3\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)^3)*x,x, algorithm="fricas")
```

```
[Out] -1/3*((-b^3)^(2/3)*a*gamma(1/3, -b^3*x^3 - 3*a*b^2*x^2 - 3*a^2*b*x - a^3) -
 (-b^3)^(1/3)*b*gamma(2/3, -b^3*x^3 - 3*a*b^2*x^2 - 3*a^2*b*x - a^3))/b^4
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int xe^{\left((bx+a)^3\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)^3)*x,x, algorithm="giac")
[Out] integrate(x*e^((b*x + a)^3), x)
```

maple [F] time = 0.06, size = 0, normalized size = 0.00

$$\int x\,\mathrm{e}^{(bx+a)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp((b*x+a)^3)*x,x)
[Out] int(exp((b*x+a)^3)*x,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int xe^{\left((bx+a)^3\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)^3)*x,x, algorithm="maxima")
[Out] integrate(x*e^((b*x + a)^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int x\,\mathrm{e}^{(a+b\,x)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*exp((a + b*x)^3),x)
[Out] int(x*exp((a + b*x)^3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$e^{a^3}\int xe^{b^3x^3}e^{3ab^2x^2}e^{3a^2bx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp((b*x+a)**3)*x,x)
[Out] exp(a**3)*Integral(x*exp(b**3*x**3)*exp(3*a*b**2*x**2)*exp(3*a**2*b*x), x)
```

3.774 $\int \frac{5x^2+3\sqrt[3]{e^x+x}+e^x\left(3x+2x^2\right)}{x\sqrt[3]{e^x+x}}\,dx$

Optimal. Leaf size=17

$$3\,(x+e^x)^{2/3}\,x+3\log(x)$$

```
[Out] 3*x*(x+exp(x))^(2/3)+3*ln(x)
```

Rubi [A] time = 0.64, antiderivative size = 17, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 4, integrand size = 43, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.093, Rules used = {6742, 2261, 2273, 2262}

$$3\,(x+e^x)^{2/3}\,x+3\log(x)$$

Antiderivative was successfully verified.

```
[In] Int[(5*x^2 + 3*(E^x + x)^(1/3) + E^x*(3*x + 2*x^2))/(x*(E^x + x)^(1/3)),x]
```

```
[Out] 3*x*(E^x + x)^(2/3) + 3*Log[x]
```

Rule 2261

```
Int[(F_)^((e_.)*((c_.) + (d_.)*(x_)))*((b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_
))) + (a_.)*(x_)^(n_.))^(p_.), x_Symbol] :> Simp[(a*x^n + b*F^(e*(c + d*x))
)^(p + 1)/(b*d*e*(p + 1)*Log[F]), x] - Dist[(a*n)/(b*d*e*Log[F]), Int[x^(n
- 1)*(a*x^n + b*F^(e*(c + d*x)))^p, x], x] /; FreeQ[{F, a, b, c, d, e, n, p
}, x] && NeQ[p, -1]
```

Rule 2262

```
Int[(F_)^((e_.)*((c_.) + (d_.)*(x_)))*(x_)^(m_.)*((b_.)*(F_)^((e_.)*((c_.)
+ (d_.)*(x_))) + (a_.)*(x_)^(n_.))^(p_.), x_Symbol] :> Simp[(x^m*(a*x^n + b
*F^(e*(c + d*x)))^(p + 1))/(b*d*e*(p + 1)*Log[F]), x] + (-Dist[m/(b*d*e*(p
+ 1)*Log[F]), Int[x^(m - 1)*(a*x^n + b*F^(e*(c + d*x)))^(p + 1), x], x] - D
ist[(a*n)/(b*d*e*Log[F]), Int[x^(m + n - 1)*(a*x^n + b*F^(e*(c + d*x)))^p,
x], x]) /; FreeQ[{F, a, b, c, d, e, m, n, p}, x] && NeQ[p, -1]
```

Rule 2273

```
Int[(x_)^(m_.)*(E^(x_) + (x_)^(m_.))^(n_), x_Symbol] :> -Simp[(E^x + x^m)^(
n + 1)/(n + 1), x] + (Dist[m, Int[x^(m - 1)*(E^x + x^m)^n, x], x] + Int[(E^
x + x^m)^(n + 1), x]) /; RationalQ[m, n] && GtQ[m, 0] && LtQ[n, 0] && NeQ[n
, -1]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int \frac{5x^2+3\sqrt[3]{e^x+x}+e^x\left(3x+2x^2\right)}{x\sqrt[3]{e^x+x}}\,dx=\int\left(\frac{3}{x}+\frac{3e^x}{\sqrt[3]{e^x+x}}+\frac{(5+2e^x)\,x}{\sqrt[3]{e^x+x}}\right)dx$$
$$=3\log(x)+3\int\frac{e^x}{\sqrt[3]{e^x+x}}\,dx+\int\frac{(5+2e^x)\,x}{\sqrt[3]{e^x+x}}\,dx$$
$$=\frac{9}{2}\left(e^x+x\right)^{2/3}+3\log(x)-3\int\frac{1}{\sqrt[3]{e^x+x}}\,dx+\int\left(\frac{5x}{\sqrt[3]{e^x+x}}+\frac{2e^xx}{\sqrt[3]{e^x+x}}\right)$$
$$=\frac{9}{2}\left(e^x+x\right)^{2/3}+3\log(x)+2\int\frac{e^xx}{\sqrt[3]{e^x+x}}\,dx-3\int\frac{1}{\sqrt[3]{e^x+x}}\,dx+5\int$$
$$=-3\left(e^x+x\right)^{2/3}+3x\left(e^x+x\right)^{2/3}+3\log(x)-2\int\frac{x}{\sqrt[3]{e^x+x}}\,dx-3\int\frac{1}{\sqrt[3]{e^x+}}$$
$$=3x\left(e^x+x\right)^{2/3}+3\log(x)-2\int\frac{1}{\sqrt[3]{e^x+x}}\,dx-2\int\left(e^x+x\right)^{2/3}\,dx-3\int$$

Mathematica [A] time = 0.24, size = 17, normalized size = 1.00

$$3\left(x+e^x\right)^{2/3}x+3\log(x)$$

Antiderivative was successfully verified.

```
[In] Integrate[(5*x^2 + 3*(E^x + x)^(1/3) + E^x*(3*x + 2*x^2))/(x*(E^x + x)^(1/3
)),x]
```

```
[Out] 3*x*(E^x + x)^(2/3) + 3*Log[x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2+3*(x+exp(x))^(1/3)+exp(x)*(2*x^2+3*x))/x/(x+exp(x))^(1/3),
x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (has polynomial part)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{5\,x^2 + \left(2\,x^2 + 3\,x\right)e^x + 3\,(x + e^x)^{\frac{1}{3}}}{(x + e^x)^{\frac{1}{3}}\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2+3*(x+exp(x))^(1/3)+exp(x)*(2*x^2+3*x))/x/(x+exp(x))^(1/3),
x, algorithm="giac")
```

```
[Out] integrate((5*x^2 + (2*x^2 + 3*x)*e^x + 3*(x + e^x)^(1/3))/((x + e^x)^(1/3)*
x), x)
```

maple [F] time = 0.04, size = 0, normalized size = 0.00

$$\int \frac{5x^2 + \left(2x^2 + 3x\right)\mathrm{e}^x + 3\,(x + \mathrm{e}^x)^{\frac{1}{3}}}{(x + \mathrm{e}^x)^{\frac{1}{3}}\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((5*x^2+3*(x+exp(x))^(1/3)+exp(x)*(2*x^2+3*x))/x/(x+exp(x))^(1/3),x)
```

```
[Out] int((5*x^2+3*(x+exp(x))^(1/3)+exp(x)*(2*x^2+3*x))/x/(x+exp(x))^(1/3),x)
```

maxima [A] time = 0.90, size = 21, normalized size = 1.24

$$\frac{3\left(x^2 + xe^x\right)}{(x + e^x)^{\frac{1}{3}}} + 3\,\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2+3*(x+exp(x))^(1/3)+exp(x)*(2*x^2+3*x))/x/(x+exp(x))^(1/3),
x, algorithm="maxima")
```

```
[Out] 3*(x^2 + x*e^x)/(x + e^x)^(1/3) + 3*log(x)
```

mupad [B] time = 3.67, size = 14, normalized size = 0.82

$$3\,\ln(x) + 3\,x\,(x + \mathrm{e}^x)^{2/3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((3*(x + exp(x))^(1/3) + exp(x)*(3*x + 2*x^2) + 5*x^2)/(x*(x + exp(x))^(
1/3)),x)
```

```
[Out] 3*log(x) + 3*x*(x + exp(x))^(2/3)
```

sympy [F]   time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{2x^2e^x + 5x^2 + 3xe^x + 3\sqrt[3]{x + e^x}}{x\sqrt[3]{x + e^x}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x**2+3*(exp(x)+x)**(1/3)+exp(x)*(2*x**2+3*x))/x/(exp(x)+x)**(1
/3),x)
```

```
[Out] Integral((2*x**2*exp(x) + 5*x**2 + 3*x*exp(x) + 3*(x + exp(x))**(1/3))/(x*(
x + exp(x))**(1/3)), x)
```

Chapter 4

Listing of Grading functions

The following are the current version of the grading functions used for grading the quality of the antiderivative with reference to the optimal antiderivative included in the test suite.

There is a version for Maple and for Mathematica/Rubi. There is a version for grading Sympy and version for use with Sagemath.

The following are links to the current source code.

The following are the listings of source code of the grading functions.

4.0.1 Mathematica and Rubi grading function

```
(* Original version thanks to Albert Rich emailed on 03/21/2017 *)
(* ::Package:: *)

(* ::Subsection:: *)
(*GradeAntiderivative[result,optimal]*)


(* ::Text:: *)
(*If result and optimal are mathematical expressions, *)
(*         GradeAntiderivative[result,optimal] returns*)
(*  "F" if the result fails to integrate an expression that*)
(*      is integrable*)
(*  "C" if result involves higher level functions than necessary*)
(*  "B" if result is more than twice the size of the optimal*)
(*      antiderivative*)
(*  "A" if result can be considered optimal*)


GradeAntiderivative[result_,optimal_] :=
  If[ExpnType[result]<=ExpnType[optimal],
```

```
    If[FreeQ[result,Complex] || Not[FreeQ[optimal,Complex]],
      If[LeafCount[result]<=2*LeafCount[optimal],
        "A",
      "B"],
    "C"],
  If[FreeQ[result,Integrate] && FreeQ[result,Int],
    "C",
  "F"]]


(* ::Text:: *)
(*The following summarizes the type number assigned an *)
(*expression based on the functions it involves*)
(*1 = rational function*)
(*2 = algebraic function*)
(*3 = elementary function*)
(*4 = special function*)
(*5 = hyperpergeometric function*)
(*6 = appell function*)
(*7 = rootsum function*)
(*8 = integrate function*)
(*9 = unknown function*)


ExpnType[expn_] :=
  If[AtomQ[expn],
    1,
  If[ListQ[expn],
    Max[Map[ExpnType,expn]],
  If[Head[expn]===Power,
    If[IntegerQ[expn[[2]]],
      ExpnType[expn[[1]]],
    If[Head[expn[[2]]]===Rational,
      If[IntegerQ[expn[[1]]] || Head[expn[[1]]]===Rational,
        1,
      Max[ExpnType[expn[[1]]],2]],
    Max[ExpnType[expn[[1]]],ExpnType[expn[[2]]],3]]],
  If[Head[expn]===Plus || Head[expn]===Times,
    Max[ExpnType[First[expn]],ExpnType[Rest[expn]]],
  If[ElementaryFunctionQ[Head[expn]],
    Max[3,ExpnType[expn[[1]]]],
  If[SpecialFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],4]],
  If[HypergeometricFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],5]],
  If[AppellFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],6]],
```

```
  If[Head[expn]===RootSum,
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],7]],
  If[Head[expn]===Integrate || Head[expn]===Int,
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],8]],
  9]]]]]]]]]]


ElementaryFunctionQ[func_] :=
  MemberQ[{
        Exp,Log,
        Sin,Cos,Tan,Cot,Sec,Csc,
        ArcSin,ArcCos,ArcTan,ArcCot,ArcSec,ArcCsc,
        Sinh,Cosh,Tanh,Coth,Sech,Csch,
        ArcSinh,ArcCosh,ArcTanh,ArcCoth,ArcSech,ArcCsch
},func]


SpecialFunctionQ[func_] :=
  MemberQ[{
        Erf, Erfc, Erfi,
        FresnelS, FresnelC,
        ExpIntegralE, ExpIntegralEi, LogIntegral,
        SinIntegral, CosIntegral, SinhIntegral, CoshIntegral,
        Gamma, LogGamma, PolyGamma,
        Zeta, PolyLog, ProductLog,
        EllipticF, EllipticE, EllipticPi
},func]


HypergeometricFunctionQ[func_] :=
  MemberQ[{Hypergeometric1F1,Hypergeometric2F1,HypergeometricPFQ},func]


AppellFunctionQ[func_] :=
  MemberQ[{AppellF1},func]
```

4.0.2 Maple grading function

```
# File: GradeAntiderivative.mpl
# Original version thanks to Albert Rich emailed on 03/21/2017

#Nasser 03/22/2017  Use Maple leaf count instead since buildin
#Nasser 03/23/2017  missing 'ln' for ElementaryFunctionQ added
#Nasser 03/24/2017  corrected the check for complex result
#Nasser 10/27/2017  check for leafsize and do not call ExpnType()
#                   if leaf size is "too large". Set at 500,000
```

```
#Nasser 12/22/2019  Added debug flag, added 'dilog' to special functions
#                   see problem 156, file Apostol_Problems

GradeAntiderivative := proc(result,optimal)
local leaf_count_result, leaf_count_optimal,ExpnType_result,ExpnType_optimal,
   debug:=false;

      leaf_count_result:=leafcount(result);
      #do NOT call ExpnType() if leaf size is too large. Recursion problem
      if leaf_count_result > 500000 then
          return "B";
      fi;

      leaf_count_optimal:=leafcount(optimal);

      ExpnType_result:=ExpnType(result);
      ExpnType_optimal:=ExpnType(optimal);

      if debug then
         print("ExpnType_result",ExpnType_result," ExpnType_optimal=",
   ExpnType_optimal);
      fi;

# If result and optimal are mathematical expressions,
#  GradeAntiderivative[result,optimal] returns
#   "F" if the result fails to integrate an expression that
#       is integrable
#   "C" if result involves higher level functions than necessary
#   "B" if result is more than twice the size of the optimal
#       antiderivative
#   "A" if result can be considered optimal

  #This check below actually is not needed, since I only
  #call this grading only for passed integrals. i.e. I check
  #for "F" before calling this. But no harm of keeping it here.
  #just in case.


  if not type(result,freeof('int')) then
     return "F";
  end if;


  if ExpnType_result<=ExpnType_optimal then
      if debug then
           print("ExpnType_result<=ExpnType_optimal");
      fi;
```

```
      if is_contains_complex(result) then
         if is_contains_complex(optimal) then
            if debug then
               print("both result and optimal complex");
            fi;
            #both result and optimal complex
            if leaf_count_result<=2*leaf_count_optimal then
               return "A";
            else
               return "B";
            end if
         else #result contains complex but optimal is not
            if debug then
               print("result contains complex but optimal is not");
            fi;
            return "C";
         end if
      else # result do not contain complex
           # this assumes optimal do not as well
           if debug then
               print("result do not contain complex, this assumes optimal do not
     as well");
           fi;
           if leaf_count_result<=2*leaf_count_optimal then
              if debug then
                 print("leaf_count_result<=2*leaf_count_optimal");
              fi;
              return "A";
           else
              if debug then
                 print("leaf_count_result>2*leaf_count_optimal");
              fi;
              return "B";
           end if
      end if
  else #ExpnType(result) > ExpnType(optimal)
      if debug then
         print("ExpnType(result) > ExpnType(optimal)");
      fi;
      return "C";
  end if

end proc:

#
# is_contains_complex(result)
# takes expressions and returns true if it contains "I" else false
```

```
#
#Nasser 032417
is_contains_complex:= proc(expression)
  return (has(expression,I));
end proc:

# The following summarizes the type number assigned an expression
# based on the functions it involves
# 1 = rational function
# 2 = algebraic function
# 3 = elementary function
# 4 = special function
# 5 = hyperpergeometric function
# 6 = appell function
# 7 = rootsum function
# 8 = integrate function
# 9 = unknown function

ExpnType := proc(expn)
  if type(expn,'atomic') then
    1
  elif type(expn,'list') then
    apply(max,map(ExpnType,expn))
  elif type(expn,'sqrt') then
    if type(op(1,expn),'rational') then
       1
    else
       max(2,ExpnType(op(1,expn)))
    end if
  elif type(expn,'`^`') then
    if type(op(2,expn),'integer') then
      ExpnType(op(1,expn))
    elif type(op(2,expn),'rational') then
      if type(op(1,expn),'rational') then
         1
      else
         max(2,ExpnType(op(1,expn)))
      end if
    else
         max(3,ExpnType(op(1,expn)),ExpnType(op(2,expn)))
    end if
  elif type(expn,'`+`') or type(expn,'`*`') then
    max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
  elif ElementaryFunctionQ(op(0,expn)) then
    max(3,ExpnType(op(1,expn)))
  elif SpecialFunctionQ(op(0,expn)) then
    max(4,apply(max,map(ExpnType,[op(expn)])))
```

```
  elif HypergeometricFunctionQ(op(0,expn)) then
    max(5,apply(max,map(ExpnType,[op(expn)])))
  elif AppellFunctionQ(op(0,expn)) then
    max(6,apply(max,map(ExpnType,[op(expn)])))
  elif op(0,expn)='int' then
    max(8,apply(max,map(ExpnType,[op(expn)]))) else
  9
  end if
end proc:


ElementaryFunctionQ := proc(func)
  member(func,[
        exp,log,ln,
        sin,cos,tan,cot,sec,csc,
        arcsin,arccos,arctan,arccot,arcsec,arccsc,
        sinh,cosh,tanh,coth,sech,csch,
        arcsinh,arccosh,arctanh,arccoth,arcsech,arccsch])
end proc:

SpecialFunctionQ := proc(func)
  member(func,[
        erf,erfc,erfi,
        FresnelS,FresnelC,
        Ei,Ei,Li,Si,Ci,Shi,Chi,
        GAMMA,lnGAMMA,Psi,Zeta,polylog,dilog,LambertW,
        EllipticF,EllipticE,EllipticPi])
end proc:

HypergeometricFunctionQ := proc(func)
  member(func,[Hypergeometric1F1,hypergeom,HypergeometricPFQ])
end proc:

AppellFunctionQ := proc(func)
  member(func,[AppellF1])
end proc:

# u is a sum or product.  rest(u) returns all but the
# first term or factor of u.
rest := proc(u) local v;
  if nops(u)=2 then
     op(2,u)
  else
     apply(op(0,u),op(2..nops(u),u))
  end if
end proc:
```

```
#leafcount(u) returns the number of nodes in u.
#Nasser 3/23/17  Replaced by build-in leafCount from package in Maple
leafcount := proc(u)
   MmaTranslator[Mma][LeafCount](u);
end proc:
```

4.0.3 Sympy grading function

```
#Dec 24, 2019. Nasser M. Abbasi:
#              Port of original Maple grading function by
#              Albert Rich to use with Sympy/Python
#Dec 27, 2019  Nasser. Added `RootSum`. See problem 177, Timofeev file
#              added 'exp_polar'
from sympy import *

def leaf_count(expr):
    #sympy do not have leaf count function. This is approximation
    return round(1.7*count_ops(expr))

def is_sqrt(expr):
    if isinstance(expr,Pow):
        if expr.args[1] == Rational(1,2):
            return True
        else:
            return False
    else:
        return False

def is_elementary_function(func):
    return func in [exp,log,ln,sin,cos,tan,cot,sec,csc,
            asin,acos,atan,acot,asec,acsc,sinh,cosh,tanh,coth,sech,csch,
            asinh,acosh,atanh,acoth,asech,acsch
        ]

def is_special_function(func):
    return func in [ erf,erfc,erfi,
             fresnels,fresnelc,Ei,Ei,Li,Si,Ci,Shi,Chi,
             gamma,loggamma,digamma,zeta,polylog,LambertW,
             elliptic_f,elliptic_e,elliptic_pi,exp_polar
         ]

def is_hypergeometric_function(func):
    return func in [hyper]

def is_appell_function(func):
    return func in [appellf1]
```

```
def is_atom(expn):
    try:
        if expn.isAtom or isinstance(expn,int) or isinstance(expn,float):
           return True
        else:
           return False

    except AttributeError as error:
        return False

def expnType(expn):
    debug=False
    if debug:
        print("expn=",expn,"type(expn)=",type(expn))

    if is_atom(expn):
       return 1
    elif isinstance(expn,list):
        return max(map(expnType, expn))   #apply(max,map(ExpnType,expn))
    elif  is_sqrt(expn):
        if isinstance(expn.args[0],Rational): #type(op(1,expn),'rational')
            return 1
        else:
            return max(2,expnType(expn.args[0]))  #max(2,ExpnType(op(1,expn)))
    elif isinstance(expn,Pow):   #type(expn,'`^`')
        if isinstance(expn.args[1],Integer):  #type(op(2,expn),'integer')
            return expnType(expn.args[0])   #ExpnType(op(1,expn))
        elif isinstance(expn.args[1],Rational):  #type(op(2,expn),'rational')
            if isinstance(expn.args[0],Rational): #type(op(1,expn),'rational')
                return 1
            else:
                return max(2,expnType(expn.args[0]))  #max(2,ExpnType(op(1,expn)
   ))
        else:
            return max(3,expnType(expn.args[0]),expnType(expn.args[1])) #max(3,
   ExpnType(op(1,expn)),ExpnType(op(2,expn)))
    elif isinstance(expn,Add) or isinstance(expn,Mul): #type(expn,'`+`') or type
   (expn,'`*`')
        m1 = expnType(expn.args[0])
        m2 = expnType(list(expn.args[1:]))
        return max(m1,m2)  #max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
    elif is_elementary_function(expn.func):  #ElementaryFunctionQ(op(0,expn))
        return max(3,expnType(expn.args[0]))  #max(3,ExpnType(op(1,expn)))
    elif is_special_function(expn.func): #SpecialFunctionQ(op(0,expn))
        m1 = max(map(expnType, list(expn.args)))
        return max(4,m1)   #max(4,apply(max,map(ExpnType,[op(expn)])))
```

```
    elif is_hypergeometric_function(expn.func): #HypergeometricFunctionQ(op(0,
   expn))
        m1 = max(map(expnType, list(expn.args)))
        return max(5,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    elif is_appell_function(expn.func):
        m1 = max(map(expnType, list(expn.args)))
        return max(6,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    elif isinstance(expn,RootSum):
        m1 = max(map(expnType, list(expn.args))) #Apply[Max,Append[Map[ExpnType,
   Apply[List,expn]],7]],
        return max(7,m1)
    elif str(expn).find("Integral") != -1:
        m1 = max(map(expnType, list(expn.args)))
        return max(8,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    else:
        return 9

#main function
def grade_antiderivative(result,optimal):

    leaf_count_result  = leaf_count(result)
    leaf_count_optimal = leaf_count(optimal)

    expnType_result  = expnType(result)
    expnType_optimal = expnType(optimal)

    if str(result).find("Integral") != -1:
        return "F"

    if expnType_result <= expnType_optimal:
        if result.has(I):
            if optimal.has(I): #both result and optimal complex
                if leaf_count_result <= 2*leaf_count_optimal:
                    return "A"
                else:
                    return "B"
            else: #result contains complex but optimal is not
                return "C"
        else: # result do not contain complex, this assumes optimal do not as
   well
            if leaf_count_result <= 2*leaf_count_optimal:
                return "A"
            else:
                return "B"
    else:
        return "C"
```

4.0.4 SageMath grading function

```
#Dec 24, 2019. Nasser: Ported original Maple grading function by
#              Albert Rich to use with Sagemath. This is used to
#              grade Fricas, Giac and Maxima results.
#Dec 24, 2019. Nasser: Added 'exp_integral_e' and 'sng', 'sin_integral'
#              'arctan2','floor','abs','log_integral'

from sage.all import *
from sage.symbolic.operators import add_vararg, mul_vararg

debug=False;

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

def is_sqrt(expr):
    if expr.operator() == operator.pow:   #isinstance(expr,Pow):
        if expr.operands()[1]==1/2: #expr.args[1] == Rational(1,2):
            if debug: print ("expr is sqrt")
            return True
        else:
            return False
    else:
        return False

def is_elementary_function(func):
    debug=False
    m = func.name() in ['exp','log','ln',
            'sin','cos','tan','cot','sec','csc',
            'arcsin','arccos','arctan','arccot','arcsec','arccsc',
            'sinh','cosh','tanh','coth','sech','csch',
            'arcsinh','arccosh','arctanh','arccoth','arcsech','arccsch','sgn',
        'arctan2','floor','abs'
        ]
    if debug:
        if m:
```

```
            print ("func ", func , " is elementary_function")
        else:
            print ("func ", func , " is NOT elementary_function")


    return m

def is_special_function(func):
    debug=False
    if debug: print ("type(func)=", type(func))

    m= func.name() in ['erf','erfc','erfi','fresnel_sin','fresnel_cos','Ei',
           'Ei','Li','Si','sin_integral','Ci','cos_integral','Shi','
   sinh_integral'
           'Chi','cosh_integral','gamma','log_gamma','psi,zeta',
           'polylog','lambert_w','elliptic_f','elliptic_e',
           'elliptic_pi','exp_integral_e','log_integral']

    if debug:
        print ("m=",m)
        if m:
            print ("func ", func ," is special_function")
        else:
            print ("func ", func ," is NOT special_function")


    return m


def is_hypergeometric_function(func):
    return func.name() in ['hypergeometric','hypergeometric_M','hypergeometric_U
   ']

def is_appell_function(func):
    return func.name() in ['hypergeometric']   #[appellf1] can't find this in
   sagemath

def is_atom(expn):

    debug=False
    if debug: print ("Enter is_atom")


    #thanks to answer at https://ask.sagemath.org/question/49179/what-is-
   sagemath-equivalent-to-atomic-type-in-maple/
    try:
        if expn.parent() is SR:
```

```
            return expn.operator() is None
        if expn.parent() in (ZZ, QQ, AA, QQbar):
            return expn in expn.parent() # Should always return True
        if hasattr(expn.parent(),"base_ring") and hasattr(expn.parent(),"gens"):
            return expn in expn.parent().base_ring() or expn in expn.parent().
    gens()
        return False

    except AttributeError as error:
        return False


def expnType(expn):

    if debug:
        print (">>>>>Enter expnType, expn=", expn)
        print (">>>>>is_atom(expn)=", is_atom(expn))

    if is_atom(expn):
        return 1
    elif type(expn)==list:   #isinstance(expn,list):
        return max(map(expnType, expn))   #apply(max,map(ExpnType,expn))
    elif  is_sqrt(expn):
        if  type(expn.operands()[0])==Rational: #type(isinstance(expn.args[0],
    Rational):
            return 1
        else:
            return max(2,expnType(expn.operands()[0]))  #max(2,expnType(expn.
    args[0]))
    elif expn.operator() == operator.pow:   #isinstance(expn,Pow)
        if type(expn.operands()[1])==Integer:  #isinstance(expn.args[1],Integer)
            return expnType(expn.operands()[0])   #expnType(expn.args[0])
        elif type(expn.operands()[1])==Rational:  #isinstance(expn.args[1],
    Rational)
            if type(expn.operands()[0])==Rational: #isinstance(expn.args[0],
    Rational)
                return 1
            else:
                return max(2,expnType(expn.operands()[0]))  #max(2,expnType(expn.
    args[0]))
        else:
            return max(3,expnType(expn.operands()[0]),expnType(expn.operands()
    [1])) #max(3,expnType(expn.operands()[0]),expnType(expn.operands()[1]))
    elif expn.operator() == add_vararg or expn.operator() == mul_vararg: #
    isinstance(expn,Add) or isinstance(expn,Mul)
        m1 = expnType(expn.operands()[0]) #expnType(expn.args[0])
        m2 = expnType(expn.operands()[1:]) #expnType(list(expn.args[1:]))
```

```
        return max(m1,m2)  #max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
    elif is_elementary_function(expn.operator()):  #is_elementary_function(expn.
   func)
        return max(3,expnType(expn.operands()[0]))
    elif is_special_function(expn.operator()): #is_special_function(expn.func)
        m1 = max(map(expnType, expn.operands()))      #max(map(expnType, list(
   expn.args)))
        return max(4,m1)   #max(4,m1)
    elif is_hypergeometric_function(expn.operator()): #
   is_hypergeometric_function(expn.func)
        m1 = max(map(expnType, expn.operands()))       #max(map(expnType, list(
   expn.args)))
        return max(5,m1)   #max(5,m1)
    elif is_appell_function(expn.operator()):
        m1 = max(map(expnType, expn.operands()))       #max(map(expnType, list(
   expn.args)))
        return max(6,m1)   #max(6,m1)
    elif str(expn).find("Integral") != -1: #this will never happen, since it
                #is checked before calling the grading function that is passed.
                #but kept it here.
        m1 = max(map(expnType, expn.operands()))       #max(map(expnType, list(
   expn.args)))
        return max(8,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    else:
        return 9

#main function
def grade_antiderivative(result,optimal):

    if debug: print ("Enter grade_antiderivative for sagemath")

    leaf_count_result  = tree_size(result) #leaf_count(result)
    leaf_count_optimal = tree_size(optimal) #leaf_count(optimal)

    if debug: print ("leaf_count_result=", leaf_count_result, "
   leaf_count_optimal=",leaf_count_optimal)


    expnType_result  = expnType(result)
    expnType_optimal = expnType(optimal)

    if debug: print ("expnType_result=", expnType_result, "expnType_optimal=",
   expnType_optimal)

    if expnType_result <= expnType_optimal:
        if result.has(I):
            if optimal.has(I): #both result and optimal complex
```

```
            if leaf_count_result <= 2*leaf_count_optimal:
                return "A"
            else:
                return "B"
        else: #result contains complex but optimal is not
            return "C"
    else: # result do not contain complex, this assumes optimal do not as
well
        if leaf_count_result <= 2*leaf_count_optimal:
            return "A"
        else:
            return "B"
else:
    return "C"
```